



International Seminar of  
Sport Culture and Achievement

# ISSCA 2014 PROCEEDINGS

*“Global Issues of Sport Science &  
Sport Technology Development”*



Diterbitkan Oleh:  
**Fakultas Ilmu Keolahragaan**  
Universitas Negeri Yogyakarta



**International Seminar of Sport Culture and Achievement**  
*“Global Issues of Sport Science & Sport Technology Development”*

**Proceedings**

**Publisher**

Faculty of Sport Sciences  
Yogyakarta State University

**Reviewer**

Dr. Lim Peng Han  
Dr. Gunathevan A/L Elumalai  
Dr. Achara Soachalerm  
Dr. Panggung Sutapa  
Dr. Siswantoyo  
Erwin Setyo Kriswanto, M.Kes.  
Bambang Priyonoadi, M.Kes.

**Editor**

Saryono, M.Or.  
Soni Nopembri, M.Pd.  
Nur Sita Utami, M.Or.  
Satya Perdana, S.S.

**Design & Lay Out**

Sugeng Setia Nugroho, A.Md.

**Secretariat:**

Yogyakarta State University, Indonesia Telp: +62274 550307  
Email: [issca\\_2014@uny.ac.id](mailto:issca_2014@uny.ac.id) - Website: [seminar.uny.ac.id/issca2014](http://seminar.uny.ac.id/issca2014)

The paper published in the proceeding is not necessarily a reflection of the attitude or opinion of the editor and executive, editor, expert editors and the responsibility for the contents or effect of the writing, still lies on the author.

**Article published in the proceeding is considered valid  
by the certificate included in the presentation.**



International Seminar of  
Sport Culture and Achievement

# ISSCA 2014 PROCEEDINGS

*“Global Issues of Sport Science &  
Sport Technology Development”*



*Diterbitkan Oleh:*

**Fakultas Ilmu Keolahragaan**  
Universitas Negeri Yogyakarta

**24 April 2014**

## Preface

### **Salam Olahraga!**

Praise and be grateful to the Lord, so that this proceeding can be issued. The International Seminar of Sport Culture and Achievement with "Global Issues of Sport Science & Technology Sport Development" theme is held on 23rd- 24th April 2014 at Yogyakarta State University Hotel. The seminar is conducted by Faculty of Sport Science, Yogyakarta State University.

The seminar was conducted in order to enliven the 50th anniversary of Yogyakarta State University. The Seminar aims at revealing any growing sport potentials and recent worldwide research results. There are three pillars of sport: recreational sports, physical education/ sports pedagogy, and elite sport that in common have one goal to form characters and support achievement.

Hopefully, the publication of this proceeding can bring benefits to the participants in particular and readers in general. Final words for all those who have helped this seminar, we thank you.



**Dean of Faculty of Sport Science**  
Yogyakarta State University,

**Drs. Rumpis Agus Sudarko, M.S.**



## Preface

*Assalamualaikum Warrah Matullahi Wabarakatuh*

The honorable speakers, Prof. Dr. Djoko Pekik Irianto, M.Kes. AIFO (Deputy of Achievement Improvement of Sport and Youth Ministry), Dr. Wayne Cotton (Australia), Dr. Jose Vicente Garcia Jimenez (Spain), Dr. Achara Soachalerm (Thailand), Dr. Lim Peng Han (Singapore), and Dr. Gunathevan A/L Elmulai (Malaysia). The distinguished guests.

First of all, on behalf of the committee of the International Seminar of Sport Culture and Achievement, let me express great thank to God Allah SWT who gives us opportunity and health, so that we can join this international seminar on sport culture and achievement. It is my pleasure to welcome you to the International Seminar of Sport Culture and Achievement in Faculty of Sport Science Yogyakarta State University.

The international seminar is in order to celebrate the 50th anniversary of Yogyakarta State University. In this opportunity, we invite five speakers from five countries; they are from Spain, Australia, Thailand, Singapore, and Malaysia. The participants of the seminar are 250 participants.

Finally, allow me to express my gratitude to all audiences, especially the honorable speakers and the distinguished guests for paying attention to this seminar. I hope that the seminar will run well and be successful.

Thank you very much.

*Wassalamualaikum Warrahmatullahi Wabarakatuh*

Yogyakarta, 24<sup>th</sup> April 2014  
**Chairman of ISSCA,**  
  
**Dr. Pangung Sutapa, M.S.**



## CONTENTS

Cover .....	i
Preface .....	ii
Content .....	iii
Keynote Speaker .....	iv
Guest Speakers .....	V
 Manipulative Motions of 2010 Academic Year PJKR Students Ability of Net Teaching Lecturing Amat Komari, Yogyakarta State University, Indonesia .....	   1
 Ability of Physical Education Teachers in Implementing Learning Outdoor Education (Studies in Outdoor Education Trainees) Aris Fajar Pambudi, Yogyakarta State University, Indonesia .....	   9
 Designing Physical Education (PE) Learning Using Scientific Approach Aris Priyanto, Sport and Youth Department Yogyakarta, Indonesia .....	   15
 A Comparative Study on Sport Education Concept and Movement Education Concept in Physical Education Teacher Education: an Over View on Existencial Phenomenology Bambang Abduldjabar, Indonesia University of Education, Indonesia .....	   22
 Playing Aids and Early Childhood Motor Skill in Kindergarten Banu Setyo Adi, Yogyakarta State University, Indonesia .....	   33
 The Effect of Traditional Games Toward Physical Fitness Elementary School Students Dewi Septaliza, Bina Darma University, Indonesia .....	   40
 The Human Resource Profile of Early Childhood Education (PAUD) Teacher for Motoric Aspect of Early Childhood Children Endang Rini Sukamti, Yogyakarta State University, Indonesia .....	   46
 Big Ball Game Modification for Learning Physical Education A Erlina Listyarini, Yogyakarta State University, Indonesia .....	   53
 School as Sport Health Promotion Place to Improve Students Health Level Erwin Setyo Kriswanto, Yogyakarta State University, Indonesia .....	   60
 The Influence of Learning Pattern and Adversity Quotient towards the Achievement of Javelin-Throw Lesson after Controlling Student Previous Knowledge Ishak Aziz, Padang State University, Indonesia .....	   68
 Knowledge Level Students PJKR C Forces 2011 about Violations and Penalties in Football Game Nurhadi Santoso, Yogyakarta State University, Indonesia .....	   76

Study of Information Systems Material Strength Training Program Fitness Activities for Elementary School Children Ranu Baskora Aji Putra, Semarang State University, Indonesia .....	84
The Theory of Achievement Motivation Elliot Model in A Physical Education Siti Hajar, Tunas Pembangunan University, Indonesia .....	91
Outcome-Based Evaluation of Kasetsart University Students Participated in Outdoor Education Camp Program Suvimol Tangsujapoj, Kasetsart University, Thailand .....	97
The Performance of Health and Physical Education Teachers in Government Elementary Schools Graduated from Opened University of Indonesia in Purworejo Triyono, Open University of Indonesia, Indonesia .....	106
Analysis Factors Related to Overweight at Student of Junior High School Wilda Welis, Padang State University, Indonesia .....	117
Designing Motor Learning in Physical Education at Schools Yudanto, Yogyakarta State University, Indonesia .....	125
Game Volleyball Preparing Attack for Sport and Health Education Learning for First Class in Junior High School Yuyun Ari Wibowo, Yogyakarta State University, Indonesia .....	133
The Understanding Level of Tactic and Strategy of Basketball Game in PJKR Students of FIK UNY Tri Ani Hastuti, Yogyakarta State University, Indonesia .....	142
The Influence of Exercise the Barrier Hops on Crossing at Students Young Indonesian Soccer Football Club in Palembang Ahmad Richard Victorian, Bina Darma University, Indonesia .....	152
Validity and Reliability of Futsal Skill Test Agus Susworo Dwi Marhaendro, Yogyakarta State University, Indonesia .....	157
Physical Exercise for Tennis Athlete with Weight Training Ahmad Nasrulloh, Yogyakarta State University, Indonesia .....	165
A Review Nutrition Intake before Competetion and Factors Influencing Women's Swimming Athletes in Swimming Club Padang Anton Komaini <sup>1</sup> and Tika Sebrina <sup>2</sup> Padang State University, Indonesia .....	172

Physical Exercise for Early Childhood Taekwondo Devi Tirtawirya, Yogyakarta State University, Indonesia .....	184
Correlation Between Protein, Fat and Carbohydrate with Arm Power and Leg Power in Pencak Silat Combative Pelatda DIY Athlete Dwi Wahyuningsih <sup>1</sup> , B.M Wara Kushartanti <sup>2</sup> , Arta Farmawati <sup>3</sup> , B.J. Istiti Kandarina <sup>4</sup> , and Mirza Hapsari Sakti Titis Penggalih <sup>5</sup> Gadjah Mada University <sup>1</sup> , Yogyakarta State University <sup>2</sup> ; GadjahMada University <sup>3,4,5</sup> , Indonesia .....	194
Comparasion of Body Composition and Somatotype Characteristics of Sprinter Athletes at AUE and YSU Eddy Purnomo <sup>1</sup> , Norikatsu Kasuga <sup>2</sup> , and Hideki Suzuki <sup>3</sup> <sup>1</sup> Yogyakarta State University, Indonesia; <sup>2,3</sup> Aichi University of Education, Japan .....	202
Identification of Management Standards Infrastructure and Facilities Management Fencing Organization in Yogyakarta Faidillah Kurniawan, Yogyakarta State University, Indonesia .....	208
ACTN3 R577X Polymorphism and Body Composition Profile of Indonesian Karate Athletes Rachmah Laksmi Ambardini, Yogyakarta State University, Indonesia .....	223
Development of Learning Media Movement Rhythmic Activity Model for Students SD Form VCD Siti Nurrochmah <sup>1</sup> , Tatok Sugianto <sup>2</sup> , and Sri Purnami <sup>3</sup> , State University of Malang, Indonesia .....	228
Revitalizing Sepaktakraw Ninja Smash Using Hanging Ball and Mattress I Ketut Semarayasa, Education University of Ganesha, Indonesia .....	239
Menstruation and Female Athlete's Performance Indah Prasetyawati Tri Purnama Sari, Yogyakarta State University, Indonesia .....	246
Identification of Hydration Status with Urine Profile Measurement and Drink Consumption in PencakSilat Athlete in Yogyakarta State University Inna Rachmawati <sup>1</sup> , Neni Trilusiana Rahmawati <sup>2</sup> , Mirza Hapsari Sakti Titis Penggalih <sup>3</sup> , and B.J. Istiti Kandarina <sup>4</sup> , GadjahMada University, Indonesia .....	254
Model of Mental Training for Swimming Athletes Juriana, Jakarta State University, Indonesia .....	266
The Implementation of Physical and Health Education in School Kamal Firdaus, State University of Padang, Indonesia .....	273

The Factor That Affects Participants of Kasetsart University's Thai-Sword Competition Kanlapruk Polsorn <sup>1</sup> and Dr. Achara Soachalerm <sup>2</sup> , Kasetsart University <sup>1,2</sup> , Thailand .....	279
Measuring Service Satisfaction in Tirta Kirana's Swimming Pool Kurnia Tahki <sup>1</sup> and Juriana <sup>2</sup> , Jakarta States University, Indonesia .....	284
The Effects of Isotonic Drink, Coconut Water, and Plain Water on Hydration Status of Football Athlete by Urine Profile Viewing Mirza Hapsari Sakti Titis Penggalih <sup>1</sup> , Arta Farmawati <sup>2</sup> , Retno Sutomo <sup>3</sup> , Muhammad Nurhadi <sup>4</sup> , Wiryatun Lestariana <sup>5</sup> , Muhammad Juffrie <sup>6</sup> , Lisandra Maria Goretti <sup>7</sup> , and Hamam Hadi <sup>8</sup> , Gadjah Mada University, Indonesia .....	291
Relationship Between Percentage of Body Fat and Somatotype Athletes of Pencak Silat Combative Class Regional Training (PELATDA) Daerah Istimewa Yogyakarta Nadia Hanun Narruti <sup>1</sup> , B.J. Istiti Kandarina <sup>2</sup> , Arta Farmawati <sup>3</sup> , and Mirza Hapsari Sakti Titis Penggalih <sup>4</sup> , Gadjahmada University, Indonesia .....	297
The Analysis of the Physical Condition, Will Pencak Silat Construction Training Center Students (PPLP) of West Sumatra Nurul Ihsan, Padang State University, Indonesia .....	307
Understanding "Sports Hernia" (Athletic Pubalgia) as A Chronic Groin Injury in Athletes Sendhi Trisanti Puspitasari State University of Malang, Indonesia .....	312
A Study on Achievement Motivation by Gymnastics Floor Athlete's in Sijunjung Regency Sri Gusti Handayani, Padang State University, Indonesia .....	323
Effect of Stress and Anxiety Swimming Performance Athletes Sungkowo, Semarang State University, Indonesia .....	334
Effect of Sensitivity Proprioceptive and Plyometric Training for Jump Serve Success on Volleyball Syarif Hidayat, Ganesha Education University, Indonesia .....	341
Analysis of the Grand Strategy of National Sport Performance Development of 2014 - 2024 Wawan S. Suherman, Yogyakarta State University, Indonesia .....	348
"No Practice, Watch Only": Sport in Consumer Society Anirotul Qoriah, Semarang State University, Indonesia .....	355
The Field of Lecturers Expertise Based on Sport Science Development Bambang Priyonoadi <sup>1</sup> , Saryono <sup>2</sup> , and Soni Nopembri <sup>3</sup> , State University Of Yogyakarta <sup>1,2,3</sup> , Indonesia .....	364

Correlation of Nutrition Status and Dysmenorrhea Painful to Female Students Sports Science Departemet Faculty of Sport Science Yogyakarta State University Cerika Rismayanthi, Yogyakarta State University, Indonesia .....	370
Warming-Up Exercises for Mini-Volleyball Danang Wicaksono, Yogyakarta State University, Indonesia .....	381
Gateball as An Alternative Sport to Maintain Physical Fitness of Elderly Fatkurahman Arjuna, Yogyakarta State University, Indonesia .....	390
Survey of the Understanding Level of Physical Education Teachers to Design Games in Elemantary Schools in Malang Febrita P. Heynoek <sup>1</sup> , Sri Purnami <sup>2</sup> , and Dona Sandy Y <sup>3</sup> , State University Of Malang, Indonesia <sup>1,2,3</sup> .....	399
Changes in Blood Lactic Acid Levels after Active, Corstability, and Passive Recovery Hajar Danardono, Tunas Pembangunan University Surakarta, Indonesia .....	405
The Role of Branched Chain Amino Acids as Dietary Sports Supplements I Made Satyawani <sup>1</sup> and I Wayan Artanayasa <sup>2</sup> , Ganesha Education University, Indonesia <sup>1,2</sup> .....	415
The Effect of Side Jump Sprint Training with 1:3 and 1:5 Work: Rest Relief Ratio on Leg Muscle Power I Nyoman Sudarmada, Ganesha Education University, Indonesia .....	422
Marketing Strategies of Tubing Sports to Increased Tourist to Visit Bali I Wayan Muliarta <sup>1</sup> and Kadek Yogi Parta Lesmana <sup>2</sup> , Ganesha Education University, Indonesia .....	429
The Importance of Emotional Maturity and the Ability on Think Positive for Athletes Komarudin, Yogyakarta State University, Indonesia .....	437
The Effects of Training and Achivement Motivation on Vertical Jumping Ability Muslimin, Bina Darma University Palembang, Indonesia .....	443
Integrated Physical Education in The Context of 2013 Indonesian Primary School Curriculum Soni Nopembri <sup>1</sup> , Saryono <sup>2</sup> , and Ahmad Rithaudin <sup>3</sup> , Yogyakarta State University, Indonesia <sup>1,2,3</sup> .....	451
The Effect of Aerobic and Anaerobic Exercises on Premenstrual Syndrome (PMS) (Experimental Study On Students FikUnp) Umar Padang State University, Indonesia .....	460

Learning Model of Physical Education Using Multiple Intelegenscies Approaches and Influence on Creativity Development Roesdiyanto, State University of Malang, Indonesia .....	466
Neutrophils Percentage after Consuming Red Guava Juice (PsidiumGuajava L. Red Cultivar) During Aerobic Exercise Yuliana Noor Setiawati Ulvie <sup>1</sup> and Sugiarto <sup>2</sup> , <sup>1</sup> Nutrition Study Program, University of Muhammadiyah Semarang <sup>2</sup> Faculty Of Sport Science, Semarang State University .....	473

International Seminar  
FIK UNY  
23 April 2014



# INDONESIAN ELITE SPORTS DEVELOPMENT

( Analyzed of the Missing Link)

Oleh :

**Prof. Dr. Djoko Pekik Irianto, M.Kes., AIFO**

**DEPUTI BIDANG PENINGKATAN PRESTASI OLAHRAGA KEMENPORA RI**

Wibesite Kemenpora: <http://www.kemenpora.go.id>



# THE 2005 LAW NO.3 ON NATIONAL SPORTS SYSTEM – Chapter II



## Article 4

- National sports aim to keep and improve health and fitness, achievement, human quality, to instill moral value and good character, sportsmanship, discipline, to build and maintain unity and cohesion of a nation, to strengthen national resilience, as well as raising the status, dignity and pride of a nation.

# ROADMAP OF SPORT ACHIEVEMENT



## Olympic Games

TH	2008	2012	2016	2020	2024
RANK	42	35	30	25	20



## Asian Games

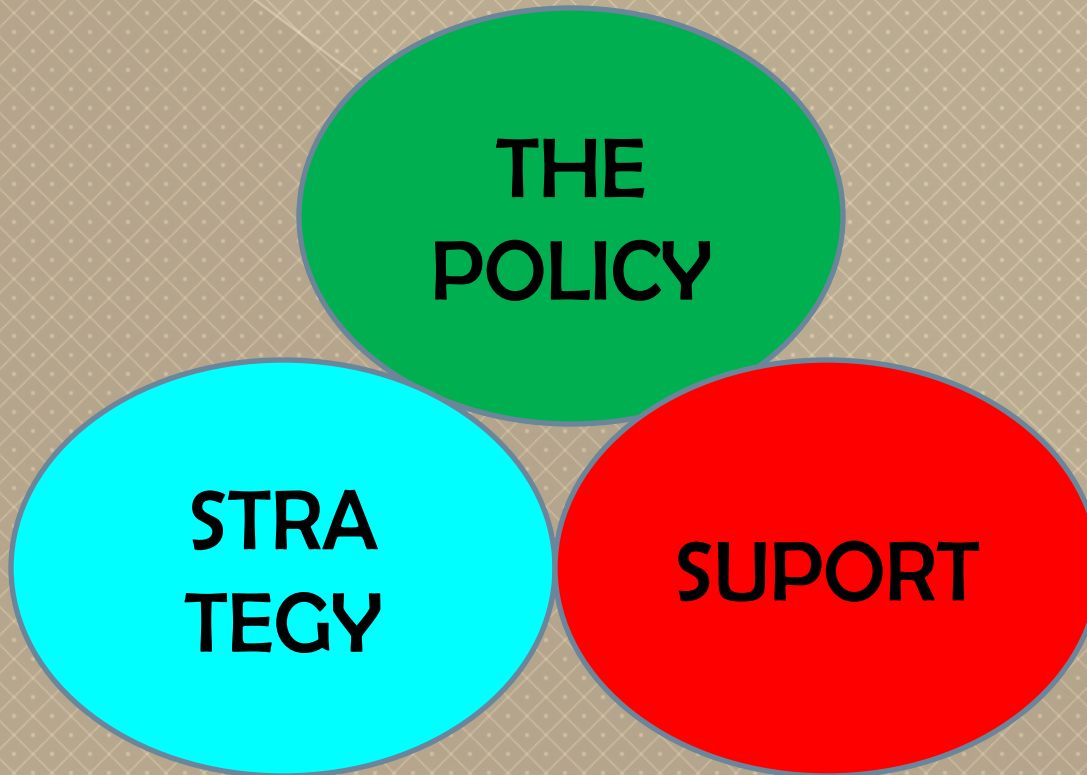
TH	2006	2010	2014	2019	2023
RANK	22	15	10	08	05



## Sea Games

TH	2005	2007	2009	2011	2013
RANK	05	04	03	01	01

# **DIMENTION OF SPORT DEVELOPMENT**



**THE  
POLICY**



**SPORTS IS PLACED  
AS A MAIN PILLAR  
OF DEVELOPMENT**

**SUPPORT**



**THE PYRAMID SYSTEM  
OF SPORTS  
ACHIEVEMENT**

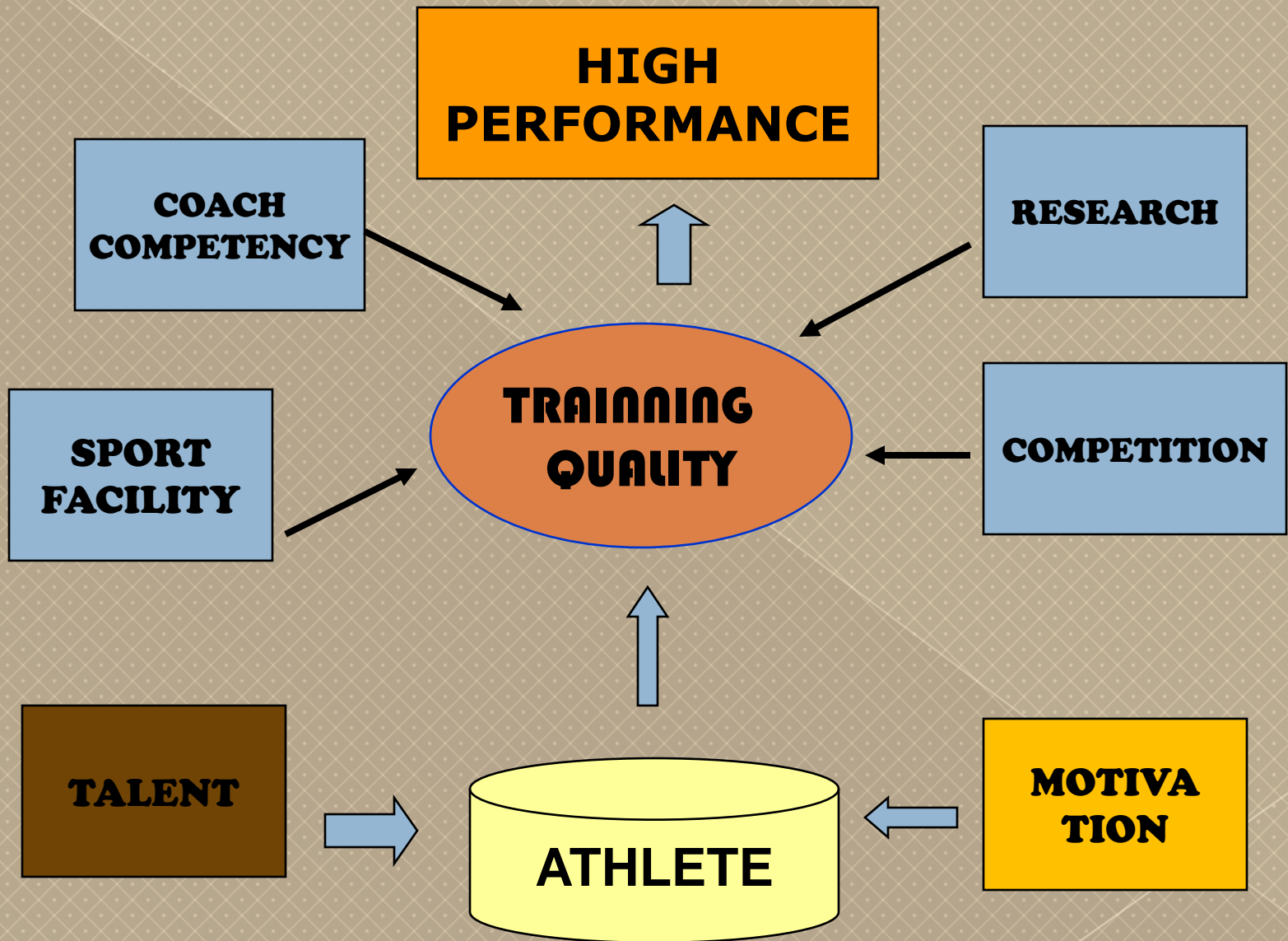
**STRATEGY**



**PRIORITY PROGRAM  
BASED ON SPORT  
POTENTIAL REGIONAL**

# NORM Vs FACT

NORM	FACT
<b>THE POLICY :</b> SPORTS is placed as a main pillar of development	It is currently in the 14 <sup>th</sup> pillar, alongside the pillar of the people's prosperity.
<b>SUPPORT:</b> <ul style="list-style-type: none"><li>• The pyramid of the achievement development system</li><li>• Domain of Sports as a unity (Sports Education, Recreation and Achievement)</li></ul>	<ul style="list-style-type: none"><li>• Incomplete pyramid, the basic step are not yet managed properly</li><li>• The domain of sport is meant only partially</li></ul>
<b>STRATEGY:</b> development of sport from sport Priority( numer / class) based on regional potential	Sport achievement of popular sports



# NORM Vs FACT

NORMA	FAKTA
Competence of Coach / Trainers	<ul style="list-style-type: none"><li>• The Lacking of coach in quantity &amp; quality</li><li>• Coach for Asian games 2014, Seagams 2015→ Graduated from FIK only 11 % (Faculty of Sports)</li></ul>
Research In Sports	<ul style="list-style-type: none"><li>• Minimum research quantity</li><li>• Research are not yet “need and problem “ based</li><li>• Research are not applicable</li><li>• Most of coach are reluctant to : to learn the science of coaching, application of Sports Science</li><li>• There are still many distance between scientist (campus) with Sports Practitioners (field)</li></ul>



NORM	FACT
Competition	<ul style="list-style-type: none"> <li>• Step ladder, regularity, integration of competition are not yet maximum.</li> <li>• Should have increase the quality</li> </ul>
Sports Facilities	<ul style="list-style-type: none"> <li>• Infrastructure standard are not yet prevalent</li> <li>• Financial : <ul style="list-style-type: none"> <li>- Support from the Government are not yet optimal 0.335 % APBN)</li> <li>- support from private office are not yet maximum ( CSR can not be use in sports)</li> </ul> </li> <li>• Institutional : Sports Stakeholder tendency have no unity between another Vision ( KOI-KONI, PB)</li> </ul>



NORMA	FAKTA
Athletes Motivation	<ul style="list-style-type: none"> <li>• Dominant tendency of external motivation</li> </ul>
Talent	<ul style="list-style-type: none"> <li>• Talent is to be found but not scouted</li> <li>• The basic of sports Talent Scouting are not use yet</li> </ul>

# ELIT SPORT DEVELOPMENT PYRAMID



- OLYMPIC G.
- ASIAN G
- ASIAN INDOOR G.
- SEA G.
- BEACH G
- POM ASEAN
- POM ASIA
- POMNAS
- Universiade

- YOUTH GAME
- SCHOOL G.
- POPNAS,
- POPWIL
- O2 SN

**ACTION**

**ATLET ELIT**  
High Performance,  
Prima Utama, PPLM,  
Kompetisi Multi Event

**ATLET MUDA:**  
Klub Remaja, junior, PPLP, SKO, Prima Pratama,  
Kompetisi: POPNAS- antar PPLP dll

**PEMBIBITAN:**  
Mencari/bukan menemukan bibit, parameter, di sekolah-  
klub-masyarakat, gunakan ipteks, guru penjas perlu skill  
pembibitan

**PERLUASAN BASE:**  
Gaya Hidup Or, partisipan Or usia dini, kebugaran, Penjas,  
Multilateral, sarana or di mana-mana, festival, class meeting or,  
( Keluarga- Sekolah-masyarakat)

# STRATEGY (2015–2019)

1. Quality of Sports of Sport Trainers
2. Talent Scouting → Based on strong of sports development ( Sports Junior Club, Schools of Sports – SKO)
3. Health of Sports Organization
4. Development of Priority Sports
5. Hierarchical and integrated competitions
6. Application of Sports Science in all achievement development stages
7. Sufficient of facilities and infrastructure
8. Reward : Guarantee of sufficient livelihood and appreciation for Sports Workers

## SPORT DISCIPLINE PRIORITY

PRIORITAS	OLYMPIC	ASIAN GAMES
1.	Badminton	Badminton
2.	Weight Lifting	Weight Lifting
3.	Archery	Archery
4.	Boxing	Boxing
5.	Taekwondo	Taekwondo
		6. Rowing
		7. Cycling
		8. Sailing
		9. Karate
		10. Wushu

# **INDONESIAN ELITE SPORTS DEVELOPMENT ACCELERATION**



# INSTRUMENT ACCELERATION

APPRECIATION	<input type="checkbox"/> Appreciation, future and old-age assurance for athletes and coach
PARAMETERS	<input type="checkbox"/> Implementing standard in all segments to effort to obtain the Sports achievement
SPORTS SCIENCE	<input type="checkbox"/> Implementing of Sports science in all process : massing – <input type="checkbox"/> talent scouting – training – competition – recovery – injury treatment
CENTRAL	<input type="checkbox"/> Sports Schools for the athletes with professional management
KOMPETITION	<input type="checkbox"/> Quality of Competition in systematic framework
BASIS	<input type="checkbox"/> Enlarge of base for strong candidates of athletes
ORGANIZATION	<input type="checkbox"/> Synergizing and empowerment of institutions

**CAPITAL:**  
**FUND – SERIOUSNESS – TOGETHERNESS**

# Minimum Standard of Sports

**Achievement** UU No 3/ 2005 SKN, chapter 93

- ▶ Coach / Trainers
- ▶ Association
- ▶ Training / Course
- ▶ Facilities and infrastructure
- ▶ Competition, championship/ Sports Weeks
- ▶ Training Centers
- ▶ Sports Science
- ▶ Information systems
- ▶ Financial and appreciation





## **CURICULUM VITAE**

**Prof. Dr. Djoko Pekik Irianto, M.Kes..AIFO**

### **Pendidikan :**

- S1: Pendidikan Olahraga dan Kesehatan, Fakultas Keguruan Ilmu Keolahragaan ( FKIK ) IKIP Yogyakarta
- S2: Program studi Ilmu Kesehatan Olahraga Universitas Airlangga Surabaya
- S3: Program Studi Ilmu Keolahragaan Universitas Negeri Surabaya.

**Course** :Level I Strength & Conditioning ( Pelatih Fisik) ASCA ( Australia ), Sport Nutrition ( UGM-Jogyakarta)

**Pekerjaan** : Dosen Pada Jurusan Pendidikan Kepelatihan Olahraga , FIK Universitas Negeri Yogyakarta.

**Jabatan** : **DEPUTI BIDANG PENINGKATAN PRESTASI OLAHRAGA KEMENPORA RI**

**Bidang Keahlian** : Sport Coaching , Sport Nutrition, and Fitness.

**Tugas Yang pernah diemban AI:** Instruktur (1) Strength and Conditioning (2) Pelatihan Gizi Atlet untuk pelatih, Penyedia jasa boga bagi atlet. Pernah menjadi Pelatih Fisik Sepakbola Kompetisi Liga Indonesia 2009, Konsultan Gizi klub Sepakbola pada kompetisi liga Indonesia 2010.

**Tugas tambahan** : Sekretaris Dewan Pelaksana PRIMA ( Program Indonesia Emas) KEMENPORA.

**Organisasi** : Bidang Penelitian dan Pengabdian pada Masyarakat ISORI ( Ikatan Sarjana Olahraga Republik Indonesia) DIY. Di bidang Olahraga Prestasi : Bidang pembinaan Prestasi KONI DIY, Bidang Litbang KONI DIY Bidang Litbang PERSANI (Persatuan Senam Indonesia) DIY , Sekretaris Umum PBVSI (Persatuan Bolavoli Seluruh Indonesia) DIY, Ketua Umum PP BAPOPSI

## **Sports Culture One Student One Sport Policy in Malaysia**

### **Abstract**

Gunathevan Elumalai (PhD)  
Sultan Idris Education University

Sport and fitness is becoming more and more important in the lives of every human on the earth. Sports should be integral in a person's life. This is due to the benefits derived in terms of health and to increase their mastery of nature and the environment (WHO 2010). Sport involves basic human skills which are developed and exercised for their own sake, in parallel with several advantages and benefits. Centers for Disease Control and Prevention, (2010), emphasised the risk of insufficient sport and physical activities in adolescents which lead to negative effect on health and fitness. Malaysia has a long history in sports, unfortunately in recent years; the glory dwindled due to the society's changing lifestyle. This phenomenon has prompted the government to form a new policy promoting the school Physical Education and sporting activities. Malaysian Education Ministry has launched "One Student One Sport" policy on 9th of June 2011, which focused on producing and developing a well balanced student in terms of physical, emotion, spiritual and intellect. The policy is in line with the National Sports Policy to cultivate sports in the community, and was started in schools through two strategies, that is "Sports For All and Sports For Excellence." One of the aims include nurturing human capital through wholesome participation amongst students in sports throughout the year, cultivating a sporting culture so that they become a member of the society with an active, balanced and healthy lifestyle, forming good values and self-discipline and creating a track record towards sporting excellence. The purpose of the policy is to move towards a balanced development of body and mind of our young ones. At the same time, it hopes to instill health and vitality into the sports culture in schools. But, the success of "one student, one sport" policy depends on three factors. First, the Education Ministry must try to meet the needs of sports facilities and equipments. The second factor is that the number of sports periods must be increased. Third, the Physical Education curriculum design also requires some changes in order to attract the interest of students and make it as a culture in their life.

### **1.0 Introduction**

Sport and fitness is becoming more and more important in life of every people all over the world. It is because people are being aware of the vital of doing sport and physical activity to improving physical and mental health (WHO 2010 ; Baumgartner, Jackson, Mahar, & Rowe, 2003). Sports should be integral to a person's life. This is due to the benefits in health that can be derived from it to increase their mastery of nature and the environment (WHO 2010). Sport involves basic human skills which developed and exercised for their own sake, in parallel with several advantages and benefits. First, sports are required by people to be healthy, fit, smart, and good looking. Second, sports are entertaining due to many facts. Third, sports are the huge market for countries' (Azhari Rosman, 2009).

There are numerous studies of sport and fitness which illustrate vast benefits of sport participant. Sport and physical activities (PA) are constituents of enhancing health and enriching the social interconnection to support a meaningful life to people all over the world (Grant, 2001 & Collins 2003). Nevertheless, Centers for Disease Control and Prevention, (2010), emphasised the risk of insufficient sport and PA in adolescents which lead negative affect to health and fitness.

Malaysia has a long history in sports, beginning from the colonial era when the British introduced it in the 19<sup>th</sup> century. This uniting legacy they left behind has grown in importance over the years, and is now regarded as one of the key elements in nation building. Sports in Malaysia has shown that despite having distinct ethnic and cultural diversity, it is indeed possible to create rapport through shared mutual passion and even opposing rivalry, as it hones character development and teambuilding. Sports have shaped Malaysian society even before independence. Unfortunately in recent years, the glory once associated closely to sports has since dwindled as the result of society's changing lifestyle (Sheikh Kamaruddin, 2012). Having realized the situation and setbacks in sports, the government has taken approaches to ensure that sports continues to play an important role not only to regain the nation's past glory but also to instil passion in sports among all Malaysians.

Malaysian sports cut off from the glory of the past are going through a turmoil and deep crisis because many of our schools, colleges, universities, the state and national sporting bodies are not doing enough to produce and develop new talents and champions (Sheikh Kamaruddin, 2012). The situation regarding sports in the country is being criticized by many sports loving people and this phenomenon has prompted the government to form a new policy promoting the school Physical Education and sporting activities.

## **2.0 One Student One Sport Policy**

Malaysian Education Ministry has launched "One Student One Sport" policy on 9th of June 2011, which became spear of two heads to complement school sport development scope in producing and developing well balanced students in terms of physical, emotional, spiritual and intellectual. The policy is in line with the National Sports Policy to cultivate sports in the community, and must be started in schools through two strategies, that is "Sports For All and Sports For Excellence." One of the aims include nurturing human capital through wholesome participation amongst students in sports throughout the year, cultivating a sporting culture so

that they become a member of the society with an active, balanced and healthy lifestyle, forming good values and self-discipline and creating a track record towards sporting excellence.

The “One Student One Sport” policy is also conceptualised to provide access to all students in obtaining benefits from involvement in sports, especially to the less privileged, different health backgrounds or disabilities, less active students and provide opportunity to all students with talents and potentials to be polished to a higher level. The policy compel all pupils that did not experience health problem choose one sport of game offered in the school workable with school agreement. The ministry has outlined several ways in order to strengthen the implementation of this policy and those are that, the school should plan how to maximize the use of facilities, equipment and expertise, to collaborate with relevant agencies and ensure sports throughout the year.

According to the Malaysian Education Ministry, the main aim of this policy is to have a Healthy Social School Environment and also to help fulfil the joint working objectives between Ministry of Education and other key government agencies like Ministry of Health which involve in health issues and the Ministry of Youth and Sport which is involved in the development for sports for all and sports for high performance. As written in our National Sports Policy, the Ministry of Education will provide time for physical education for all pupils as well as develop and coordinate sports activities in schools including the development of leadership qualities in sport and physical education. In line with this aim the “One Student One Sport” policy has a few objectives as below:-

- i. Increase physical fitness
- ii. Develop character, self-esteem discipline and moral values
- iii. Foster racial unity
- iv. Develop a sports culture amongst students
- v. To full fill school children’s natural affinity for physical activities
- vi. To provide balance between academic and physical needs
- vii. To provide a platform towards sports excellence

The “One Student One Sport” policy is made compulsory for Standard 4 to Standard 6 children in Primary Schools and Remove class, Form 1 to Form 6 in Secondary schools. For preschool children up to Standard 3, they are encouraged to participate in this programme according to the school’s capacity. There are few factors to be considered while implementing this policy. Before the “One Student One Sport” policy is carried out, it has to take into account these principles:

- i. Every student including special needs students without any health problems, will be required to take part in at least one type of sports
- ii. A student can take part in more than one sport according to his ability and the type of sports offered by the school, or that is carried out with the agreement of the school
- iii. The type of sports offered under the “One Student One Sport” policy must have elements of physical movements
- iv. Sports activities are held in school throughout the year in accordance with sports house or sports club activities. School athletic tournaments with cross country runs and pre-standard sports as leading events are core sports activities in school
- v. This “One Student One Sport” policy is based on the implementation of a high quality physical education as a subject
- vi. The most important aspect is active participation by all students in sports activities
- vii. Parents and external agencies/sports allies are encouraged to contribute towards the growth of school sports
- viii. Each school with existing infrastructure, facilities and equipment for sports must optimize its use to increase active participation of its students

### **3.0 Theoretical Background**

There are few theories and models related to this “One Student One Sport” policy. Among these, Cloninger’s Temperament and Character Model (1993) and Multilateral Training Theory by Bompa (2005), are giving some basic guidelines to the authorities who involve directly or indirectly in the implementation process.

### 3.1. Cloninger's Temperament and Character Model (1993).

According to Buss and Plomin (1975&1984), Cloninger's Model of personality, including 4 temperament dimensions and 3 character dimensions, is one of the most well-known theories in recent years. Cloninger's definition on temperament and character is the following:

*"Temperament represents automatic responses in information processing and learning, presumed to be heritable, whereas character reflects personality development in the context of insight learning and environmental experiences."*

Cloninger hypothesized four temperament dimensions of personality which are assumed to be genetically independent and have predictive validity for patterns of response to specific environmental stimuli. These temperament dimensions are: Novelty Seeking, Harm Avoidance, Reward Dependence and Persistence. ( Figure 1).

- i. **Novelty Seeking** is characterized by behavioural activation in response to new stimuli or cues for potential reward or potential relief of punishment.
- ii. **Harm Avoidance** is defined as a heritable tendency to respond intensively to signals of aversive stimuli, and responsible for learning to inhibit behaviour to avoid punishment.
- iii. **Reward Dependence** is also a heritable tendency to respond intensively to signals of reward, and to maintain or resist the behaviour that was previously been associated with rewards or relief from punishment.
- iv. **Persistence dimension** means the maintenance of behaviour. Individuals high in Persistence are hard-working, persistent, and stable despite frustration and fatigue. They perceive frustration as a personal challenge, and do not give up easily. They tend to be a perfectionist, who wants to get more than what is necessary.

Cloninger also describes three character dimensions which are: Self-directedness, Cooperativeness and Self-transcendence.

- i. **Self-directedness** means an individual control, to regulate and adapt one's behaviour to fit the situation in accord with individually chosen goals and values.
- ii. **Cooperativeness** - Cooperativeness dimension shows the individual differences in identification with and acceptance of other people. Cooperative individuals are described as socially tolerant, empathic and helpful.

- iii. **Self-transcendence** is the third character dimension which associated with spirituality, and refers generally to identification with everything which part of a unified whole.

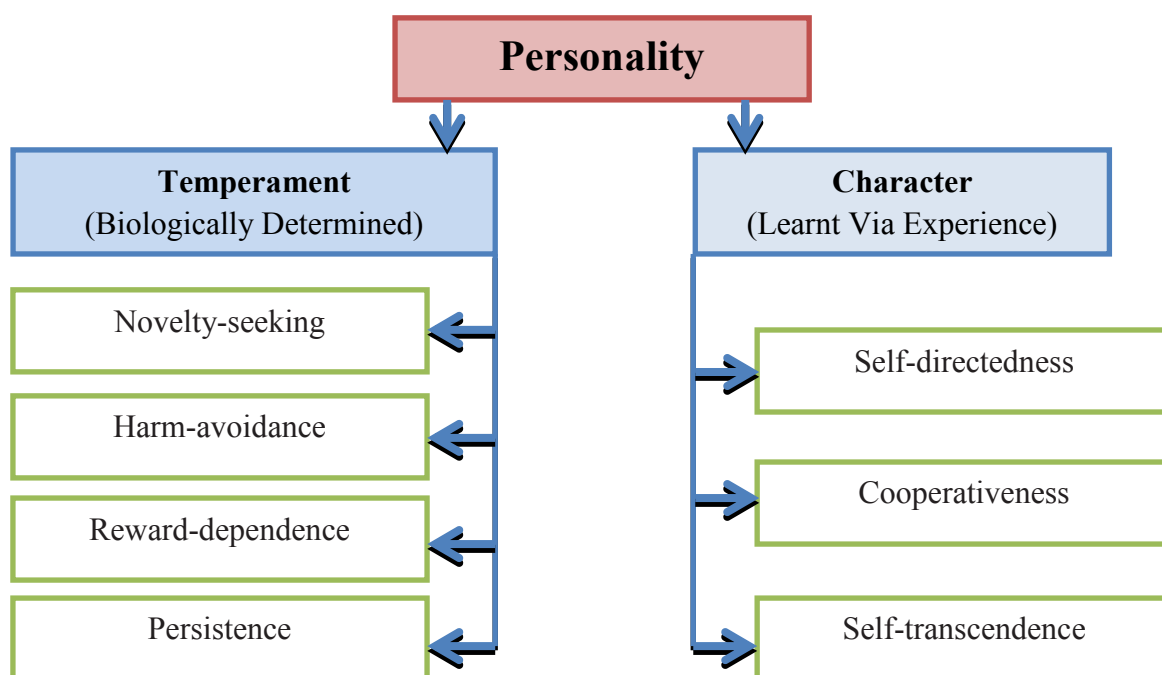


Figure 1: Cloninger's Temperament and Character Model (1993)

### 3.2. Multilateral Training Theory by Bompa (2005)

According to Bompa (2005), a policy or system should not be imported, although it may be beneficial to first study. Furthermore, in creating or developing a better policy, we must consider a country's social and cultural background. A sport system should include the physical education and sport organization of a nation, considering school programs, recreation and sport clubs, the organizational structure of sport governing bodies, and the systems of athletic training. A national sport system should consider the nation's values, traditions, climate, and sports emphasis, especially for young participants. Young people must develop the basic skills and abilities to benefit from physical instruction, as well as to perform appropriately in most sports. Base on this quotation, the “One Student One Sport” policy is having a fundamental idea to develop the Malaysians sports culture from childhood. ( Figure 2).

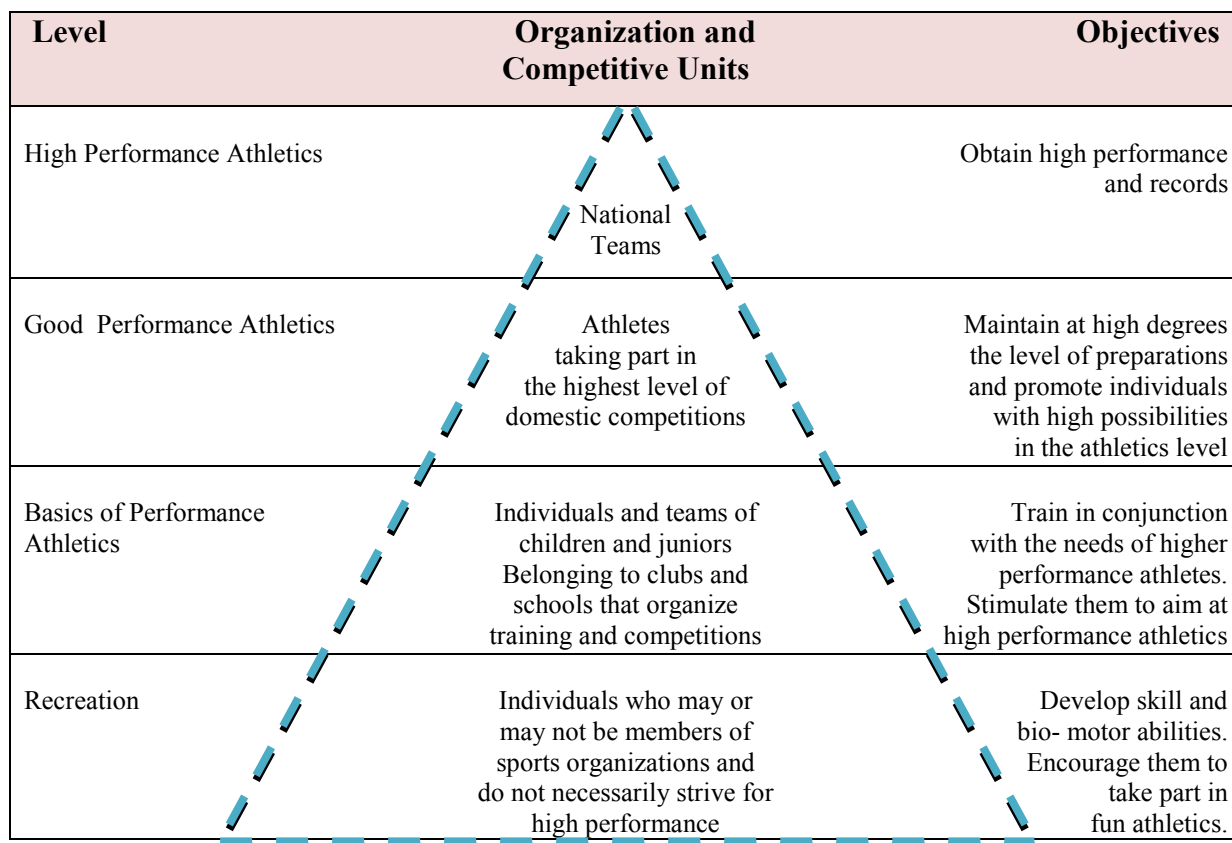


Figure 2 : A potential National Sport System

#### 4.0 Conclusion

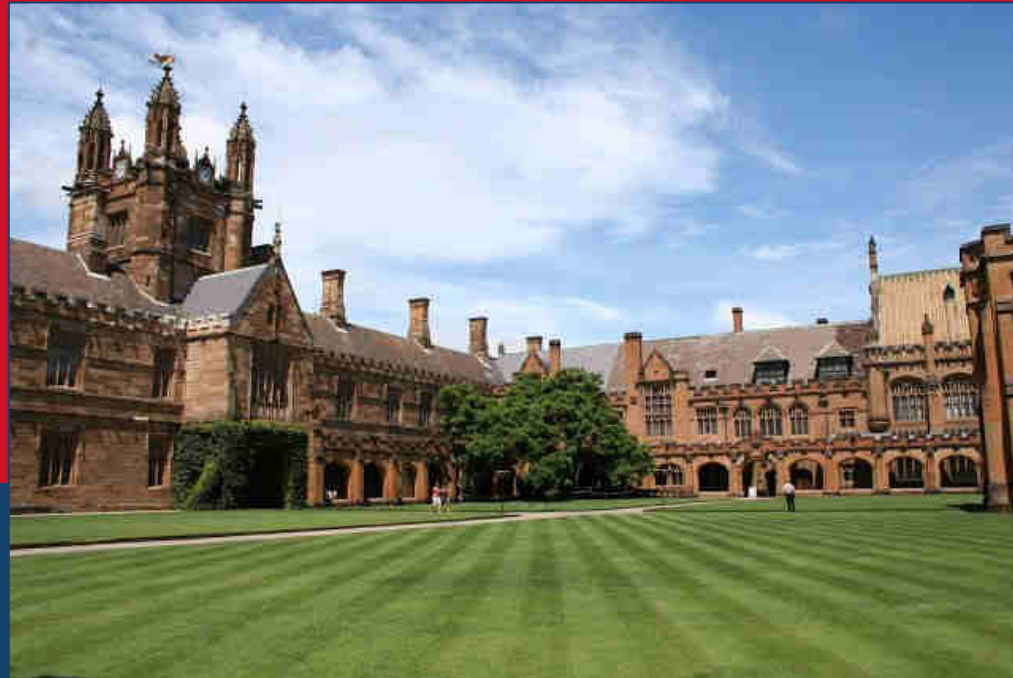
One of the objectives of this policy is to get students involved with a least one sports throughout the year with the hope that all students, including book worms, computer gamers and couch potatoes will get out of their comfort zone to be active physically. In addition, with this involvement, new talents will be discovered, groomed and trained to compete at the higher level. The purpose of the policy is to move towards a balanced development of body and mind of our young ones. At the same time, it hopes to in-still health and vitality into the sports culture in schools. But, the success of "one student, one sport" policy depends on three factors. First, the Education Ministry must try to meet the needs of sports facilities and equipment for schools. The second factor is that the number of sports periods must be increased. In countries such as Finland and Denmark where education is progressive and creative, they attach great importance to physical education. The concept of sports training and the promotion of physical development are well endorsed. Third, the Physical Education curriculum design also requires some changes in order to attract the interest of students and make it as a culture in their life.



## 5.0. References

- Azhari Rosman. (2009). Cardiovascular risk and adult morbidities. *Medical Journal Of Malaysia* 56 (2) : 13-19
- Baumgartner, T.A, Jackson, A.S., Mahar, M.T. & Rowe, A.D.(2003). *Measurement for Evaluation. In Physical Education and Exercise Science*. Edisi ke-7. USA: McGraw-Hill
- Buss, A. H. - Plomin, R. (1975). *A temperament theory of personality development*. New York, Wiley-Interscience.
- Buss, A. H. - Plomin, R. (1984). *Temperament early developing personality traits*. Hillsdale, Nj, Erlbaum.
- Centers for Disease Control and Prevention. (2010). *The association between school-based physical activity, including physical education, and academic performance*. Atlanta, CA: U.S. Department of Health and Human Services.
- Collins, M. F. (2003). *Sport and social exclusion*, London: Routledge.
- Cloninger, C. R. - Svrakic, D. M. - Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry*, 50, 975–990.
- David, L. K. (2011). Healthy people 2020. *US News & World Report*, Washington.
- Editorial Board, (2011). *IMIS guidebook*, Kuala Lumpur, Ministry of Education.
- Grant, A.M., & Greene, J. (2001). *Coach yourself: Make real change in your life*. London: Momentum Press.
- Sheikh kamaruddin (2012). *One-student-one sport: between hope and reality*. Docshut.com.
- Tudor O. Bompa & G. Gregory Haff (2005). *Periodization- theory and methodology of training* (5<sup>th</sup> ed.) Amazon. Ca.
- WHO, (2010). *Global status report on non communicable diseases 2010*. Geneva : World Health Organization.

# Human Movement and Health Education Strategies for Achieving Healthy Lifestyles in Australia



Dr Wayne Cotton





## About me

Well let me tell you a story....

› It's a story about...

...I was born in NZ and  
moved to Australia  
playing Rugby

... I studied and worked  
as a PE teacher

... I was the Director of  
Human Movement &  
Health Education  
program at Sydney  
University for the last  
3 yrs





# About Sydney University...

## Sydney University...

- › Has over 3,300 staff and over 50,000 students representing 134 countries.
- › Has 43 sporting clubs
- › Offers
  - a Bachelor of Education degree (Human Movement and Health Education)
  - a Masters of Sports Coaching and'
  - a wide range of PhD students studying PE and Sport
- › Is Australia's oldest university





## About Australia...

### Australian has 9 National Health Priority Areas...

- › Cancer Control
- › Cardiovascular Health
- › Injury Prevention and Control
- › Mental Health
- › Diabetes Mellitus
- › Asthma
- › Arthritis and Musculoskeletal Conditions
- › Obesity
- › Dementia

<http://www.aihw.gov.au/national-health-priority-areas/>





# About Physical Education in Australian

## The *NEW* draft Health and Physical Education (HPE) Australian Curriculum

- › Is... *“relevant, engaging, contemporary, physically active, enjoyable and developmentally appropriate. Integral to Health and Physical Education is the acquisition of movement skills, concepts and strategies that enable students to confidently and competently participate in a range of physical activities”*
- › Is still a draft and awaiting final endorsement.

<http://www.acara.edu.au/hpe.html>





# About our Research at the University of Sydney

## Several studies that we have recently undertaken...

- › A Systematic Review
  - ... of PE and Sport interventions
- › An small Observation Study
  - ...looking at PA and Instruction in PE
- › An Intervention Study
  - ... aimed at increasing PA in schools
- › Then we replicated this formula in other related areas

We just wanted to know more about Health, PE & sport.





# Studies at the University of Sydney

## A Systematic Review

- › Followed the 2010 CONSORT statement
- › A systematic review of the effectiveness of physical education and school sport interventions targeting physical activity, movement skills and enjoyment of physical activity.
- › *European Physical Education Review*, 17.







# Studies at the University of Sydney

## A Systematic Review – the findings

- › The results of the review detail the nature, scope and focus of intervention strategies.
- › The most effective strategies to increase PA and improve movement skills were:
  - direct instruction teaching methods
  - professional development for teachers
- › There was a lack of high quality evaluations and statistical power to draw conclusions





# Studies at the University of Sydney

## A small Observation Study

- › Systematically observed and analyzed over 80 PE classes
- › Looking at Physical Activity (PA) levels and movement skill instruction in secondary school Physical Education (PE)
- › *The Journal of Science and Medicine in Sport*





# Studies at the University of Sydney

## A small Observation Study – the findings

- › Used the System for Observing Fitness Instruction Time (SOFIT)
- › Percentage of PE class time in:
  - Moderate to vigorous physical activity (MVPA) was 56.9%
  - Skill instruction was 6%
  - Game play was 44%





# Studies at the University of Sydney in partnership with others

## An Intervention Study – the Girls in Sport Project

› The aim of the project was to:

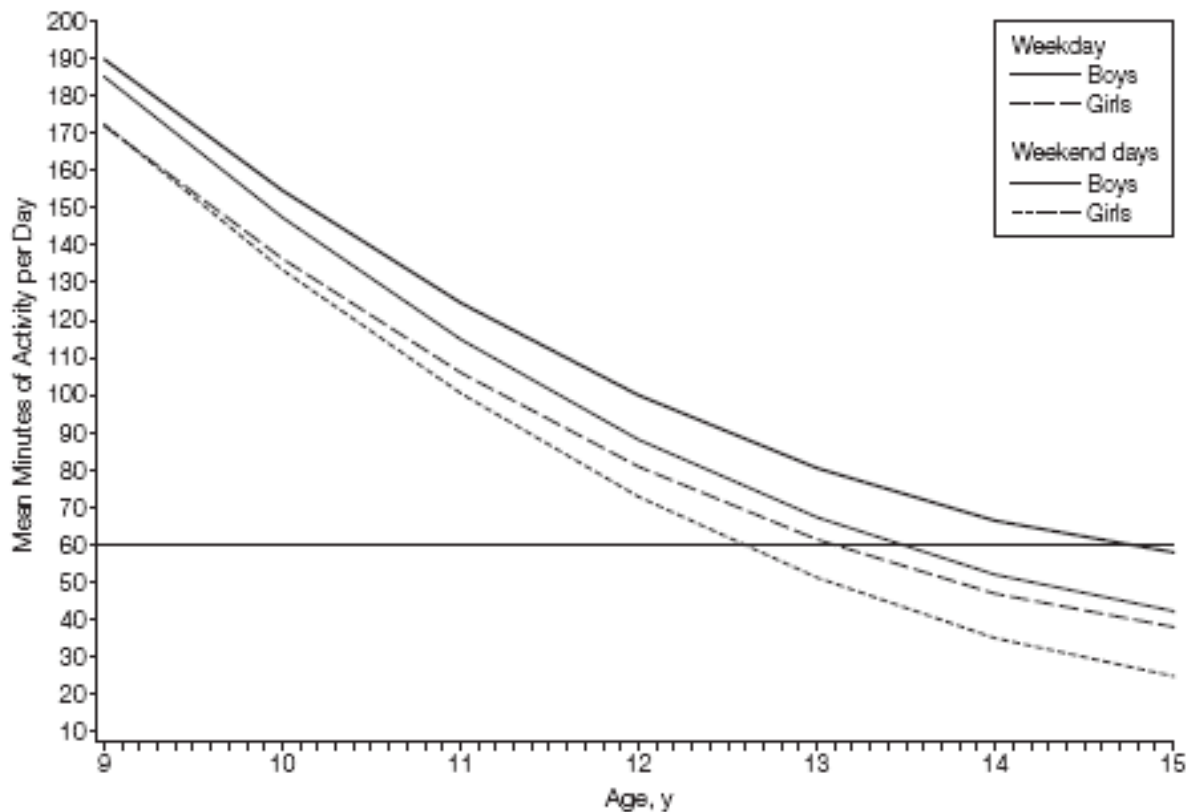
- Increase MVPA levels of girls, Years 8-10, in selected NSW secondary schools (14-16 year age range)
- Increase participation rates, attendance & engagement, enjoyment & self efficacy in school sporting activities
- Increase awareness of needs & interests of girls, links to community sport, program sustainability





# Studies at the University of Sydney in partnership with others

## The Girls in Sport Project - why



The high 'drop out' rate from organised sport is commonly reported by teachers, coaches, parents and sports administrators.

Source: Nader, et al. (2008). Moderate-to-vigorous physical activity from ages 9 to 15 years. JAMA, 300, 295-305.



# Studies at the University of Sydney in partnership with others

## The Girls in Sport Project - why

- › Results from Schools Physical Activity & Nutrition Survey (SPANS) 2010

Prevalence of mastery of the over-arm throw	Year 8 Girls (%)
In SPANS - 1997	13.5
In SPANS - 2004	13.4
In SPANS - 2010	12.2

[More information can be found here](#)



# Studies at the University of Sydney in partnership with others

## The Girls in Sport Project - why

- › Results from Schools Physical Activity & Nutrition Survey (SPANS) 2010

Prevalence of mastery of the kick	Year 8 Girls (%)
In SPANS - 1997	6.9
In SPANS - 2004	5.3
In SPANS - 2010	12.4

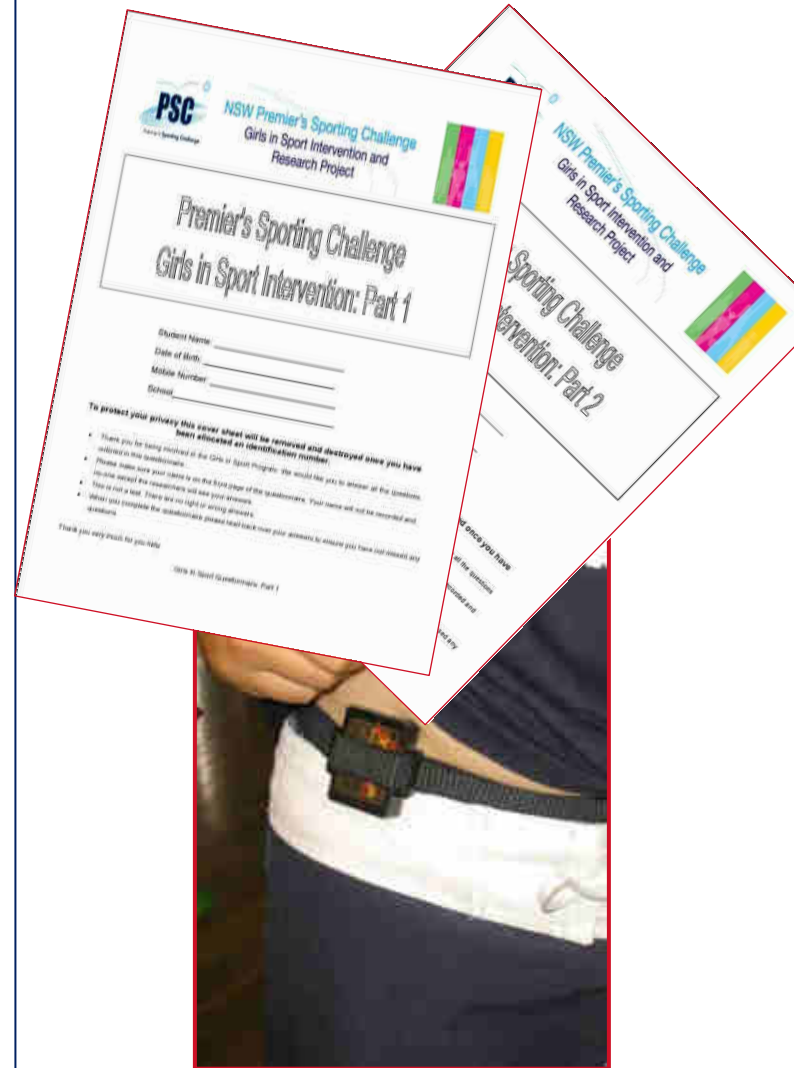
[More information can be found here](#)



# Studies at the University of Sydney in partnership with others

## The Girls in Sport - Baseline Data Collection

- › Data to be collected:
  - Quantitative Data
  - Questionnaires collected at 2 points in time
  - Participants were asked to wear accelerometers for 7 consecutive days
- › Across 24 sites, involving:
  - 1769 students
  - 30 Research Assistants







# Studies at the University of Sydney in partnership with others

## Girls in Sport – What one schools did

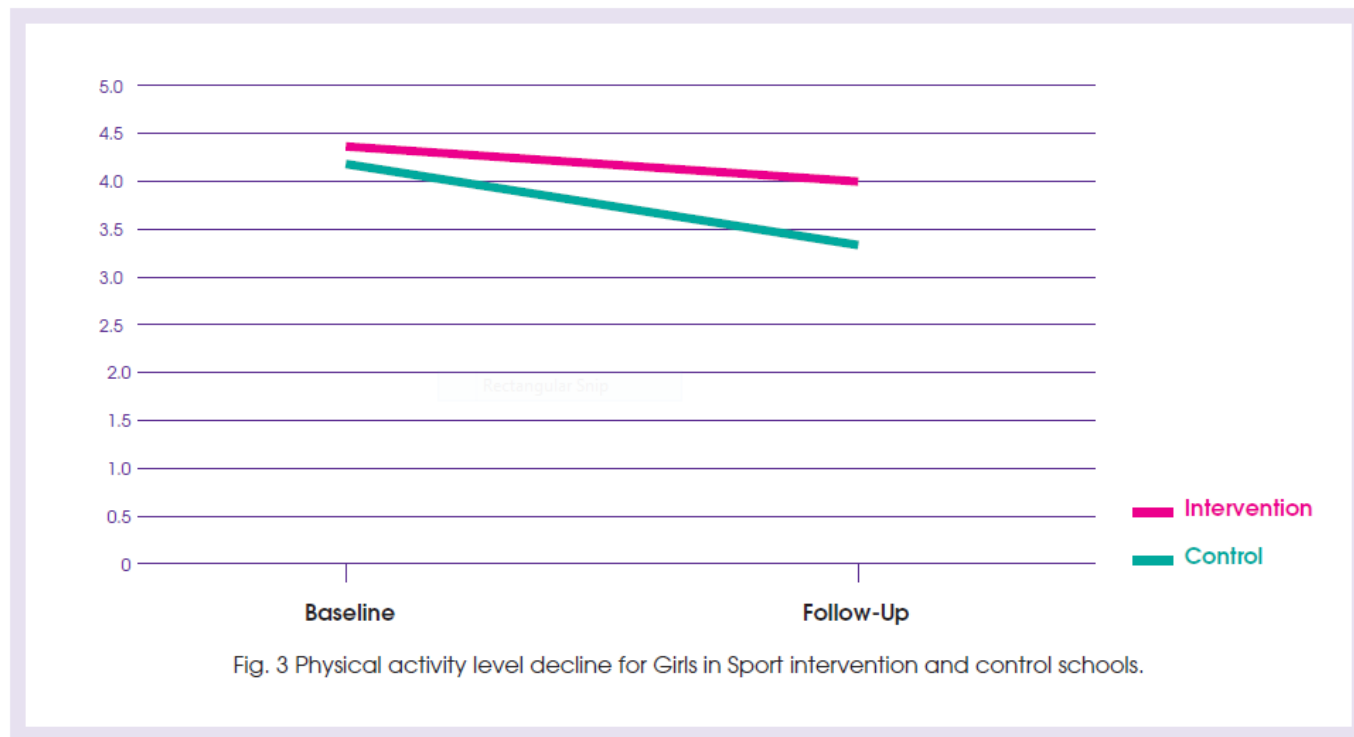




# Studies at the University of Sydney in partnership with others

## The Girls in Sport Project – Results

Have we been successful – we sort of... we slowed the decline in PA

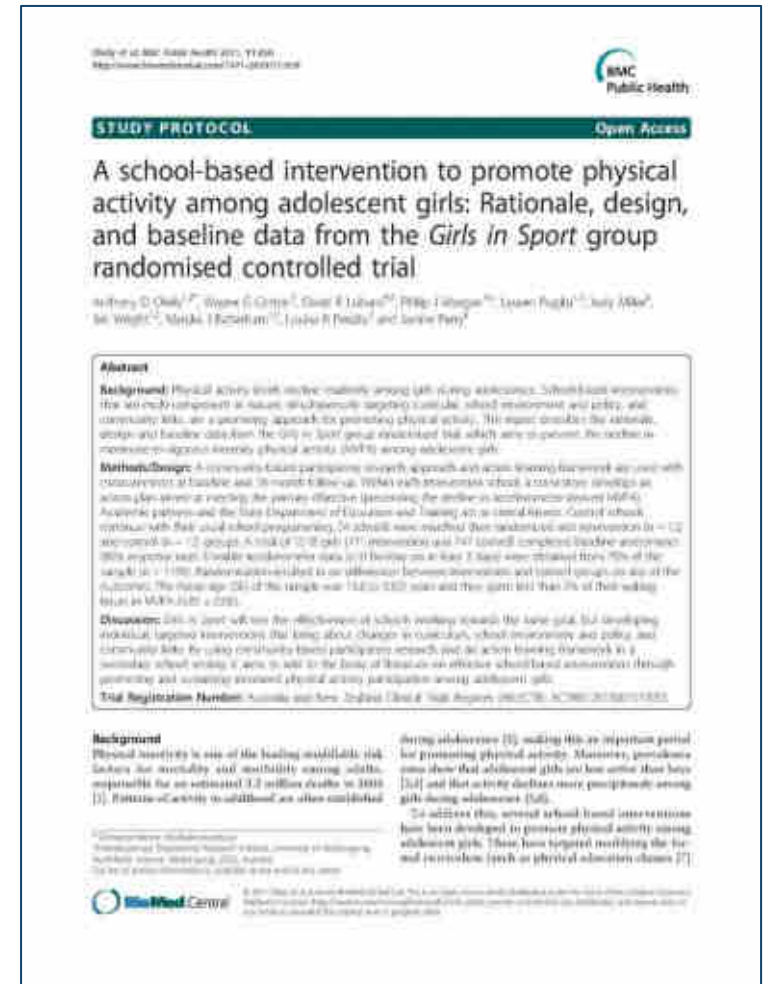




# Studies at the University of Sydney in partnership with others

## The Girls in Sport Project – Publications

- › A methods and baseline paper have been published
- › We are still waiting for the sign off to release the final results

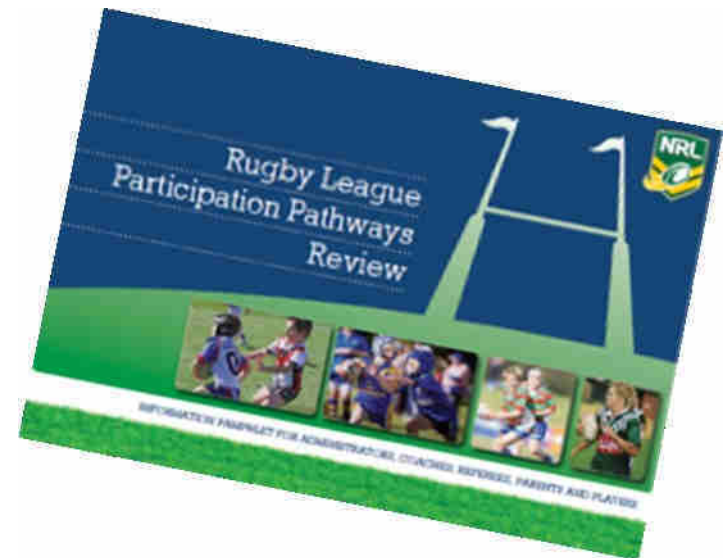




# Studies at the University of Sydney

## Replicating the Formula – systematic review, observation, intervention

- › We have just finished the similar process in Junior Sports Coaching:
  - Systematically reviewed the literature
  - Systemically observed over 190 junior coaching sessions across three sports
  - Conducted two control trial interventions
    1. Improving coaching sessions
    2. Rule changes in junior games which promote PA and skill development
  - Replicated this study in the UK





# Studies at the University of Sydney

## Replicating the Formula – systematic review, observation, intervention

- › We are just starting the process in:
  - Improving nutritional knowledge attitudes and practice in K-6 students
  - Developing effective teaching strategies in Outdoor Education





# Studies at the University of Sydney

## Other studies we are currently conducting

### › Profiling Olympic Athletes

- Finding Australia's most successful sporting town
- Developing an understanding why this town is so successful



### › Analyzing game play in Rugby 7s

- With the inclusion of Rugby 7s in the next Summer Olympics at greater understanding of what actually happens during the game is needed





# Questions

Any Questions...



[wayne.cotton@sydney.edu.au](mailto:wayne.cotton@sydney.edu.au)

# THE ROLE OF EXERCISE AND SPORT SCIENCES IN SPAIN: THE CONSEQUENCES ON EDUCATION (P.E.) AND SPORT (FUTSAL) ACHIEVEMENT

Yogyakarta State University

“International Seminar of Sport Culture and  
Achievement ISSCA 2014”

Dr. José Vicente García-Jiménez  
University of Murcia, Spain

## Before starting...

UNIVERSIDAD DE  
MURCIA

Dr. José Vicente García Jiménez – University of Murcia, Spain

### CV

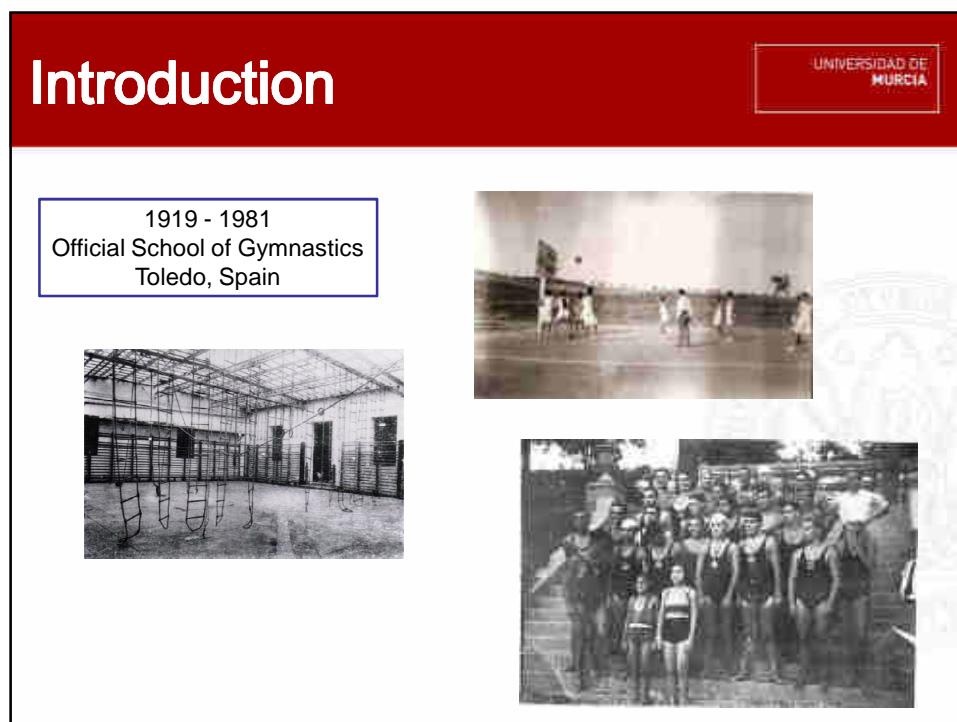
#### PROFESSIONAL EXPERIENCE

- 2008 – Present: **Associated teacher**. Faculty of Education. University of Murcia
  - Children physical training
  - Didactics of Physical Education
  - Innovation about Primary Physical Education
- 2010 – Present: **Physical Education Teacher**. San Buenaventura High School. Murcia
- 2004-2008. **Physical trainer**. Elpozo Murcia Futsal

#### RESEARCH LINES

- **Physiologic answers** during physical education lessons
- Obesity and intervention programs for children
- **Dehydration and fluid intake in futsal players** (Doctorate Thesis)








# Introduction

UNIVERSIDAD DE MURCIA

1998 - Present  
Faculty of Sport Sciences,  
University of Toledo, Spain



# Introduction

UNIVERSIDAD DE MURCIA

Official School of Gymnastics  
Toledo, Spain

Physical Education

**DEVELOPMENT OF EXERCISE AND SPORT  
SCIENCES IN SPAIN**



THE ROLE OF EXERCISE AND SPORT SCIENCES IN SPAIN: THE  
CONSEQUENCES ON EDUCATION (P.E.) AND SPORT (FUTSAL)  
ACHIEVEMENT

UNIVERSIDAD DE  
MURCIA

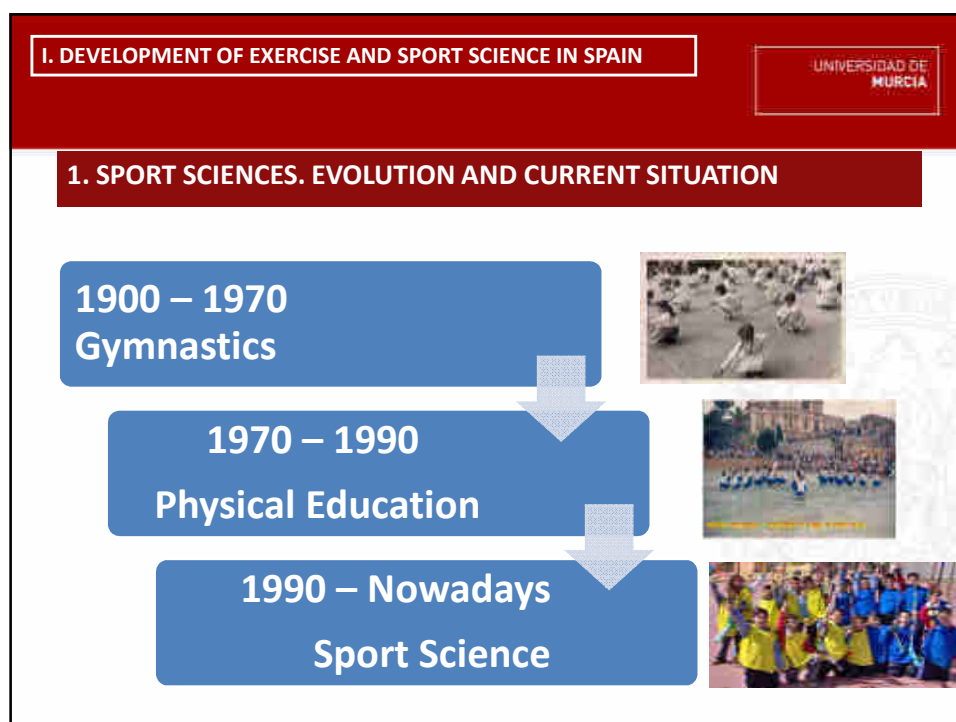
**CONTENTS:**

- DEVELOPMENT OF **SPORT SCIENCES** IN SPAIN
- SPORT SCIENCE IN EDUCATION: HEART RATE DURING **PHYSICAL EDUCATION** LESSONS. A CASE STUDY
- SPORT SCIENCE IN ELITE SPORT: **DEHYDRATION** IN ELITE FUTSAL PLAYERS
- CONCLUSIONS

**DEVELOPMENT OF EXERCISE AND  
SPORT SCIENCES IN SPAIN**



Dr. José Vicente García-Jiménez  
University of Murcia, Spain



I. DEVELOPMENT OF EXERCISE AND SPORT SCIENCE IN SPAIN

UNIVERSIDAD DE MURCIA

1. SPORT SCIENCES. EVOLUTION AND CURRENT SITUATION

## WHICH IS OUR NAME?

Human Movement Sciences

Physical Activity and Sports Sciences

Human Motor Skills

Sport Sciences

Physical Education and Sports

I. DEVELOPMENT OF EXERCISE AND SPORT SCIENCE IN SPAIN

UNIVERSIDAD DE MURCIA

1. SPORT SCIENCES. EVOLUTION AND CURRENT SITUATION

## WHICH IS OUR FIELD OF STUDY?

Physical Education?

Sport?

**Human movement**

Exercise?

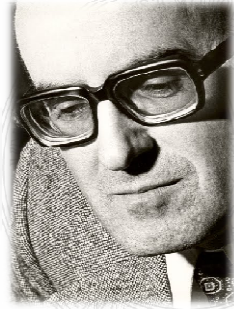
I. DEVELOPMENT OF EXERCISE AND SPORT SCIENCE IN SPAIN

UNIVERSIDAD DE MURCIA

1. SPORT SCIENCES. EVOLUTION AND CURRENT SITUATION

## Sport sciences in Spain

“sport, gymnastics, later physical education, represent a social phenomenon for humans, on the margins of the science... Today, **the study of the man in movement** is a new worry an scientific interest about a new are of the human behaviour”  
(José María Cagigal, 1996)



I. DEVELOPMENT OF EXERCISE AND SPORT SCIENCE IN SPAIN

UNIVERSIDAD DE MURCIA

1. SPORT SCIENCES. EVOLUTION AND CURRENT SITUATION

## WHICH ARE OUR OBJETIVES?

PRACTICAL OBJECTIVES



PHYSICAL EDUCATION



ELITE SPORT



PHYSICAL ACTIVITY AND HEALTH



SPORT-FOR-ALL PROMOTION



**I. DEVELOPMENT OF EXERCISE AND SPORT SCIENCE IN SPAIN**

UNIVERSIDAD DE MURCIA

**1. SPORT SCIENCES. EVOLUTION AND CURRENT SITUATION**

**SPORT SCIENCES IN SPAIN - SPECIFIC STUDY AREAS**

**1. SPORT AND PHYSICAL ACTIVITIES**

**2. PHYSICAL EDUCATION AND SPORT TEACHING**

**3. SOCIAL AND BEHAVIOUR SCIENCES**

**4. EXERCISE PHYSIOLOGY, DIRECTED TO HEALTH AND PERFORMANCE**

**5. BIOMECHANICS AND ERGONOMICS**

**6. ORGANIZATION AND SPORT PROMOTION**

**I. DEVELOPMENT OF EXERCISE AND SPORT SCIENCE IN SPAIN**

UNIVERSIDAD DE MURCIA

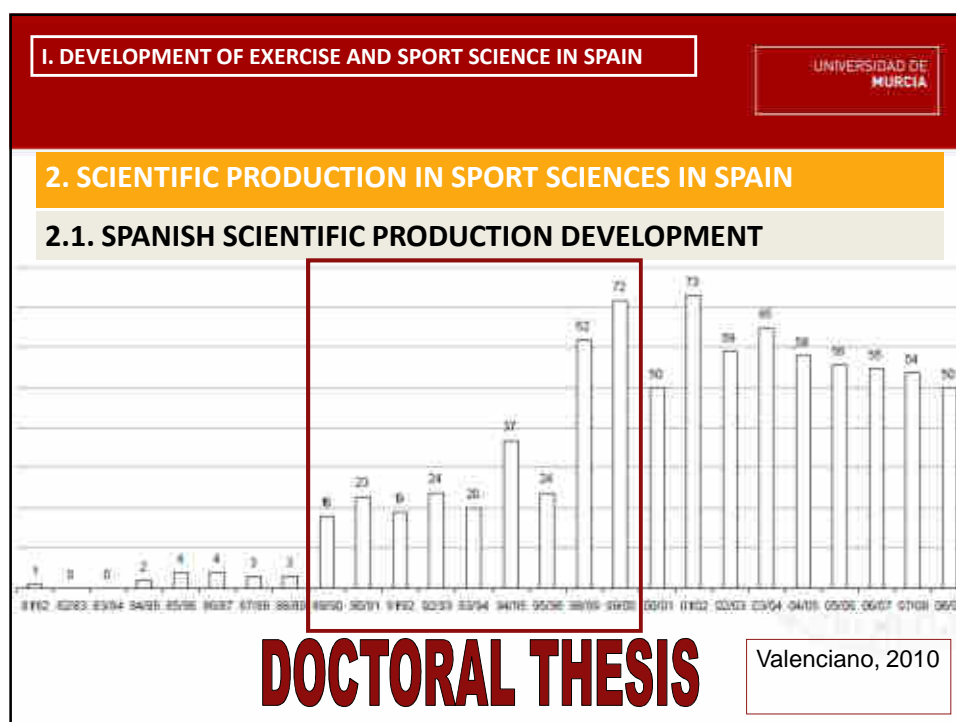
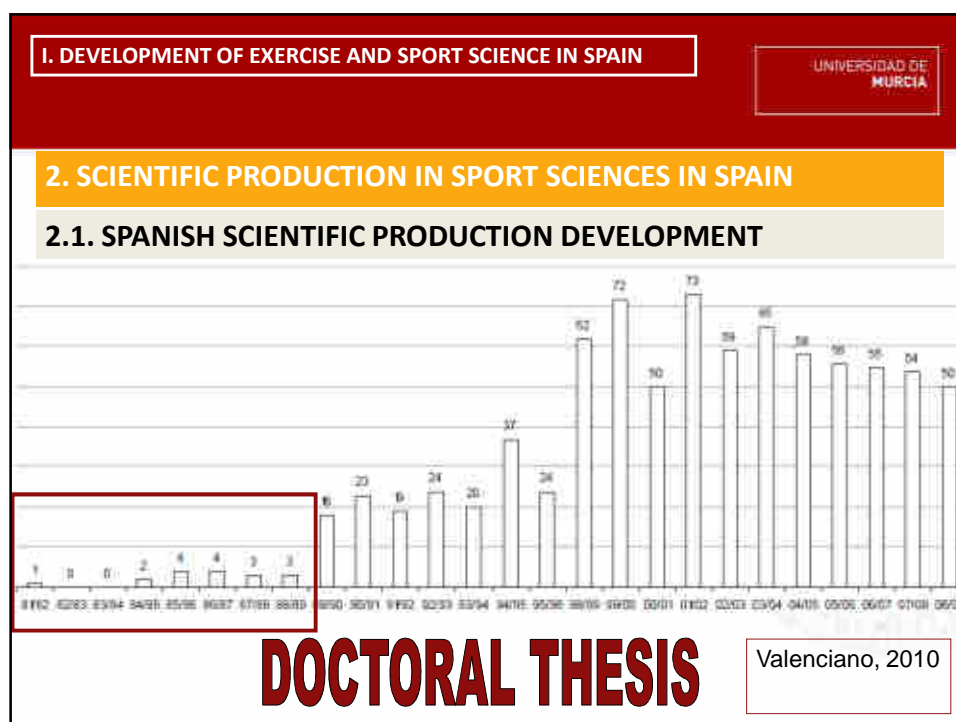
**2. SCIENTIFIC PRODUCTION IN SPORT SCIENCES IN SPAIN**

**2.1. SPANISH SCIENTIFIC PRODUCTION DEVELOPMENT**

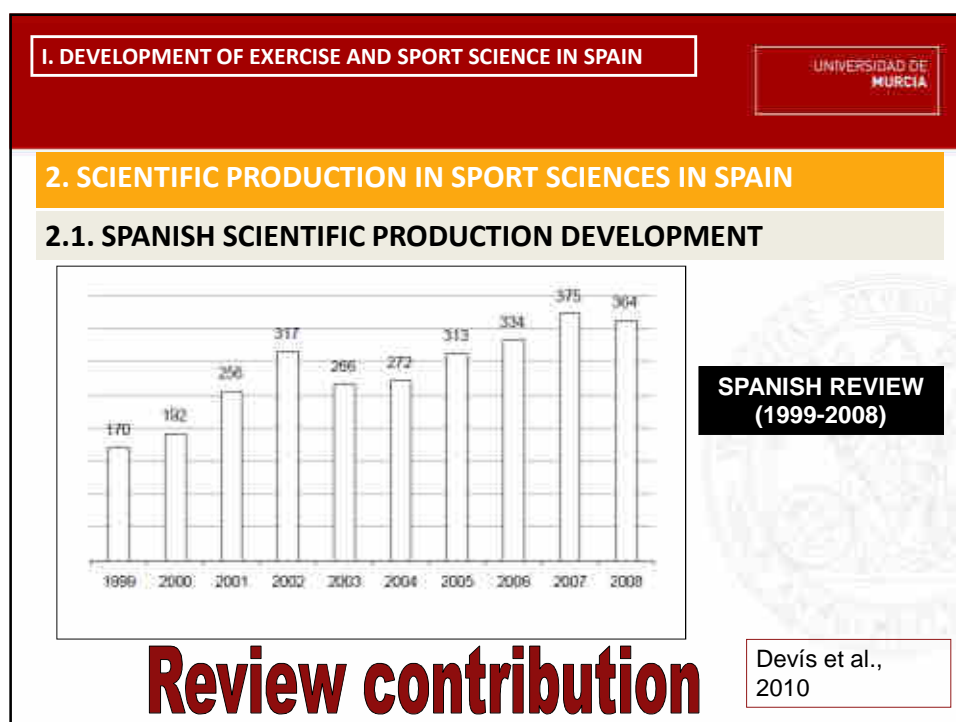
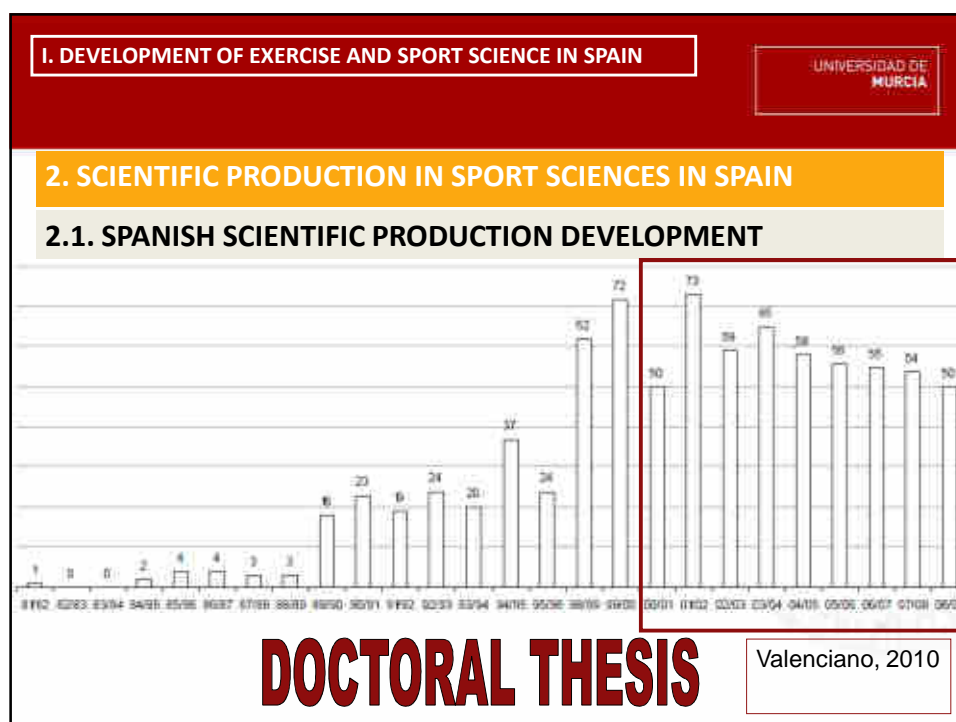
Year	Publications
1982	1
1983	1
1984	1
1985	2
1986	4
1987	4
1988	3
1989	3
1990	6
1991	23
1992	6
1993	24
1994	20
1995	37
1996	24
1997	52
1998	72
1999	73
2000	50
2001	54
2002	65
2003	58
2004	55
2005	55
2006	54
2007	50
2008	50
2009	50

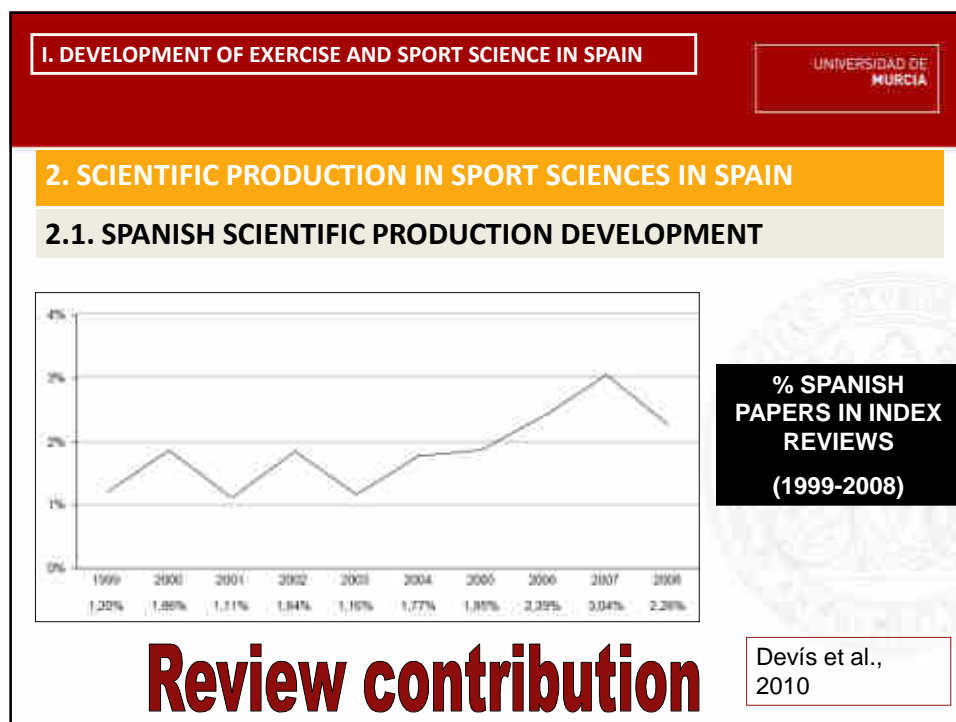
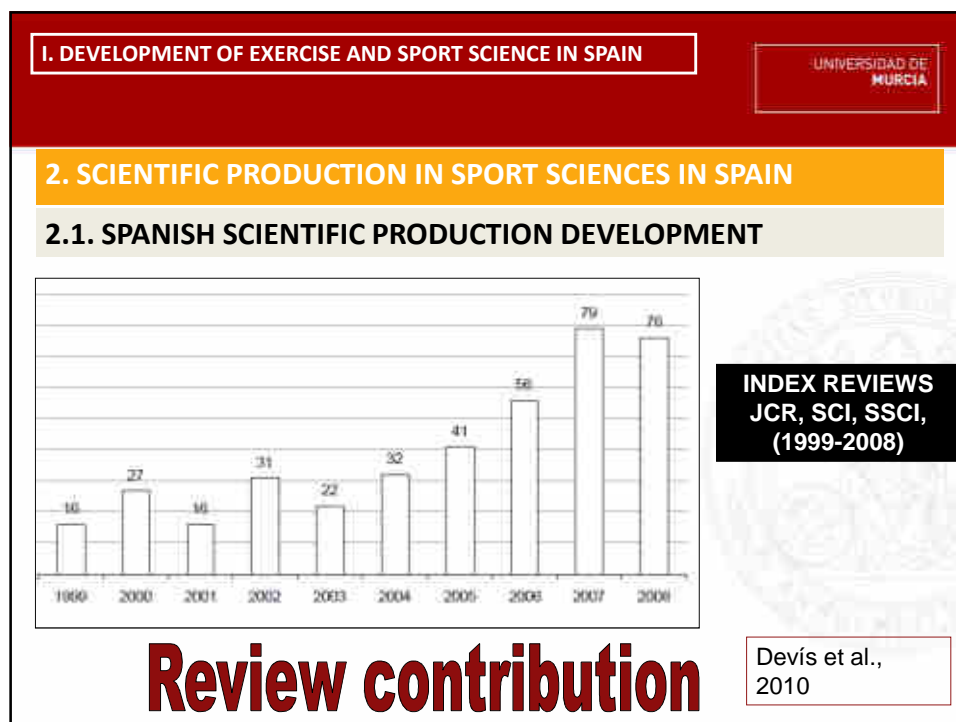
**DOCTORAL THESIS**

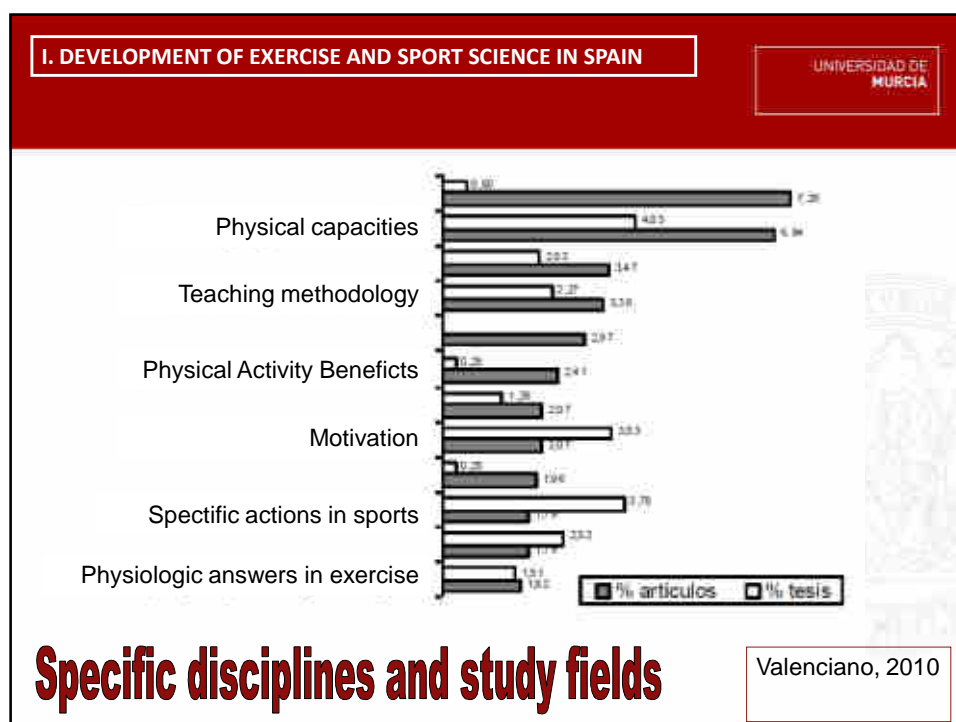
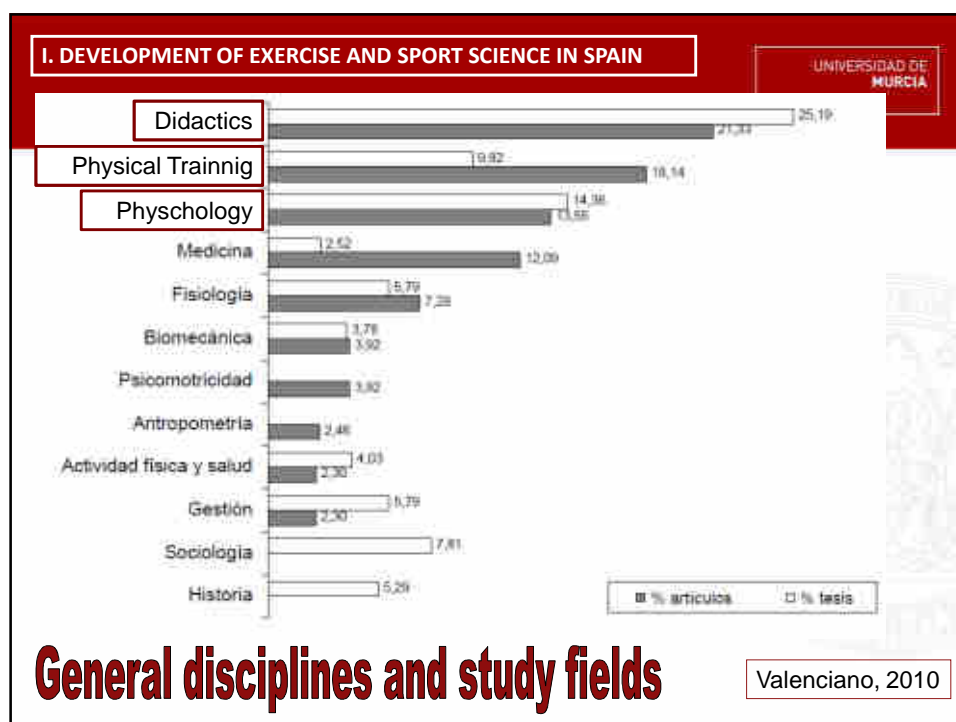
Valenciano, 2010











I. DEVELOPMENT OF EXERCISE AND SPORT SCIENCE IN SPAIN

UNIVERSIDAD DE MURCIA

3. CONCLUSIONS

- **INCREASE IN SCIENTIFIC PRODUCTION** IN MORE RECENT YEARS, IN DOCTORAL THESIS AS WELL AS PAPERS.
- INCREASE OF THE PUBLICATION IN **INDEXED REVIEWS**
- MAIN DISCIPLINES
  - DIDACTICS – PHYSICAL EDUCATION TEACHING
  - **PHYSICAL TRAINING**
  - PSYCHOLOGYS – BEHAVIOUR ANALYSIS
- MAIN SUBJECTS:
  - INJURIES
  - PHYSICAL CAPACITIES
  - **PHYSICAL EDUCATION CONTENTS**

I. DEVELOPMENT OF EXERCISE AND SPORT SCIENCE IN SPAIN

UNIVERSIDAD DE MURCIA

3. CONCLUSIONS

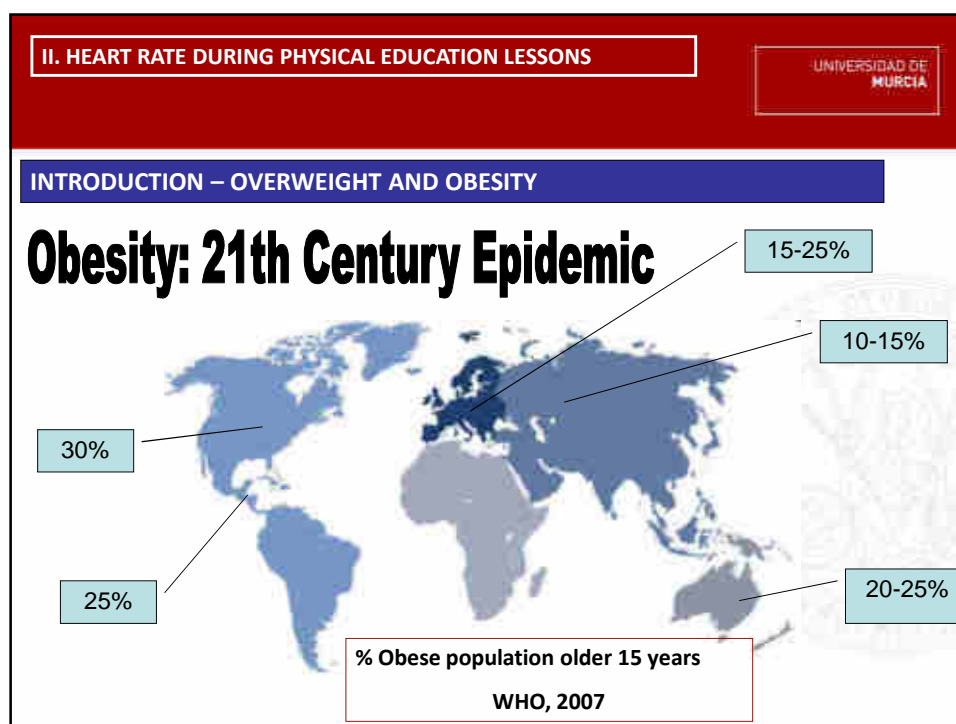
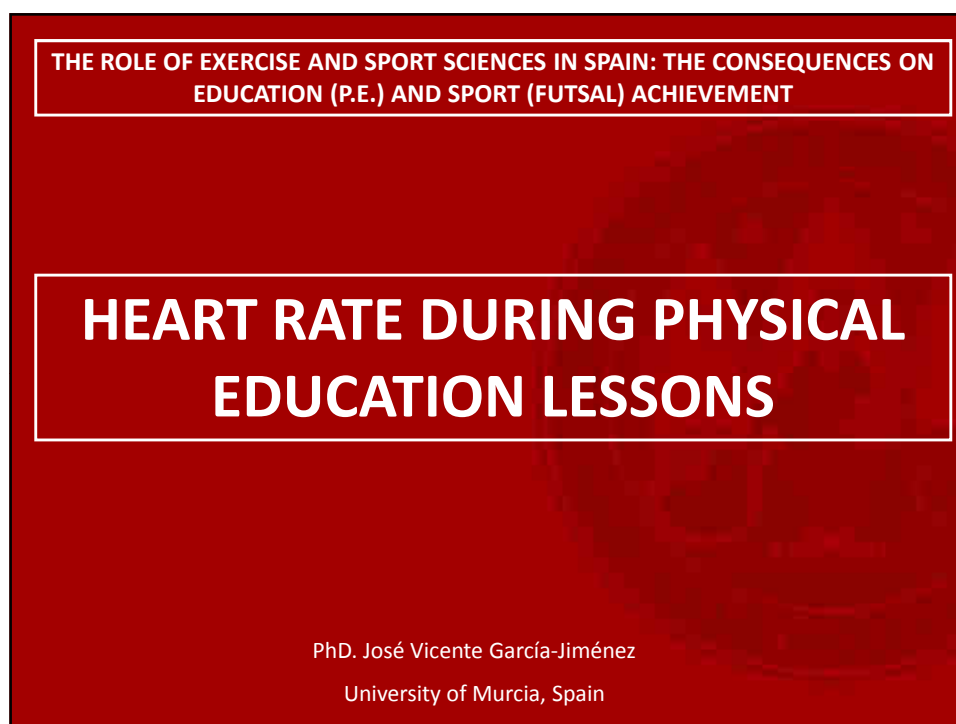
DEVELOPMENT OF EXERCISE AND SPORT SCIENCES IN SPAIN

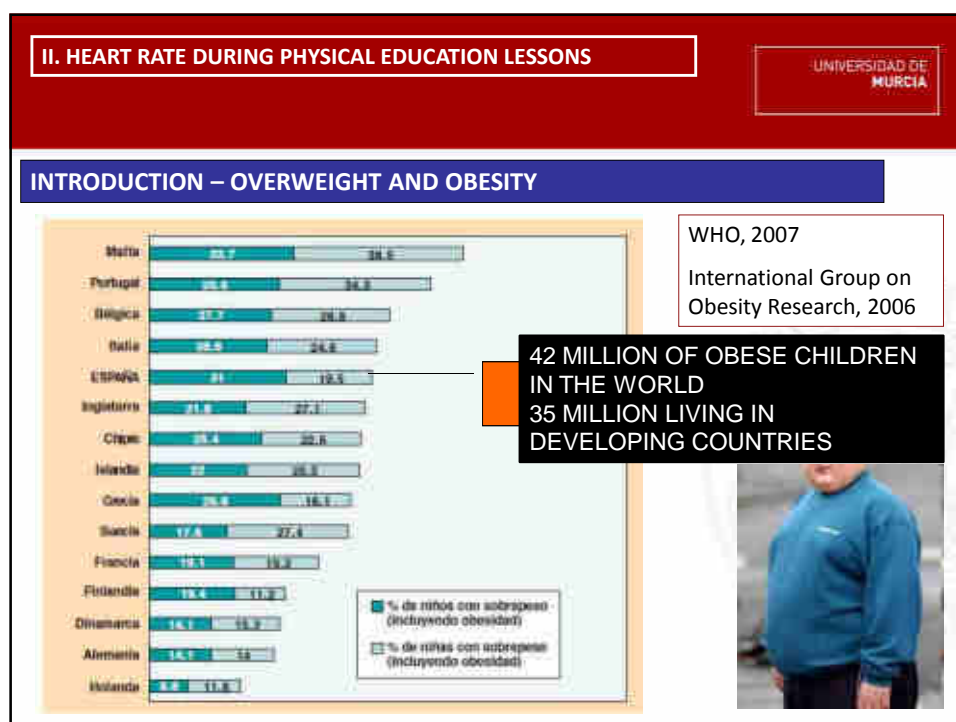
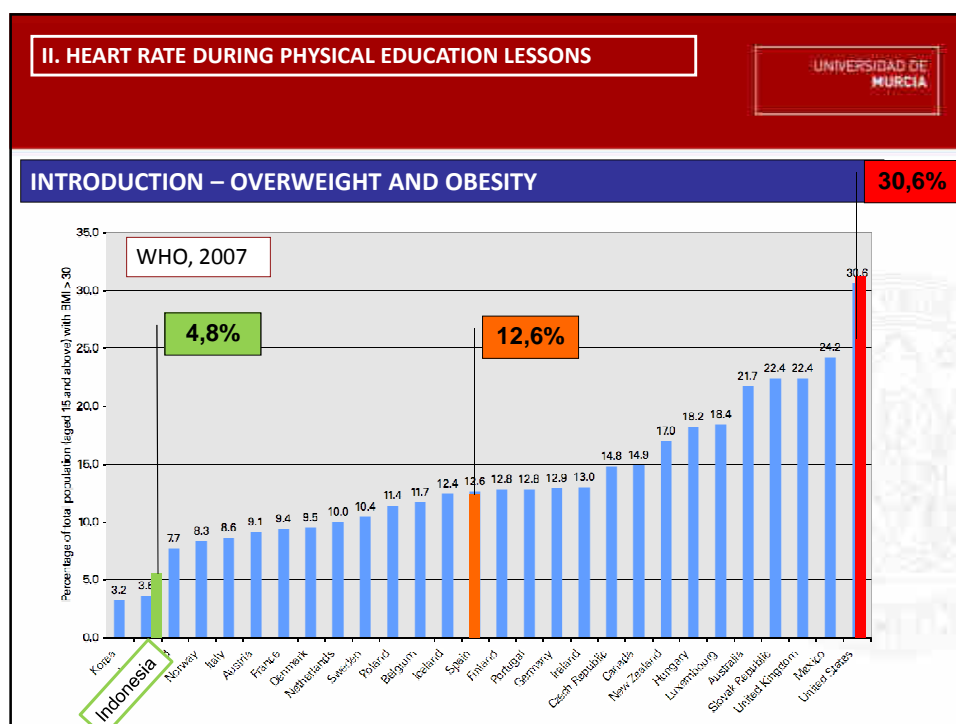
- INCREASE IN SCIENTIFIC PRODUCTION IN DOCTORAL THESIS
- INCREASE OF THE PUBLICATION IN INDEXED REVIEWS
- MAIN DISCIPLINES
  - DIDACTICS – PHYSICAL EDUCATION TEACHING
- MAIN SUBJECTS:
  - INJURIES
  - PHYSICAL CAPACITIES
  - PHYSICAL EDUCATION CONTENTS



PHYSICAL EDUCATION

ELITE SPORT





II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE MURCIA

INTRODUCTION – OVERWEIGHT AND OBESITY

**Fight against children and adolescent obesity**



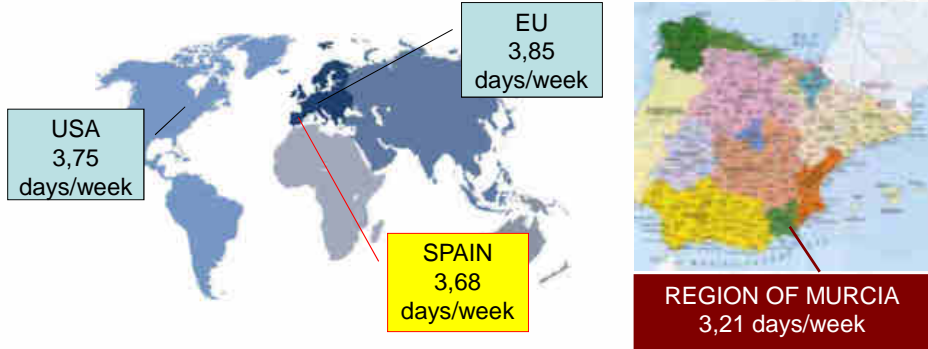
The image shows a visual equation: a circular photo of a young child eating a slice of watermelon, followed by a plus sign, and then another circular photo of a group of children playing a game of basketball outdoors. This visualizes the concept of fighting obesity through a combination of diet and physical activity.

II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE MURCIA

INTRODUCTION – ADOLESCENTS PHYSICAL ACTIVITY

- RECOMENDATIONS: EXERCISE DURING **5 DAYS PER WEEK**
- LAST YEARS: **REDUCTION** OF PHYSICAL ACTIVITY IN ADOLESCENTS



The figure consists of two maps. On the left is a world map with callouts for the USA (3,75 days/week), EU (3,85 days/week), and SPAIN (3,68 days/week). On the right is a map of Spain with a callout for the REGION OF MURCIA (3,21 days/week).

Region/Country	Physical Activity (days/week)
USA	3,75
EU	3,85
SPAIN	3,68
REGION OF MURCIA	3,21

Health Behaviour in School-Aged Children, 2009

García-Jiménez et al., 2008

II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE MURCIA

INTRODUCTION – ADOLESCENTS PHYSICAL ACTIVITY


**OFFICIAL RECOMENDATIONS:**

- **60 MINUTES** OF PHYSICAL ACTIVITY
- **5 DAYS** PER WEEK

Strong et al., 2005  
ACSM 2007, 2011

**COMPULSORY PHYSICAL ACTIVITY IN SPAIN:**

- **PHYSICAL EDUCATION** IN SPANISH EDUCATIVE SYSTEM
- **PRIMARY EDUCATION** (6-11 years): 3 SESSIONS AT WEEK (50 MINUTES)
- **SECONDARY EDUCATION** (12-16 years): 2 SESSIONS AT WEEK (50 MINUTES)



II. HEART RATE DURING PHYSICAL EDUCATION LESSONS


UNIVERSIDAD DE MURCIA

INTRODUCTION – ADOLESCENTS PHYSICAL ACTIVITY

**OFFICIAL RECOMENDATIONS:**

- **60 MINUTES** OF PHYSICAL ACTIVITY
- **5 DAYS** PER WEEK
- **INTENSITY:** MODERATE TO VIGOROUS PHYSICAL ACTIVITY (MVPA)

Strong et al., 2005  
ACSM 2007, 2011



INTENSITY	%HRR	%HRMAX	%VO <sub>2</sub> MAX	RPE
VERY LIGHT	< 30	< 57	< 37	< 9
LIGHT	30-39	57-63	37-45	9-11
MODERATE	40-59	64-76	46-63	12-13
VIGOROUS	60-89	77-95	64-90	14-17
NEAR-MAX	> 90	> 96	> 91	> 18




**HEART RATE DURING PHYSICAL EDUCATION LESSONS**
UNIVERSIDAD DE MURCIA

**INTRODUCTION – ADOLESCENTS PHYSICAL ACTIVITY**

**OFFICIAL RECOMENDATIONS:**

- **60 MINUTES** OF PHYSICAL ACTIVITY
- **5 DAYS** PER WEEK
- INTENSITY: MODERATE TO VIGOROUS PHSYCAL ACTIVITY (**MVPA**)

Strong et al., 2005  
ACSM 2007, 2011



INTENSITY	%HRR	%HRMAX	%VO <sub>2</sub> MAX	RPE
VERY LIGHT	< 30	< 57	< 37	< 9
LIGHT	30-39	57-63	37-45	9-11
<b>MODERATE</b>	<b>40-59</b>	<b>64-76</b>	<b>46-63</b>	<b>12-13</b>
VIGOROUS	60-89	77-95	64-90	14-17
NEAR-MAX	> 90	> 96	> 91	> 18

**MVPA: IMPROVE CDV RESISTANCE / INTENSITY FOR WEIGHT CONTROL**

**HEART RATE DURING PHYSICAL EDUCATION LESSONS**
UNIVERSIDAD DE MURCIA

**INTRODUCTION – INTENSITY OF PHYSICAL EDUCATION LESSONS**


**OFFICIAL RECOMENDATIONS:**

- **50% OF LESSON TIME** IN MVPA

Sallys and Patrick, 1993  
Aznar and Webster, 2006  
Howe et al., 2012

**U.S. PUBLIC HEALTH SERVICE (2000)**

- RESEARCH ABOUT INTENSITY DURING PHYSICAL EDUCATION LESSONS (PRIMARY AND HIGH SCHOOL)
- 50-60% OF LESSON TIME IN **REST OR VERY LIGHT PHYSICAL ACTIVITY**




**II. HEART RATE DURING PHYSICAL EDUCATION LESSONS**
UNIVERSIDAD DE MURCIA

**INTRODUCTION – INTENSITY OF PHYSICAL EDUCATION LESSONS**

**HOW TO ESTABLISH THE INTENSITY OF PHYSICAL EDUCATION LESSONS?**

**HEART RATE MONITORS**

- DURANT ET AL., 1993
- STRATTON, 1993
- SIRARD AND PATE, 2001
- EUKELUND ET AL., 2001
- AZNAR AND WEBSTER, 2006
- DUNCAN ET AL., 2009
- ACSM, 2011



**II. HEART RATE DURING PHYSICAL EDUCATION LESSONS**
UNIVERSIDAD DE MURCIA

**INTRODUCTION – INTENSITY OF PHYSICAL EDUCATION LESSONS**

AUTHORS	COUNTRY	N	AGE GROUP	% MVPA	TIME MVPA
Stratton (1996)	England	177	9-15	32.7%	
Wang et al. (2004)	Portugal	28	13	30%	
Fairclough and Stratton, (2005)	England	122	11-14	34.3%	17.5 min.
Gao et al. (2009)	U.S.A.	146	10-14	55.43%	
Marques et al. (2011)	Portugal	56	10-14	58%	
Dudley et al. (2011)	Australia	586	15	56.9%	37.6 min.
Sarradel et al. (2011)	Spain	37	14	39.25%	33.6 min.

II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE MURCIA

INTRODUCTION – INTENSITY OF PHYSICAL EDUCATION LESSONS

AUTHORS	COUNTRY	N	AGE GROUP	% MVPA	TIME MVPA
Stratton (1996)	England	177	9-15	32.7%	
Wang et al. (2004)	Portugal	28	13	30%	
Fairclough and Stratton, (2005)	England	122	11-14	34.3%	17.5 min.
<b>Gao et al. (2009)</b>	U.S.A.	146	10-14	<b>55.43%</b>	
<b>Marques et al. (2011)</b>	Portugal	56	10-14	<b>58%</b>	
<b>Dudley et al. (2011)</b>	Australia	586	15	<b>56.9%</b>	37.6 min.
Sarradel et al. (2011)	Spain	37	14	39.25%	33.6 min.

**OFFICIAL RECOMENDATIONS:**

- 50% OF LESSON TIME IN MVPA

II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE MURCIA

INTRODUCTION – INTENSITY OF PHYSICAL EDUCATION LESSONS

AUTHORS	COUNTRY	N	AGE GROUP	% MVPA	TIME MVPA
Stratton (1996)	England	177	9-15	32.7%	
Wang et al. (2004)	Portugal	28	13	30%	
Fairclough and Stratton, (2005)	England	122	11-14	34.3%	17.5 min.
Gao et al. (2009)	U.S.A.	146	10-14	55.43%	
Marques et al. (2011)	Portugal	56	10-14	58%	
Dudley et al. (2011)	Australia	586	15	56.9%	37.6 min.
<b>Sarradel et al. (2011)</b>	<b>Spain</b>	<b>37</b>	<b>14</b>	<b>39.25%</b>	<b>33.6 min.</b>

**II. HEART RATE DURING PHYSICAL EDUCATION LESSONS**

UNIVERSIDAD DE MURCIA

**OBJECTIVES:**

- ✓ TO MEASURE **THE INTENSITY** OF PHYSICAL EDUCATION LESSONS IN REGION OF MURCIA (SPAIN), USING HEART RATE MONITORS
- ✓ TO ESTABLISH STUDENTS' TIME SPENT IN **MVPA**
- ✓ TO ANALYZE DIFFERENCES IN MVPA RESULTS IN RELATION TO **GENDER AND SESION TYPE**


**II. HEART RATE DURING PHYSICAL EDUCATION LESSONS**


UNIVERSIDAD DE MURCIA

**METHODS - PARTICIPANTS**

**182 ADOLESCENTS**

- 97 BOYS AND 85 GIRLS
- 12-17 YEARS OLD
- **SEVEN PUBLIC HIGH SCHOOLS** FROM REGION OF MURCIA (SPAIN)
- SELECTED RANDOMLY FROM A POPULARION OF 211 STUDENTS







II. HEART RATE DURING PHYSICAL EDUCATION LESSONS
UNIVERSIDAD DE MURCIA

**METHODS - PROCEDURES**


ANTHROPOMETRIC VALUES




Tanita BC-350  
**WEIGHT**



Tanita HR-001  
**HEIGHT**



Holtain Tanner  
**FAT PERCENT**




Slaughter et al., 1988

II. HEART RATE DURING PHYSICAL EDUCATION LESSONS
UNIVERSIDAD DE MURCIA

**METHODS - PROCEDURES**

HEART RATE VALUES



**RESTING HEAR RATE**

INTENSITY	%HRR
VERY LIGHT	<30
LIGHT	30-39
<b>MVPA</b>	<b>40-59</b>
VPA	60-89
NEAR-MAX	>90

**RELATIVE INTENSITY**

Fairclough and Stratton, 2005

Wilmore and Costill, 2006  
ACSM, 2011

II. HEART RATE DURING PHYSICAL EDUCATION LESSONS



UNIVERSIDAD DE MURCIA


METHODS - PROCEDURES

INTENSITY OF PHYSICAL EDUCATION LESSON

**HEAR RATE ACTIVITY**

- FROM THE BEGINNING TO THE END OF LESSON
- TEACHERS ALMOST 5 YEARS OF TEACHING EXPERIENCE




II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE MURCIA

METHODS - PROCEDURES

INTENSITY OF PHYSICAL EDUCATION LESSON



II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

**METHODS - PROCEDURES**

**INTENSITY OF PHYSICAL EDUCATION LESSON**

**HEAR RATE ACTIVITY**

- FROM THE BEGINNING TO THE END OF LESSON
- TEACHERS ALMOST 5 YEARS OF TEACHING EXPERIENCE

Team Sports

Individual Sports

Traditional Games

Dance

II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

**RESULTS**

	Boys (n=97)				Girls (n=85)				All (n=182)			
	Mean	SD	Confidence interval (95%)		Mean	SD	Confidence interval (95%)		Mean	SD	Confidence interval (95%)	
			Lower	Upper			Lower	Upper			Lower	Upper
Mean FC (beat/min)	130.02	16.85	126.5	133.45	134.76	19.28	130.58	138.95	132.25 <sup>ns</sup>	18.13	129.57	134.92
PE Time MVPA (min)	8.26	5.83	7.08	9.45	9.70	5.97	8.40	11.00	8.94 <sup>ns</sup>	5.92	8.06	9.81
PE Percent MVPA (%)	19.99	14.10	17.12	22.87	23.47	14.45	20.33	26.60	21.62 <sup>ns</sup>	14.33	19.51	23.74

## II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE  
MURCIA

### RESULTS – INTENSITY OF PHYSICAL EDUCATION LESSONS

	Boys (n=97)	Girls (n=85)	All (n=182)						
	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)

## II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE  
MURCIA

### RESULTS – INTENSITY OF PHYSICAL EDUCATION LESSONS

	Boys (n=97)	Girls (n=85)	All (n=182)									
	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)			
			Lower	Upper			Lower	Upper	Lower	Upper		
Mean FC (beat/min)	130.02	16.85	126.5	133.45	134.76	19.28	130.58	138.95	132.25 <sup>ns</sup>	18.13	129.57	134.92
PE Time MVPA (min)	8.26	5.83	7.08	9.45	9.70	5.97	8.40	11.00	8.94 <sup>ns</sup>	5.92	8.06	9.81
PE Percent MVPA (%)	19.99	14.10	17.12	22.87	23.47	14.45	20.33	26.60	21.62 <sup>ns</sup>	14.33	19.51	23.74



## II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE  
MURCIA

### RESULTS – INTENSITY OF PHYSICAL EDUCATION LESSONS

	Boys (n=97)	Girls (n=85)	All (n=182)						
	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)
			Lower Upper			Lower Upper			Lower Upper
Mean FC (beat/min)	130.02	16.85	126.50 133.45	134.76	19.28	130.58 138.95	132.25 <sup>ns</sup>	18.13	129.57 134.92
PE Time MVPA (min)	8.26	5.83	7.08 9.45	9.70	5.97	8.40 11.00	8.94 <sup>ns</sup>	5.92	8.06 9.81
PE Percent MVPA (%)	19.99	14.10	17.12 22.87	23.47	14.45	20.33 26.60	21.62 <sup>ns</sup>	14.33	19.51 23.74

**OFFICIAL RECOMENDATIONS:**  
• 50% OF LESSON TIME IN MVPA

**OFFICIAL RECOMENDATIONS:**  
• 50% OF LESSON TIME IN MVPA

## II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE  
MURCIA

### RESULTS – GENDER DIFFERENCES

	Boys (n=97)				Girls (n=85)				All (n=182)			
	Mean	SD	Confidence interval (95%)		Mean	SD	Confidence interval (95%)		Mean	SD	Confidence interval (95%)	
			Lower	Upper			Lower	Upper			Lower	Upper
Mean FC (beat/min)	130.02	16.85	126.5	133.45	134.76	19.28	130.58	138.95	132.25 <sup>ns</sup>	18.13	129.57	134.92
PE Time MVPA (min)	8.26	5.83	7.08	9.45	9.70	5.97	8.40	11.00	8.94 <sup>ns</sup>	5.92	8.06	9.81
PE Percent MVPA (%)	19.99	14.10	17.12	22.87	23.47	14.45	20.33	26.60	21.62 <sup>ns</sup>	14.33	19.51	23.74

## II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

UNIVERSIDAD DE  
MURCIA

### RESULTS – GENDER DIFFERENCES

	Boys (n=97)	Girls (n=85)	All (n=182)									
	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)			
			Lower	Upper			Lower	Upper			Lower	Upper
Mean FC (beat/min)	130.02	16.85	126.5	133.45	134.76	19.28	130.58	138.95	132.25 <sup>ns</sup>	18.13	129.57	134.92
PE Time MVPA (min)	8.26	5.83	7.08	9.45	9.70	5.97	8.40	11.00	8.94 <sup>ns</sup>	5.92	8.06	9.81
PE Percent MVPA (%)	19.99	14.10	17.12	22.87	23.47	14.45	20.33	26.60	21.62 <sup>ns</sup>	14.33	19.51	23.74

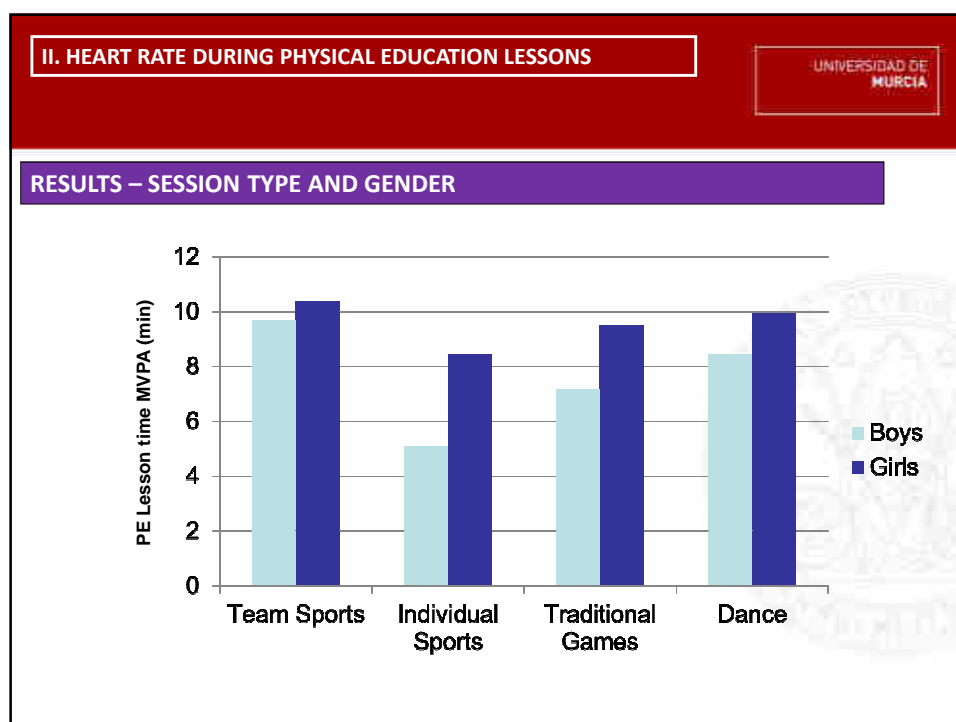
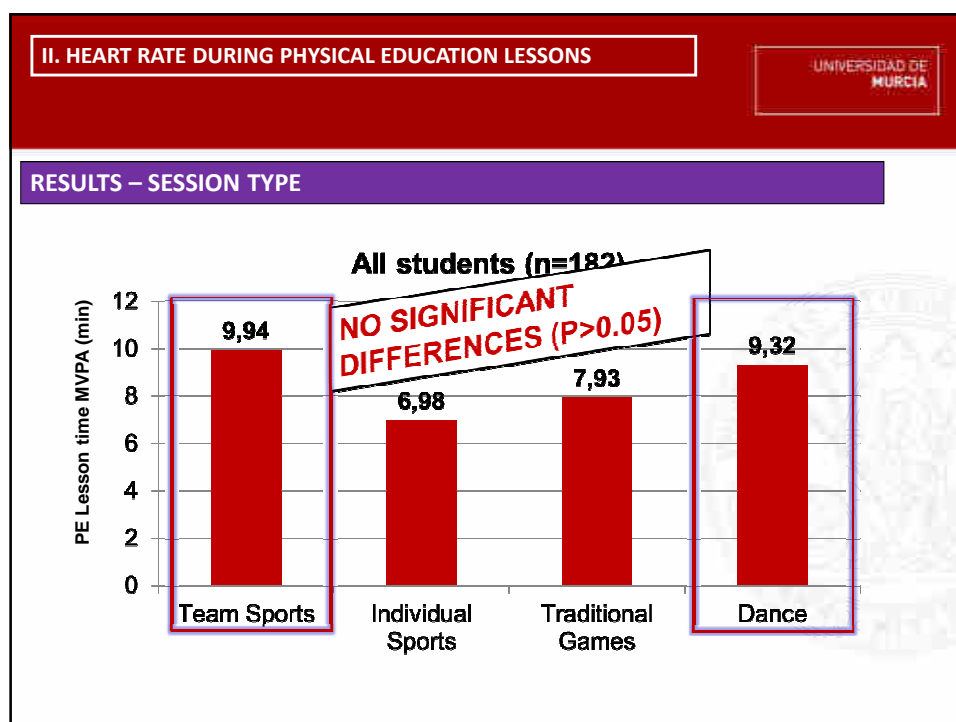
## II. HEART RATE DURING PHYSICAL EDUCATION LESSONS

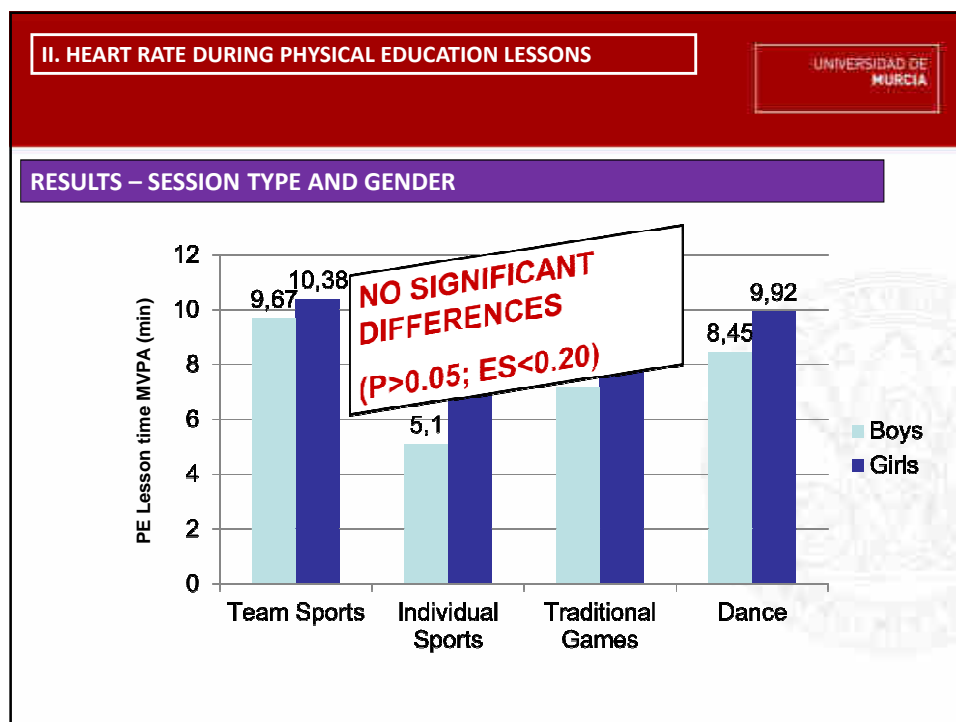
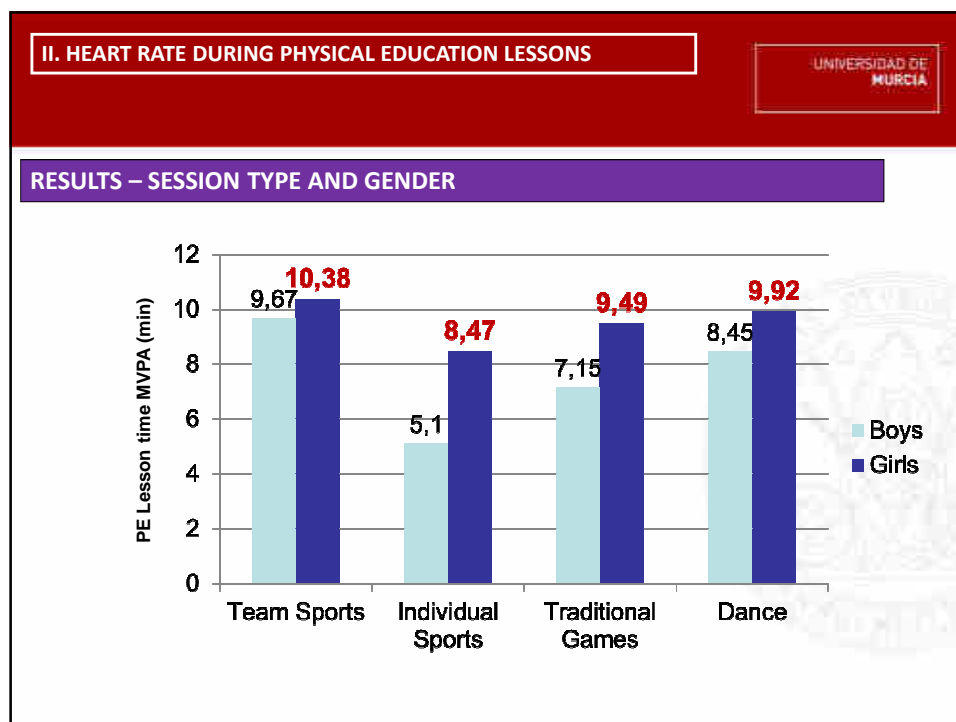
UNIVERSIDAD DE  
MURCIA

### RESULTS – GENDER DIFFERENCES

	Boys (n=97)	Girls (n=85)	All (n=182)						
	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)	Mean	SD	Confidence interval (95%)
			Lower Upper			Lower Upper			Lower Upper
Mean FC (beat/min)	130.02	16.85	126.5 133.45	134.76	19.28	130.58 138.95	132.25 <sup>ns</sup>	18.13	129.57 134.92
PE Time MVPA (min)	8.26	5.83	7.08 9.45	9.70	5.97	8.40 11.00	8.94 <sup>ns</sup>	5.92	8.06 9.81
PE Percent MVPA (%)	19.99	14.10	17.12 22.87	23.47	14.45	20.33 26.60	21.62 <sup>ns</sup>	14.33	19.51 23.74







**II. HEART RATE DURING PHYSICAL EDUCATION LESSONS**

UNIVERSIDAD DE MURCIA

**CONCLUSIONS**


- ❑ INTENSITY OF ANALYZED PHYSICAL EDUCATION LESSONS **IS INSUFFICIENT** TO IMPROVE CARDIOVASCULAR WORK OF STUDENTS
- ❑ THERE WERE NO SIGNIFICANT DIFFERENCES IN MVPA RESULTS IN RELATION TO **STUDENTS GENDER**
- ❑ **TEAM SPORTS** AND DANCE CAN IMPROVE MVPA RESULTS

**II. HEART RATE DURING PHYSICAL EDUCATION LESSONS**

UNIVERSIDAD DE MURCIA

**FUTURE RESEARCHES**

- **FUN PERCEPTION** IN RELATION TO GENDER
- RELATION BETWEEN **FAT PERCENT** AND INTENSITY OF LESSONS
- RELATION BETWEEN FAT PERCENT AND FUN PERCEPTION
- **TEACHERS METODOLOGY** AND INTENSITY OF LESSONS
- TEACHERS METODOLOGY AND FUN PERCEPTION



THE ROLE OF EXERCISE AND SPORT SCIENCES IN SPAIN: THE CONSEQUENCES ON  
EDUCATION (P.E.) AND SPORT (FUTSAL) ACHIEVEMENT

**DEHYDRATION AND FLUID  
BALANCE IN ELITE FUTSAL  
PLAYERS DURING OFFICIAL  
COMPETITION**

PhD. José Vicente García-Jiménez  
University of Murcia, Spain

III. DEHYDRATION IN ELITE FUTSAL PLAYERS

UNIVERSIDAD DE MURCIA

**1. FUTSAL CHARACTERISTICS**



Diameter: 62-64 cm  
Weight: 400-440 gr.  
Pressure: 0,4-0,6 atm.




Diameter: 68-70 cm  
Weight: 410-450 gr.  
**Pressure: 0,4-1,1 atm.**

III. DEHYDRATION IN ELITE FUTSAL PLAYERS

UNIVERSIDAD DE MURCIA

1. FUTSAL CHARACTERISTICS



- ❑ 2 PERIODS OF 20 MINUTES
- ❑ 10 MINUTES BREAK
- ❑ 1 MINUTE TIME OUT PER PERIOD

III. DEHYDRATION IN ELITE FUTSAL PLAYERS


UNIVERSIDAD DE MURCIA

1. FUTSAL CHARACTERISTICS

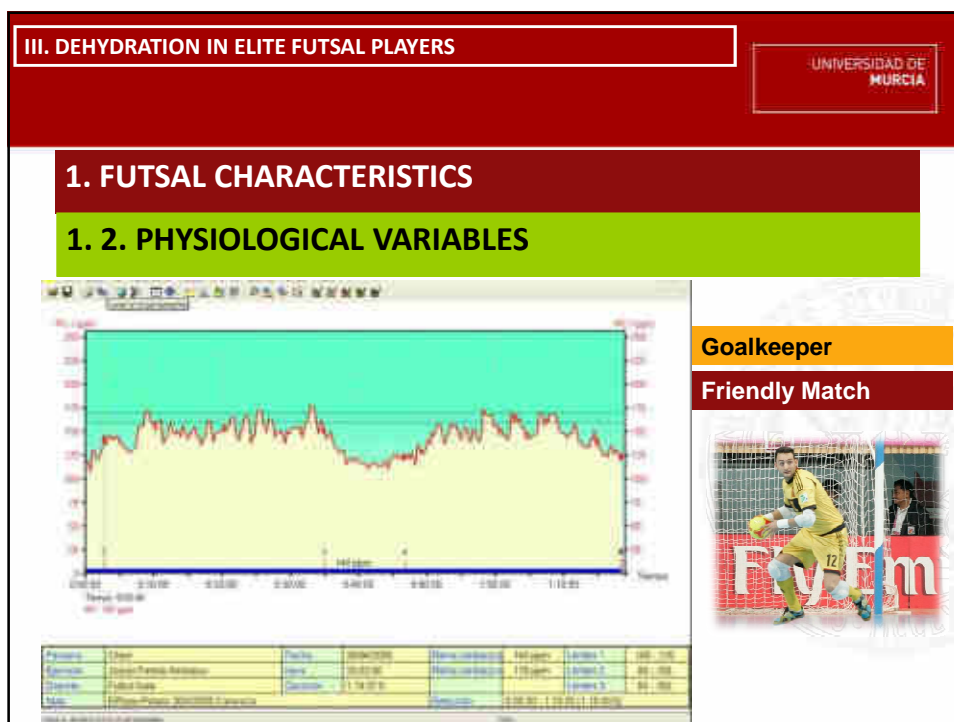
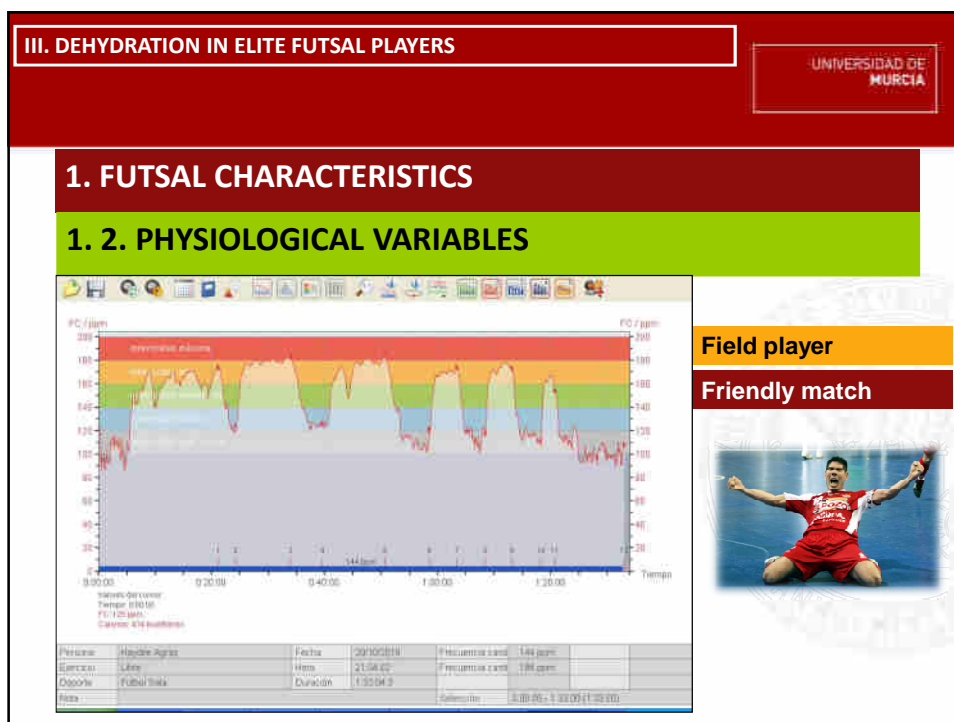
**FUTSAL: HIIE SPORT (HIGH INTERMITENT INTENSITY SPORT)**

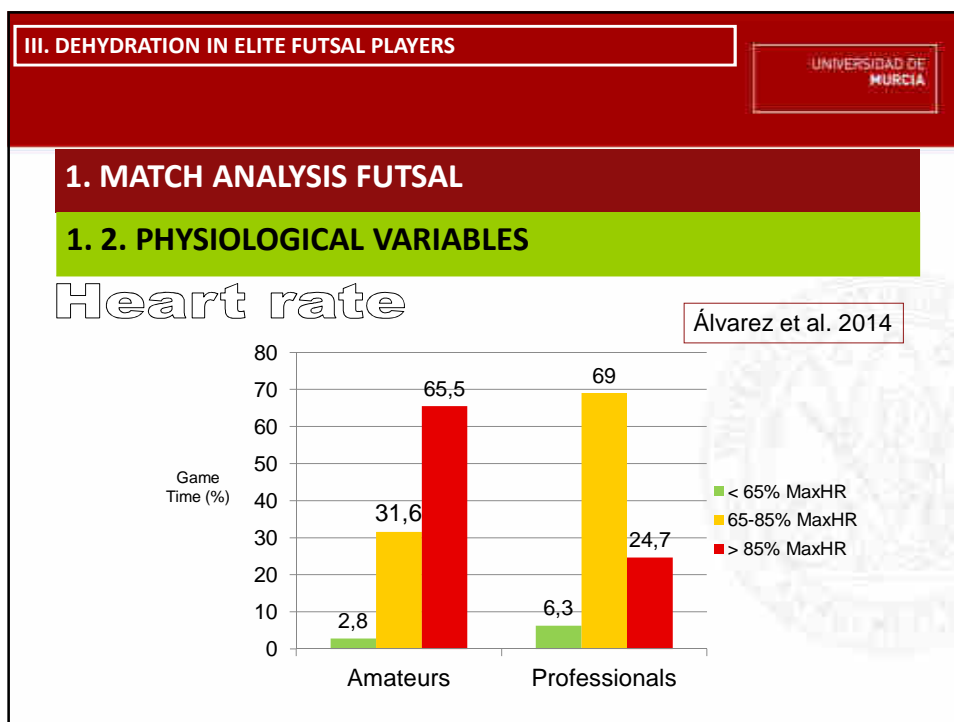
- MAXIMUM INTENSITY ACTIONS WITH VARIABLE DURATION
- RECOVERY PERIODS WITH VARIABLE DURATION
- GAME TIME RELATIVELY LONG
- AEROBIC AND ANAEROBIC METABOLISM

Barbero, 2003









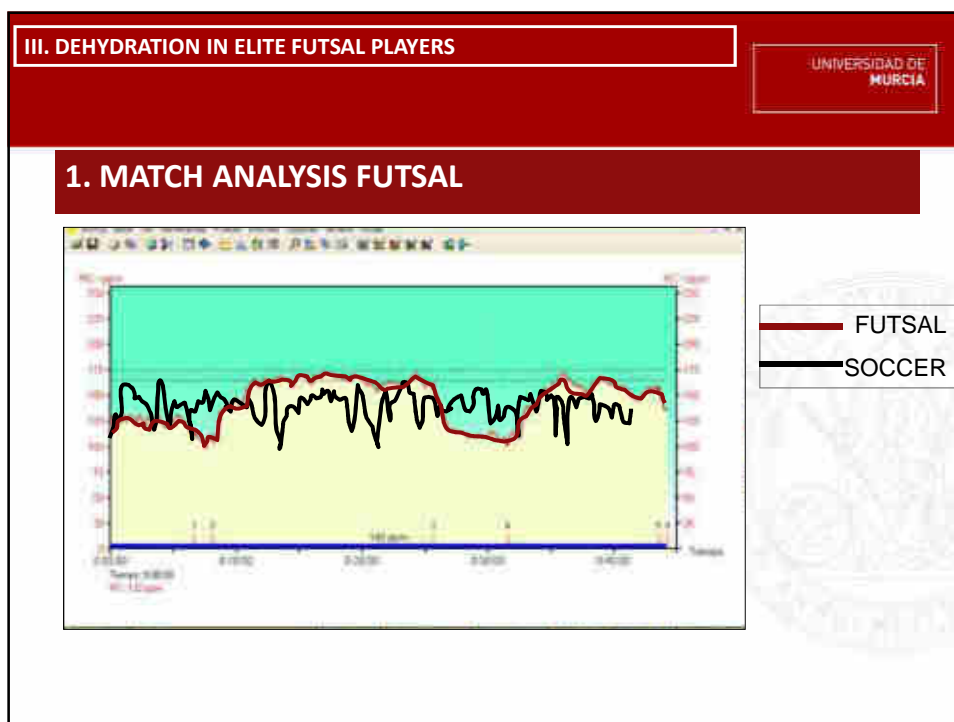
III. DEHYDRATION IN ELITE FUTSAL PLAYERS

UNIVERSIDAD DE MURCIA

1. MATCH ANALYSIS FUTSAL

PHYSICAL VARIABLES	FUTSAL	SOCCER
Game time	40' (75-85')	65-70' (90')
Covered distance	6 km (FP) 3 km (GK)	10-12 km (FP) 3-5 km (GK)
Intensity of efforts	Max: 9% High: 14% Medium: 29% Low: 48%	Máx: 5% High: 10% Medium: 25% Low: 50%

III. DEHYDRATION IN ELITE FUTSAL PLAYERS		
UNIVERSIDAD DE MURCIA		
1. MATCH ANALYSIS FUTSAL		
PHYSIOLOGICAL VARIABLES	FUTSAL	SOCCER
HEART RATE	75-90% MAX HR	75-85% MAX HR
BLOOD LACTATE	6-9 mmol/l	4-6 mmol/l
VO2MAX	50-55 ml/kg/min	60-65 ml/kg/min



**Disidratazione a futsal per la competizione ufficiale**

UNIVERSIDAD DE MURCIA

**2. DEHYDRATION IN ELITE FUTSAL PLAYERS**

How can dehydration affect elite futsal players performance?

**INTRODUCTION** OBJECTIVES HYPOTHESIS MATERIAL AND METHODS RESULTS AND DISCUSSION CONCLUSIONS

UNIVERSIDAD DE MURCIA

**Athletes**


- Insufficient fluid intake
- Progressive dehydration

Cox et al., 2002; Maughan et al., 2004

**Dehydration and performance**

- Aerobic capacity reduction
- Recovery reduction
- Strength reduction
- Cognitive function reduction

Sawka et al., 2007; Palacios et al., 2008



<b>INTRODUCTION</b>	<b>OBJECTIVES</b>	<b>HYPOTHESIS</b>	<b>MATERIAL AND METHODS</b>	<b>RESULTS AND DISCUSSION</b>	<b>CONCLUSIONS</b>	UNIVERSIDAD DE MURCIA
---------------------	-------------------	-------------------	-----------------------------	-------------------------------	--------------------	-----------------------

## Differences between training and competition

Cox et al., 2002; Castagna et al., 2009

**It is important to attend to players hydric needs**

**To weight before and after physical activity in order to know:**

- Percentage of weight loss
- Dehydration


Maughan y Gleeson., 2004; Murray, 2007; Sawka et al., 2007; Palacios et al., 2008






<b>INTRODUCTION</b>	<b>OBJECTIVES</b>	<b>HYPOTHESIS</b>	<b>MATERIAL AND METHODS</b>	<b>RESULTS AND DISCUSSION</b>	<b>CONCLUSIONS</b>	UNIVERSIDAD DE MURCIA
---------------------	-------------------	-------------------	-----------------------------	-------------------------------	--------------------	-----------------------


Sawka et al., 2007; Palacios et al., 2008


% Weight loss	Effects
1%	Cardiac work increase Aerobic performance reduction in warm climates
2%	Powerful thirst, physical discomfort, appetite reduction. Mental and cognitive performance reduction
3%	Blood volume reuction Increase of the risk of muscle damage and faintings. Reduction of reaction time, concentration and perceptive attention.
4%	Muscle strenght reduction. Nauseas
5%	Increase of the corporal temperature to 39° Fast performance reduction Rápida disminución del rendimiento. High risk of muscular damage.
6%	Reduction and fail of termoregulatory system.




INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS	
						
<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">Sawka et al., 2007; Palacios et al., 2008</div>						
% Weight loss	Effects					
1%	<b>Cardiac work increase</b> <b>Aerobic performance reduction in warm climates</b>					
2%	Powerful thirst, physical discomfort, appetite reduction. Mental and cognitive performance reduction					
3%	Blood volume reduction Increase of the risk of muscle damage and faintings. Reduction of reaction time, concentration and perceptive attention.					
4%	Muscle strenght reduction. Nauseas					
5%	Increase of the corporal temperature to 39° Fast performance reduction Rápida disminución del rendimiento. High risk of muscular damage.					
6%	Reduction and fail of termoregulatory system.					




INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS	
						
<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">Sawka et al., 2007; Palacios et al., 2008</div>						
% Weight loss	Effects					
1%	Cardiac work increase Aerobic performance reduction in warm climates					
2%	<b>Powerful thirst, physical discomfort, appetite reduction.</b> <b>Mental and cognitive performance reduction</b>					
3%	Blood volume reduction Increase of the risk of muscle damage and faintings. Reduction of reaction time, concentration and perceptive attention.					
4%	Muscle strenght reduction. Nauseas					
5%	Increase of the corporal temperature to 39° Fast performance reduction Rápida disminución del rendimiento. High risk of muscular damage.					
6%	Reduction and fail of termoregulatory system.					



INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Sawka et al., 2007; Palacios et al., 2008					
% Weight loss	Effects				
1%	Cardiac work increase Aerobic performance reduction in warm climates				
2%	Powerful thirst, physical discomfort, appetite reduction. Mental and cognitive performance reduction				
3%	Blood volume reduction Increase of the risk of muscle damage and faintings. Reduction of reaction time, concentration and perceptive attention.				
4%	Muscle strenght reduction. Nauseas				
5%	Increase of the corporal temperature to 39° Fast performance reduction Rápida disminución del rendimiento. High risk of muscular damage.				
6%	Reduction and fail of termoregulatory system.				




INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Sawka et al., 2007; Palacios et al., 2008					
% Weight loss	Effects				
1%	Cardiac work increase Aerobic performance reduction in warm climates				
2%	Powerful thirst, physical discomfort, appetite reduction. Mental and cognitive performance reduction				
3%	Blood volume reduction Increase of the risk of muscle damage and faintings. Reduction of reaction time, concentration and perceptive attention.				
4%	Muscle strenght reduction. Nauseas				
5%	Increase of the corporal temperature to 39° Fast performance reduction Rápida disminución del rendimiento. High risk of muscular damage.				
6%	Reduction and fail of termoregulatory system.				






INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Sawka et al., 2007; Palacios et al., 2008					
% Weight loss	Effects				
1%	Cardiac work increase Aerobic performance reduction in warm climates				
2%	Powerful thirst, physical discomfort, appetite reduction. Mental and cognitive performance reduction				
3%	Blood volume reduction Increase of the risk of muscle damage and faintings. Reduction of reaction time, concentration and perceptive attention.				
4%	Muscle strenght reduction. Nauseas				
5%	Increase of the corporal temperature to 39° Fast performance reduction Rápida disminución del rendimiento. High risk of muscular damage.				
6%	Reduction and fail of termoregulatory system.				



INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Sawka et al., 2007; Palacios et al., 2008					
% Weight loss	Effects				
1%	Cardiac work increase Aerobic performance reduction in warm climates				
2%	Powerful thirst, physical discomfort, appetite reduction. Mental and cognitive performance reduction				
3%	Blood volume reduction Increase of the risk of muscle damage and faintings. Reduction of reaction time, concentration and perceptive attention.				
4%	Muscle strenght reduction. Nauseas				
5%	Increase of the corporal temperature to 39° Fast performance reduction Rápida disminución del rendimiento. High risk of muscular damage.				
6%	Reduction and fail of termoregulatory system.				





INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS	
--------------	------------	------------	----------------------	------------------------	-------------	---

**Difficulties to set up an universal recommendation**


- Sweating rate
- Temperature and ambiental humidity
- Physical condition level
- **SPECIFIC POSITION (TEAM SPORTS)**

Casa et al., 2006; Sawka et al., 2007





Barbero et al., 2006  
Salum y Fiamoncini, 2006

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS	
--------------	------------	------------	----------------------	------------------------	-------------	---

**OBJECTIVES:**

- ✓ TO MEASURE **BODY WEIGHT LOSS** IN ELITE FUTSAL PLAYERS  
ACCORDING TO PLAYING POSITION
- ✓ TO DETERMINE AND TO COMPARE GAME TIME,  
DEHYDRATION LEVEL AND FLUID INTAKE **ACCORDING TO**  
**PLAYING POSITION**

INTRODUCTION	OBJECTIVES	<b>HYPOTHESIS</b>	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS	UNIVERSIDAD DE MURCIA
--------------	------------	-------------------	----------------------	------------------------	-------------	-----------------------

**HYPOTHESIS:**

- ✓ DEHYDRATION LEVEL **IN FIELD PLAYERS WILL BE HIGHER** THAN GOALKEEPERS
- ✓ INDEPENDENTLY OF PLAYING POSITION, FLUID INTAKE IN ELITE FUTSAL PLAYERS DURING REAL COMPETITION **WILL BE INSUFFICIENT** TO AVOID DEHYDRATION.

INTRODUCTION	OBJECTIVES	HYPOTHESIS	<b>MATERIAL AND METHODS</b>	RESULTS AND DISCUSSION	CONCLUSIONS	UNIVERSIDAD DE MURCIA
--------------	------------	------------	-----------------------------	------------------------	-------------	-----------------------


- Participants
- Tools
- Data collection protocol
- Data analysis

INTRODUCTION	OBJECTIVES	HYPOTHESIS	<b>MATERIAL AND METHODS</b>	RESULTS AND DISCUSSION	CONCLUSIONS	UNIVERSIDAD DE MURCIA
--------------	------------	------------	-------------------------------------	---------------------------	-------------	--------------------------

## Participants:

**12 players who played during 6 official matches  
(Spanish Futsal First Division):**

- 8 athletes played all the matches
- 4 athletes did not play all the matches
- Total 57 data:
  - 8 Goalkeepers
  - 49 Field players



INTRODUCTION	OBJECTIVES	HYPOTHESIS	<b>MATERIAL AND METHODS</b>	RESULTS AND DISCUSSION	CONCLUSIONS	UNIVERSIDAD DE MURCIA
--------------	------------	------------	-------------------------------------	---------------------------	-------------	--------------------------




## Tools:

- Calibrated test tube
- Scale TANITA BC-350



INTRODUCTION	OBJECTIVES	HYPOTHESIS	<b>MATERIAL AND METHODS</b>	RESULTS AND DISCUSSION	CONCLUSIONS	UNIVERSIDAD DE MURCIA
--------------	------------	------------	-----------------------------	------------------------	-------------	-----------------------





**Data collection protocol:**  
**To weight players before and after the game**



ISAK (1996)

INTRODUCTION	OBJECTIVES	HYPOTHESIS	<b>MATERIAL AND METHODS</b>	RESULTS AND DISCUSSION	CONCLUSIONS	UNIVERSIDAD DE MURCIA
--------------	------------	------------	-----------------------------	------------------------	-------------	-----------------------

**Data collection protocol:**  
**Fluid intake during the game**



**TOTAL FLUID ADDED– REMAINING FLUID = FLUID INTAKE**

INTRODUCTION

OBJECTIVES

HYPOTHESIS

MATERIAL  
AND  
METHODS

RESULTS AND  
DISCUSSION

CONCLUSIONS

UNIVERSIDAD DE  
MURCIA

## Data collection protocol:

### Time played per period

PLAYER	GAMEWEEK			27	FIRST PERIOD			
1	IN	20' 00"	IN	-	IN	-	IN	-
	OUT	00'00"	OUT	-	OUT	-	OUT	-
3	IN	20' 00"	IN	10'05"	IN	02'30"	IN	-
	OUT	17' 40"	OUT	05'40"	OUT	00'00"	OUT	-

WARM-UP (30') GAME TIME = TOTAL ACTIVITY TIME

INTRODUCTION

OBJECTIVES

HYPOTHESIS

MATERIAL AND METHODS

RESULTS AND DISCUSSION

CONCLUSIONS

UNIVERSIDAD DE MURCIA

Descriptive analysis

ACTIVITY TIME

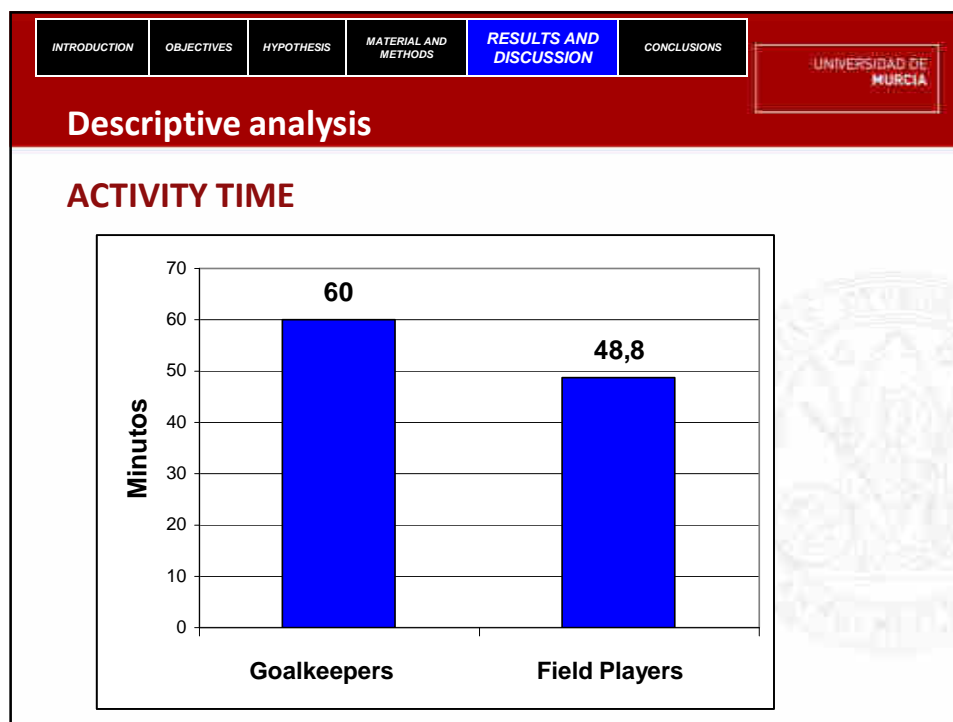
GAME	GOALKEEPERS	FIELD PLAYERS
Gameweek 19	50 (2)	50,2 (8)
Gameweek 21	70 (1)	47,5 (8)
Gameweek 23	70 (1)	47,7 (9)
Gameweek 25	70 (1)	49,9 (7)
Gameweek 27	70 (1)	47,7 (9)
Gameweek 29	50 (2)	50,2 (8)

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Descriptive analysis					
ACTIVITY TIME					
GAME	GOALKEEPERS	FIELD PLAYERS			
Gameweek 19	50 (2)	50,2 (8)			
Gameweek 21	70 (1)	47,5 (8)			
Gameweek 23	70 (1)	47,7 (9)			
Gameweek 25	70 (1)	49,9 (7)			
Gameweek 27	70 (1)	47,7 (9)			
Gameweek 29	50 (2)	50,2 (8)			

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Descriptive analysis					
ACTIVITY TIME					
GAME	GOALKEEPERS	FIELD PLAYERS			
Gameweek 19	50 (2)	50,2 (8)			
Gameweek 21	70 (1)	47,5 (8)			
Gameweek 23	70 (1)	47,7 (9)			
Gameweek 25	70 (1)	49,9 (7)			
Gameweek 27	70 (1)	47,7 (9)			
Gameweek 29	50 (2)	50,2 (8)			

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Descriptive analysis					
ACTIVITY TIME					
GAME	GOALKEEPERS	FIELD PLAYERS			
Gameweek 19	50 (2)	50,2 (8)			
Gameweek 21	70 (1)	47,5 (8)			
Gameweek 23	70 (1)	47,7 (9)			
Gameweek 25	70 (1)	49,9 (7)			
Gameweek 27	70 (1)	47,7 (9)			
Gameweek 29	50 (2)	50,2 (8)			

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Descriptive analysis					
ACTIVITY TIME					
GAME	GOALKEEPERS	FIELD PLAYERS			
Gameweek 19	50 (2)	50,2 (8)			
Gameweek 21	70 (1)	47,5 (8)			
Gameweek 23	70 (1)	47,7 (9)			
Gameweek 25	70 (1)	49,9 (7)			
Gameweek 27	70 (1)	47,7 (9)			
Gameweek 29	50 (2)	50,2 (8)			



INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
--------------	------------	------------	----------------------	------------------------	-------------

UNIVERSIDAD DE MURCIA

### Descriptive analysis

#### DEHYDRATION (% WEIGHT LOSS)

GAME	GOALKEEPER	FIELD PLAYER
Gameweek 19	1,03 (2)	1,04 (3)
Gameweek 21	1,39 (1)	0,79 (3)
Gameweek 23	1,62 (1)	0,87 (4)
Gameweek 25	2,19 (1)	0,77 (3)
Gameweek 27	1,60 (1)	0,82 (4)
Gameweek 29	0,82 (2)	1.07 (3)

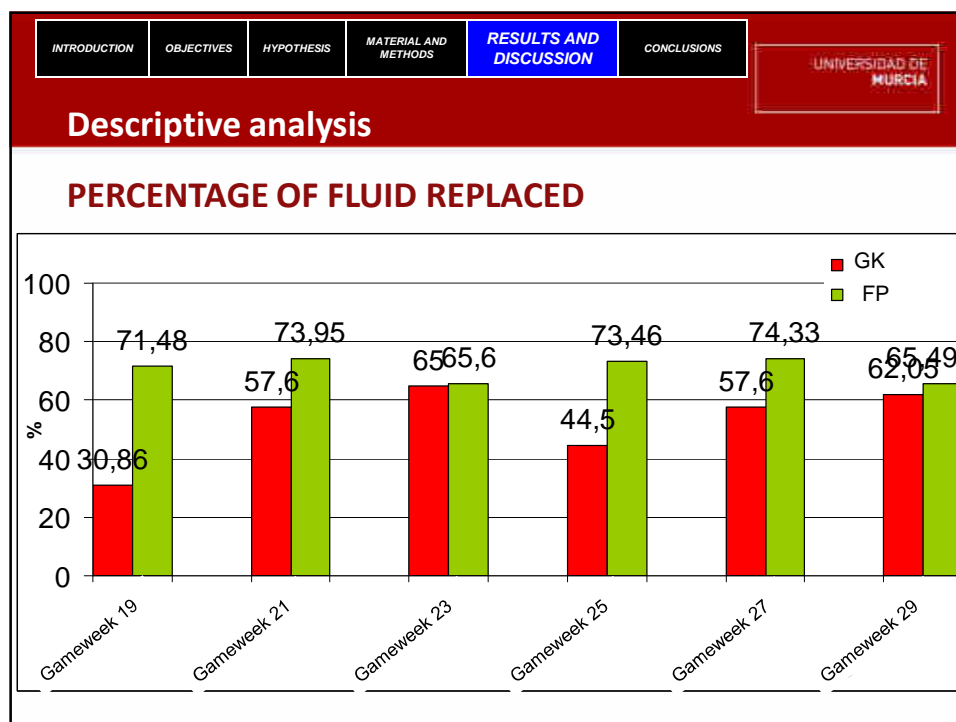
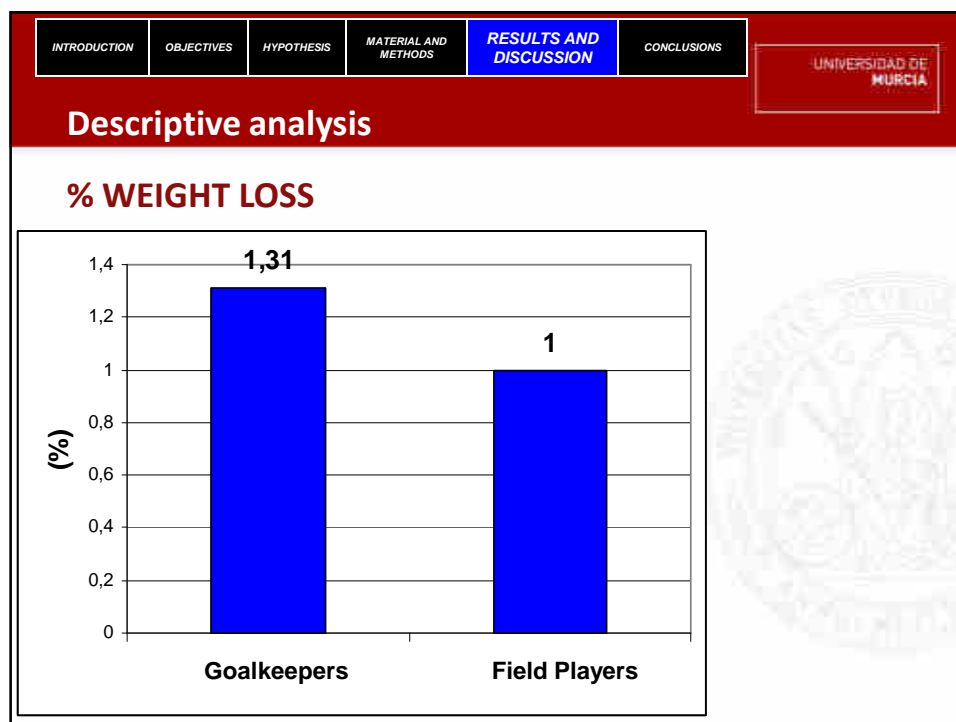


INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Descriptive analysis					
DEHYDRATION (% WEIGHT LOSS)					
GAME	GOALKEEPER	FIELD PLAYER			
Gameweek 19	1,03 (2)	1,01 (8)			
Gameweek 21	1,39 (1)	0,93 (8)			
Gameweek 23	1,62 (1)	1,05 (9)			
Gameweek 25	2,19 (1)	0,85 (7)			
Gameweek 27	1,60 (1)	0,92 (9)			
Gameweek 29	0,82 (2)	1,15 (8)			

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Descriptive analysis					
DEHYDRATION (% WEIGHT LOSS)					
GAME	GOALKEEPER	FIELD PLAYER			
Gameweek 19	1,03 (2)	1,01 (8)			
Gameweek 21	1,39 (1)	0,93 (8)			
Gameweek 23	1,62 (1)	1,05 (9)			
Gameweek 25	2,19 (1)	0,85 (7)			
Gameweek 27	1,60 (1)	0,92 (9)			
Gameweek 29	0,82 (2)	1,15 (8)			

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Descriptive analysis					
DEHYDRATION (% WEIGHT LOSS)					
GAME	GOALKEEPER	FIELD PLAYER			
Gameweek 19	1,03 (2)	1,01 (8)			
Gameweek 21	1,39 (1)	0,93 (8)			
Gameweek 23	1,62 (1)	1,05 (9)			
Gameweek 25	2,19 (1)	0,85 (7)			
Gameweek 27	1,60 (1)	0,92 (9)			
Gameweek 29	0,82 (2)	1,15 (8)			

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
Descriptive analysis					
DEHYDRATION (% WEIGHT LOSS)					
GAME	GOALKEEPER	FIELD PLAYER			
Gameweek 19	1,03 (2)	1,01 (8)			
Gameweek 21	1,39 (1)	0,93 (8)			
Gameweek 23	1,62 (1)	1,05 (9)			
Gameweek 25	2,19 (1)	0,85 (7)			
Gameweek 27	1,60 (1)	0,92 (9)			
Gameweek 29	0,82 (2)	1,15 (8)			

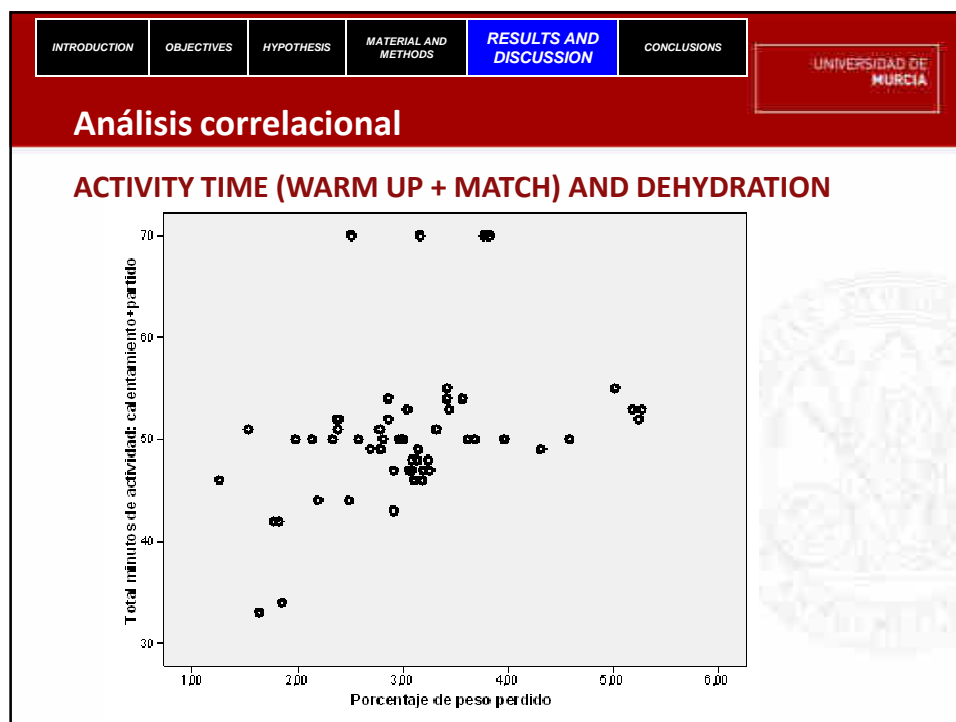


INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
<b>Contrast analysis</b>					
<b>DEHYDRATION DIFFERENCES ACCORDING TO SPECIFIC POSITION</b>					
<b>GAME</b>		<b>Kruskal-Wallis Test (p)</b>			
Gameweek 19		0,580			
Gameweek 21		0,041			
Gameweek 23		0,326			
Gameweek 25		0,082			
Gameweek 27		0,214			
Gameweek 29		0,268			

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
<b>Contrast analysis</b>					
<b>DEHYDRATION DIFFERENCES ACCORDING TO SPECIFIC POSITION</b>					
<b>GAME</b>		<b>Kruskal-Wallis Test (p)</b>			
Gameweek 19		0,580			
Gameweek 21		0,041			
Gameweek 23		0,326			
Gameweek 25		0,082			
Gameweek 27		0,214			
Gameweek 29		0,268			

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
<b>Correlational analysis</b>					
<b>ACTIVITY TIME (WARM UP + MATCH) AND DEHYDRATION</b>					
GAME	Sig.	Spearman's Rho	N		
Gameweek 19	0,038	0,661	10		
Gameweek 21	0,728	0,136	9		
Gameweek 23	0,121	0,523	10		
Gameweek 25	0,453	0,311	8		
Gameweek 27	0,077	0,584	10		
Gameweek 29	0,044	0,646	10		

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
UNIVERSIDAD DE MURCIA					
<b>Correlational analysis</b>					
<b>ACTIVITY TIME (WARM UP + MATCH) AND DEHYDRATION</b>					
Game	Sig.	Spearman's Rho	N		
Gameweek 19	0,038	0,661	10		
Gameweek 21	0,728	0,136	9		
Gameweek 23	0,121	0,523	10		
Gameweek 25	0,453	0,311	8		
Gameweek 27	0,077	0,584	10		
Gameweek 29	0,044	0,646	10		



INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS
--------------	------------	------------	----------------------	------------------------	-------------

UNIVERSIDAD DE MURCIA

### FIRST

Mean weight loss is **higher in goalkeepers** versus fieldplayers, while this differences are not significant.

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS	UNIVERSIDAD DE MURCIA
--------------	------------	------------	----------------------	------------------------	-------------	-----------------------

**SECOND:**

Independently of playing position, fluid intake in **was enough** to avoid dehydration.

INTRODUCTION	OBJECTIVES	HYPOTHESIS	MATERIAL AND METHODS	RESULTS AND DISCUSSION	CONCLUSIONS	UNIVERSIDAD DE MURCIA
--------------	------------	------------	----------------------	------------------------	-------------	-----------------------

**THIRD:**

There is a **positive relation** between activity time and body weight loss because of dehydration in elite futsal players.

III. DEHYDRATION IN ELITE FUTSAL PLAYERS

UNIVERSIDAD DE MURCIA

3. RECOMMENDATIONS

**To apply hydration test to futsal players**

**To personalise hydration strategies**

**To make easy hydration possibilities to goalkeepers**


THE ROLE OF EXERCISE AND SPORT SCIENCES IN SPAIN: THE  
CONSEQUENCES ON EDUCATION (P.E.) AND SPORT (FUTSAL)  
ACHIEVEMENT

**Terima kasih atas perhatiannya**

Dr. D. José Vicente García Jiménez

University of Murcia - Spain

jvgjimenez@um.es

 @CheviProfe

+ 34 868 88 7086



## **The Physical Education and Sport Implementation in Nation and Character Building, Cases in Thailand**

Dr. Achara Soachalerm

Faculty of Education, Kasetsart University

Bangkok, Thailand

### **Abstract**

According to the education reform of the second decade (2009-2018), the main focus of this reform is to ensure the quality and standard of education and learning in Thailand. This focal point increases an opportunity in educating and learning. One of important factors of the reform is to ensure the development applies to all levels of physical education. And it has a huge impact that transform Thai education.

The National Education Act B.E.1999 and the Amendments (2<sup>nd</sup> National Education Act B.E.2002), this Act have developed curriculum that changed from Teacher-centered design to Learner-centered design. With this Act, it also changed physical education from a nationwide basis to local administration organizations, which also referred as a local wisdom. This new development is correlated with Thailand's Eleventh National Economic and Social Development Plan (2007-2011) stated that in order to fully develop children in 21<sup>st</sup> century, education must emphasize on improving their moral standard, sense of pride to be Thai, critical thinking skill, creativity, and technological knowledge. And it must encourage children to improve their social skill and be able to work with others peacefully. This plan also supports the sport strategies under the motto "Sport Build People, People Build Nation."

On November 28, 1961, the opening day of the annual student athletes competition, his Majesty King Bhumibol Adulyadej (Rama IX) gave a royal guidance to the student athletes stated that *"...Sport is counted as a very important educational tool. That's because it helps improve a child's mental toughness, bravery, sportsmanship, and promote physical wellness. It's a contributing factor to a child's high performance on both: mentally and physically. Consequently, a child will grow be a good citizen of the nation, which is an ultimate aspiration..."* Because of his Majesty's speech, the Ministry of Tourism and Sports proclaimed the National Development Plan No. 5 (2012 - 2016). This strategy established sports as a critical part of Thailand development. It focused on supporting Thai populations to exercise and play sports the right way until it became their habits. It promoted better health, better performance, moral standard, kindness, and sportsmanship. The government encouraged everyone in Thailand to be a part of it. The main objective was to harmonize and reconcile Thai populations together as one. This new policy had the same framework as the Eleventh National Economic and Social Development Plan (2012-2016) that currently operated in Thailand. It set priority for people to be the focal point of this profound development, which was also known as People-centered development. The plan provided equal opportunities to all provinces, and it entirely respected people's decisions. The key concept was to transport the country to the equilibrium in every dimension. From the first plan until the current one, the Ministry of Education has continued to set their objectives to develop intellectual, emotional, and psychomotor domains of all Thai populations. And under this plan, the terms of physical education and sports, it was critical that the curriculum applies to all education levels. It encouraged students and educators to participate in physical activity. For the fundamental level, students took part in physical education and play sports twice a week. At a higher level, the program offered two physical activity or sports per year. Students also had an option to join in another physical activity or sport outside the school courses. Most of outside-of-school activities had the same meaning as physical education and sports, which were presented to students everywhere in the world.

### **What is so unique about Thai sports?**

Sports in Thailand are more than just physical exercises or trainings. They combine with Thai traditional culture, which in turn give a unique character building to the participants. Starting from the young age, children would be learning about respect, moral values, kindness, politeness, and a sense of pride to be Thai along with physical education. They would be taught to show respect and Wai their opponents before and after competing. In additional, there're a couple of Thai sports, which will be mentioned in details later, that participants must perform Wai Khru dance before they compete. The Thai traditional Wai Khru allows participants to pay respect and express their gratitude to their teachers and ancestors. The Thai style is known to be "Tough but not rough, meek but not weak."

Another significant factor in character building is meditation. Most Thai people are trained to meditate when they were young. Many of them have practiced meditation until it became their second nature. Therefore, meditation has played an important role in physical activity and sports. Generally, before any sport competition, the participants would close their eyes and concentrate on their breathings. They would spend at least a few minutes to focus their minds at the tip of their noses while they're inhaling and exhaling. This process helps calm their nerves down; it allows them to relax their minds and bring awareness back to the present moment.

In fact, many researches have shown that meditation has great benefits to the body and mind. For sports, meditation can help in the following areas:

1. Improve precision in action
2. Enhance concentration

3. Release tension
4. Increase endurance/stamina
5. Gain self-confident
6. Boost performance
7. Develop better interpersonal relationships
8. Explore untapped energy

When mention about sports in Thailand, most people would immediately think of Muay Thai and krabi-krabong. These 2 distinctive sports were born, raised, and have been with Thai Kingdom since the beginning of Thai history.

### **What is Muay Thai?**

In the Middle Ages or Ayutthaya Kingdom, Muay Thai (Thai kickboxing) was started and used in a close range hand-to-hand combat. This sport was a crucial skill for all Thai soldiers to learn to protect themselves and to attack their enemies. It was included in military training and made famous by King Naresuan the Great (1555-1605). Around 1774, Ayutthaya was invaded by Burmese troops. At that time, thousands of Thais were captured and took back to Burma as prisoners. The Burmese King Mangra (well-known among Burmese as “King Hsinbyushin”) decided to organize a boxing match between Muay Boran (direct ancestor of Muay Thai) and Burmese boxing (Lethwei). In that event, Nai Khanomtom was selected to represent Muay Thai to fight against a Burmese champion. Nai Khanomtom performed Wai Khru dance around his opponent. Burmese spectators were mesmerized and mystified by his pre-fight dance. Many of them thought Nai Khanomtom was performing a witchcraft or black magic. When the fight started, he rapidly charged the Burmese champ with punches, elbows, knees, and kicks until his opponent collapsed on the ground. The Burmese referee declared the knock out was invalid because of Nai Khanomtom’s dance distracted the Burmese champ’s concentration. Then, King Mangra ordered Nai Khanomtom to fight nine more fighters to prove that the knock out was purely from Nai Khanomtom’s skill, not from any black magic. Nai Khanomtom fought fighter after fighter until the 10th fighter without any rest in between. His last opponent was a highly respected Burmese kickboxing teacher. But even the great teacher, he could not withstand Nai Khanomtom’s superb Muay Thai skill. Nai Khanomtom crushed him down to the ground like the rest of the Burmese fighters. King Mangra was so much impressed and granted Nai Khanomtom a freedom.

Nowadays, Muay Thai has spread around the world, and every mixed martial art uses Muay Thai as one of their weapons. And Nai Khanomtom has been recognized by those fighters/warriors as the “Father of Muay Thai.”

### **What is krabi-krabong...and why is it so significant to Thai history?**

Krabi-krabong (single-edge sword and staff) fighting was developed by ancient Siamese warriors for fighting in a weapon-based close range on the battlefield. In ancient time, krabi-krabong was a King’s sport. This fighting technique was a part of the 18-courses of King’s education. Thai history did not precisely record it, but presumably krabi-krabong might have been practiced in conjunction with Muay Boran. In the 16<sup>th</sup> century, Ayutthaya era, King Naresuan started to learn krabi (single-edge sword) fighting style when he was 16 years old. Many years later, he became an expert in krabi fighting style. When Burmese tried to invade Thai Kingdom, King Naresuan and his forces using krabi as their main weapons fought back the Burmese army. Burmese kept trying numerous times, but every single time King Naresuan and his forces would successfully repel them. In the final attempt, Burmese sent in around 25,000

soldiers to outnumber King Naresuan's forces. King Naresuan had no other options but to risk his own life and charge his elephant through Burmese soldiers. He went up to the Burmese Crown Prince, who was the commander of Burmese army, and challenged him to the one-on-one elephant-combat battle. With his highly skilled in krabi, King Naresuan used his halberd (ngao) slashed and put the Crown Prince to rest. Subsequently, Thai Kingdom stayed freed from Burmese whilst King Naresuan was on the throne.

Krabi-krabong has 7 benefits as described below:

1. Can be used to defend and protect oneself in times of danger
2. Aid in moral principles and ethics building, such as have a courage to do the right things, be patient with others, respect others, and believe in oneself
3. Develop a sense of pride to be the owner of a distinctive sport that protected and kept Thailand free from enemies and invaders
4. Conserve the traditions of Thai culture
5. Improve an individual manners
6. Nourish spiritual values
7. Enhance body strength

### **What is girls/women's role in sports?**

In the 16<sup>th</sup> century, Ayutthaya period, women were forbidden from getting education and disallowed to participate in physical activity or sports. That also included skills in the art of krabi, fighting on a horse or elephant's back. If women wanted to learn any of those skills or engage physical activity, they have to do it secretly. This barrier prevented women from helping men protect the country in time of war. However, during the reign of King Maha Chakkraphat (around 1548), Queen Sri Suriyothai disagreed with the laws and quietly practiced the art of krabi until she became very skillful in krabi fighting style. At that time, the King of Burma, Tabinshwehti, tried to invade Ayutthaya, which was the capital city of Thailand back then. Queen Suriyothai decisively joined the force by disguised herself as a Crown Prince and gained a permission to convoy the King into the elephant-combat battle. In the middle of the encounter, the King found himself outmaneuvered and was in grave danger. With an enormous fear for the King's life, Queen Suriyothai charged her elephant forward and placed herself in between the King and Viceroy, the Prince of Prome. The Queen's action stopped the commander of Burmese army from pursuing King Chakkraphat and started to engage her. After battling for awhile, Queen's elephant was dominated by Viceroy's elephant. Viceroy took advantage of this unfortunate opportunity and cleaved the Queen's left shoulder with his halberd. Queen Suriyothai collapsed and died on the back of her royal elephant.

Queen Sri Suriyothai sacrificed her life to rescue her husband. Because of her heroic act, it gained enough support to fight back the Burmese invaders and saved Ayutthaya. The Queen was among thousands of women who risked their lives to protect the beloved country from invaders. To name a few, Thao Suranaree of Nokornrachasima Province, Thao Tepsatree, and Thao Srisunthorn of Puket Province also saved the country in Rattanakosin Period (18<sup>th</sup> century).

### **What has been changed since then?**

It has been an attempt to make physical education and sports to boys and girls on an equal basis. However, girls and women still experienced the lack of opportunity to participate in all the boys' or men's physical activities. Most parents still kept their daughters inside the house for doing chores and housekeeping tasks. Girls were encouraged to keep their bodies in

good shapes as an ideal female in front of a fashion magazine cover. They were trained to look young, thin, sexy, and pretty. This old way of thinking could be summed up to three words: femininity, marriage, and family. Girls couldn't take part in some sports such as sepak takraw (kick volleyball), football, Muay Thai, krabi-krabong, and all of men's combative sports. Since most physical activities and sports were created by men, it's been male-oriented sports. There were some old beliefs saying that sports were too dangerous for girls. If girls or women participated in sports, it would cause them to look old and unattractive to men. Because of the wrong ideas, female was discouraged to be involved in physical activity or sports. In school, girls were forced to learn needlework while boys were inspired to engage in sports. As for physical education teachers or professional sport coaches, women's opportunity to grow was limited when compared to men's. The fact of the matter is the proportion between girls' and boys' acceptance as physical education students in colleges or universities was around 1:3 or as small as 2:5. In the market place, the percentage of women got hired for a job still continued to be lesser than men.

On August 19, 1999, the National Education Act B.E. 1999 was put into effect throughout Thailand. This Act contained unequivocal equal rights provisions to all students and educators in every school. This legislation caused great changes in women's physical education, participation physical activity, and sports. It's been projected that the numbers of women's participations would increase drastically in the near future by virtue of this Act. It's been a difficult and long journey for Thai girls and women, but finally the barriers which segregated genders were torn down. The road that lead to a better society where women and men are equally treated is now paved the way to a brighter future for physical education and sports.

## Reality Check

There're 5 main departments of physical education and sports in Thailand:

1. Ministry of Education,
2. Sports Authority of Thailand
3. Ministry of Interior
4. Bangkok Metropolitan Administration (which mainly based in Bangkok)
5. Olympic of Thailand

For some reason, sports in Thailand still not grow as the way they're supposed to. One of the contributed factors causes by the ignorance of sports authority. Many of them wouldn't comply with the current policies. Additionally, government and private sector still not fully support physical education and sports. The lack of support means not enough equipment for all the schools, and it means not enough money to hire decent physical education teachers or coaches. The government policies regarding to physical education and sports are not attractive enough. Moreover, the talented athletes in Thailand do not earn enough income to support themselves and families, so they're unenthusiastic to take on sports as their professions. When comparing between Thai athletes and the rest of the world, the earning of Thai athletes are discovered to be lower. Thus, government and private sector need to get their acts together and come up with a real-world solution; the one that can actually be fulfilled and taken it into actions, rather than just a mere policy.

## What else?

When speaking of a character building of Thai populations in the 21<sup>st</sup> century, there're a couple of practical concepts came to mind. These conceptions may or may not directly generate by physical education or sports. Nevertheless, they are directly involved with teachers',

instructors', and professors' expectations. These concepts should be a part of 21<sup>st</sup> curriculum development skills for all students and educators.

The first concept is called 5C skills:

1. Connectivity ability skills
2. Critical thinking skills
3. Creative problem solving skills
4. Collaborative life skills
5. Computing skills

The second concept is the students' characteristic goals:

1. Have disciplinary (obey the rules and regulations)
2. Have respect (treat others as the way they deserve to be treated )
3. Have moral principles (no right from wrong)
4. Have an attribute attitude (sense of social responsibility)

### **At the End**

Thai traditional sports: Muay Thai and krabi-krabong have been the key factor for Thailand freedom. Thai ancestors worked extremely hard to create and develop these unique arts of fighting. These fighting styles helped chase away all Thai invaders and saved the country countless of times in the past centuries. Thai children were taught more than just physical exercises. They were disciplined to respect others, to have moral principles, to be tough mentally and physically, and to love their beloved country as much as they love themselves.

## Reference:

1. Office of the Prime Minister. **Thailand's Eleventh National Economic and Social Development Plan (2012-2016)**. Bangkok: Sahamitttrprinting and Publishing Co.
2. Ministry of Tourism and Sports of Thailand. 2002. **National Development Plan No. 5 (2555 – 2559)**. Bangkok: New Thai Mitrapapprinting Co.
3. Office of the National Education Commission. **The National Education Act B.E. 1999 and Amendments (Second National Education Act B.E. 2545 (2002))** Bangkok: Pimdeekarnpim.
4. Muay Thai. [http://en.wikipedia.org/wiki/Muay\\_Thai](http://en.wikipedia.org/wiki/Muay_Thai)
5. Krabi-krabong. <http://en.wikipedia.org/wiki/Krabi-krabong>
6. Mind + Sport institute. <http://www.mindandsport.org/portfolio/meditation-2/>
7. Athlete Meditation Research. [http://www.project-meditation.org/a\\_bom1/athlete\\_meditation\\_research.html](http://www.project-meditation.org/a_bom1/athlete_meditation_research.html)
8. Sri Suriyothai. [http://en.wikipedia.org/wiki/Sri\\_Suriyothai](http://en.wikipedia.org/wiki/Sri_Suriyothai)

# Achieving Excellence in Badminton: Shifting from Indigenous Culture to Application of Sport Science and Management Culture

Dr. Lim Peng Han

[penghan12@gmail.com](mailto:penghan12@gmail.com)

## Abstract

This paper attempts to find out what are the cultural factors that contributes towards the success of men badminton players to win the Thomas Cup or Olympic gold medals since the first Thomas Cup competition that was held in 1948 and when badminton was included in the Olympic Games in 1992 respectively. Since 1948 only three countries have won the Thomas Cup, Malaysia, Indonesia and China. From 1992 to 2012 ninety per cent of Olympic medals for badminton were won by Asian players. Thus this research tries to find out what were the Asian and also Western cultural factors that contributed to badminton excellence during the four distinct periods of competitive growth. During the first period from 1893 to 1941 when 17 Badminton Associations were established, what are the cultural factors that contributed towards achieving badminton excellence in the clubs, associations and schools in Malaya? During the second period from 1948 to 1980 when only Malaysia and Indonesia won the Thomas Cup what are the cultural factors that contributed towards their success? During the years 1981 to 1992 when China was admitted into the IBF and subsequently won four out of six Thomas Cup finals, what are the cultural factors that contributed towards this success? During the years 1994 to 2012 what are the cultural factors that contributed towards China and Indonesia each winning five of the Thomas Cup finals and Indonesian and Chinese players winning 58 per cent of all Olympic medal for the men's singles and doubles events?

*Keywords: badminton, culture, sports science, sports management, Thomas Cup.*

## INTRODUCTION

The game of badminton has grown to be a global sport if we were to consider the following factors: The country membership of the Badminton World Federation (BWF) has grown from an initial 9 in 1934 to 61 in 1978 (International Badminton Federation 1988, 23-24). By 2009 it expanded to 166 full members, representing all the populous parts of the world (Berg 2009, 105). However, the growth centres mainly in Asia where the game is the most popular racket game in Indonesia, China and India. In a survey on the status of sports participation throughout China conducted by the General Administration of Sports of China in 2004 showed that badminton had the largest participation with the number of fans reaching 250 million (Anon 2009, 1).

In 1996 there were 59 sanctioned tournaments (Ward 1996a, 2; Ward 1996b, 2). By 2012 there were 102 sanctioned tournaments. There were 12 Superseries tournaments, all sponsored by Asian companies, offering the highest total prize money of US\$200,000 to US\$ 350,000. Nine of the 12 Superseries tournaments were held in Asia (Badminton World Federation 2012).

Asian companies and brands are interested to sponsor badminton tournaments because of the television coverage of key territory in Asia and potential of achieving high ratings. The key territories are the People's Republic of China, Hong Kong, Macau, India, Indonesia, Malaysia, Singapore, Japan, South Korea, Thailand, Vietnam and the Philippines (Badminton World Federation 2010). The 1992 Thomas Cup finals held in Kuala Lumpur was "the highest rated programme in the history of Malaysian television (not just sports television, but all television)" (McCormack 1993, 6).

Moreover, Asian badminton team and players have consistently excel in world badminton competitions. Since 1948 until 2012, only three Asian countries have won the Thomas Cup. They were Malaysia, Indonesia and Chinese. From 1966 to 2012 only four Asian countries have won the Uber Cup. They are Japan, Indonesia, China and Korea. From the years 1992 to 2012 90 per cent of the Olympic medals were won by Asian players (Lim 2013, 67). Therefore achieving excellence in men's



badminton should be study historically from an Asian cultural perspective although there are Western cultural contributions and influence as well. The focus of this paper is to study the men's players and teams because the study of women's players and teams have different stages of development and badminton excellence as well as cultural differences relating the female gender.

Earlier research by Lim (2013) suggests that there are four stages of badminton development from a global and achievement perspective. The first phase of development began with the founding of 17 badminton associations in Europe, Asia, Americas, Australasia and Africa from 1893 to 1941. It tries to record the origins and development of badminton into British Malaya. It was later adopted by the local Chinese, Malay, Eurasian and Indian communities. Physical Education (PE) and badminton was also introduced into the schools in 1924 and 1930 respectively.

During the second stage of development from the years 1948 to 1980 it tries to find out what were the cultural factors that contributed to Malaysia winning the Thomas Cup four times (1949, 1952, 1955 and 1967) and Indonesia, 7 times (1958, 1961, 1964, 1967, 1970, 1973 and 1976)? After China was admitted to the International Badminton Federation (IBF) in 1981, its men's team won the Thomas Cup four out of five times from 1981 to 1990. What were the likely cultural factors that contributed towards these successes during the third phase of development? From the years 1992 to 2012 Indonesia (1994, 1996, 1998, 2000 and 2002) and China (2004, 2006, 2008, 2010 and 2012) each won the Thomas Cup five times. Furthermore, Indonesia and China won 50 per cent or 22 Olympic medals for badminton from 1992 to 2012. What were the cultural factors which contributed to Indonesia's and China's successes? Throughout these periods of study attempts will also be made to assess the introduction and relevance of sports science and management culture in achieving excellence in men's Thomas Cup winner and Olympic medallists for badminton. This research uses Tylor's definition of culture as a "complex whole which includes knowledge, belief, art, morals, law custom, and any other capabilities and habits acquired by man as a member of society" (Ogburn 1937, 161).

### **FIRST PHASE OF DEVELOPMENT, 1893-1941**

Modern badminton was likely to have originated in India and created by the British during the colonial period towards the end of the nineteenth century. The game was played in various parts of India such as Madras, Bombay, Peshawar, Calcutta and Poona, at that time an important military base (Guillain 2004, 47-48). The Army officers brought the game back to England after they retired at English spas (Scheele 1954, 1-5).

The earliest record of badminton being played in Singapore was in 1874 when it was reported that croquet and badminton were played "among the upper two hundred" (Correspondent 1874, 6). It was also played by soldiers of the H.M. 10<sup>th</sup> Regiment at Tanglin Barracks in 1876. It was mentioned that the soldier participated in the social life of the colony by playing cricket, badminton, croquet and going to the "Race Course" (Anon 1876, 3). There were also newspaper advertisements selling badminton "bats, shuttlecocks, nets and poles" in the *Straits Times* (Anon 1899, 4), *Straits Observer* (Anon 1897, 6) and the *Singapore Free Press and Mercantile Advertiser* (Anon 1898, 2). There are many studies to show the diffusion and transmission of sports as a process of colonization. Since the eighteenth century whenever British businesses went, its civil servants, soldiers, builders, teachers and missionaries were sure to precede or follow. Collectively they introduced British culture like sports and games, on native subjects. The British refined the concept of sport as organised competition where there are winners and losers. They also created uniform sets of rules to govern play in the sports (Crego 2003, 43-44).

The Amateur Sporting Association, founded in 1920 (Anon 1921, 12), was the first association to introduce the game of badminton in Singapore as well as the whole of Malaya (Anon 1934a, 13). Since the mid-1920s several clubs, including many calling themselves "Badminton Party" were established in Singapore. They were Chinese Friendly Association, Everton Road Badminton Party (Anon 1924, 12), Diehard Badminton Party, Austin Badminton Party, Bengkalis United, Chin Woo Badminton Party, Gleeful Badminton Party, Hercules Badminton Party, Malayane Association,

Mayflower Badminton Party, Rovers Badminton Party, Roseray Badminton Party, Thompson Badminton Party, United Chinese Badminton Party (Anon 1928a, 12), Evergreen Badminton Party (Anon 1929a, 9), Cold Storage AC, Siew Sin Sia Badminton Party (Anon 1928b, 20), Other known parties were Seet Kim Cheng's Badminton Party (Anon 1929b, 7), Lourdes Badminton Party (Anon 1929c, 16), Horlicks Badminton Party (1929d), Serangoon Choir Badminton Party (Anon 1929e, 16), Kampong Jagoh Muslim Badminton Party (Anon 1929f, 10) and Indian Association (Anon 1929g, 12).

The local badminton parties were formed along ethnic lines. Diehard members were mostly Eurasians, Lourdes Badminton Party consisted of Indians, including the Malayane Association and Indian Association. Most of the parties were established by the Chinese while Kampong Jagoh Muslim Badminton Party was formed by the Malay Muslim community.

The Singapore Badminton Association (SBA) was founded in 1929 (Anon 1931, 20). There were 17 clubs affiliated with the Association, "the greatest number to be affiliated with any badminton association in Malaya. It was also the only association in Malaya to be affiliated with the Badminton Association of England (BAE) (Anon 1934b, 19). In Selangor the first local team Sunlight Rover Badminton Team was formed in 1923 at 2, Batu Lane, Kuala Lumpur. There were also five other teams. The Selangor Badminton Association was formed in 1930 to organise the game at state level (Anon 1933, 15). In November 1934 delegates from the Perak, Selangor, Singapore and Penang met at the Perak Turf Club to form the Malayan Badminton Association (MBA) (Anon 1934c, 14). J. L. Woods, President of the Perak Badminton Association, was unanimously elected first president of the MBA (Anon 1934d, 16). The first Malayan Badminton Association championships were held in 1937 at the Happy World covered stadium in Singapore.

The introduction of badminton in schools

The YMCA was established in Singapore in 1903. It organised education programmes, talks and lectures aimed at helping the young in choosing their careers (Flower 2002, 6). J. W. Jefferson arrived in Singapore in 1920 to be the Physical Director of the Y.M.C.A. He received his training in England and was a graduate of Springfield College where he obtained his Bachelor of Physical Education (B.P.E.) (Cranna 1921, 11).

In 1924 the Straits Settlements Government appointed Jefferson as superintendent of physical education to develop work that had begun by the Y.M.C.A. (Jefferson 1948: 50). He introduced a general scheme of physical training for both school children and teachers (Anon 1922, 8). In 1928 his work was extended to the Federated Malay States, and an assistant superintendent was appointed. In 1930 a woman supervisor of physical education was appointed to deal with the work in the primary and girls' schools. Asiatic assistants (Malays) have also been appointed as supervisors in the vernacular schools in Singapore, Malacca and Selangor (Jefferson 1948, 50). In 1930 the Education Department provided facilities for "indoor games like badminton" (Winstedt 1931, 40). Five years later, Inter-School badminton championships was organised for the first time in Singapore on inter-club lines (three singles and two doubles) (Badminton Correspondent 1935, 18).

Badminton was introduced in China during the 1920s and was played in Canton, Foochow and other cities in the south (People's Publishing House 1974, 1). Brown (2006, 73) suspects that badminton was introduced to Indonesia from the Malay Peninsula and, to a lesser extent, Singapore via the long-standing commercial and social ties linking Chinese communities on both sides of the Straits of Malacca. Evidence available so far is that in its early days the game was dominated by ethnic Chinese players, nor Dutch or indigenous Indonesian, origin.

The development of badminton into a globalised game can be seen in four phases or distinct periods. In the first phase the institutionalization of modern organised badminton began with the founding of 17 badminton associations from 1893 to 1939. The Badminton Association of England (BAE) was established in 1893 with 14 clubs as original members. The Guildford court of 44 ft. by 20 ft. was

adopted (Scheele 1954, 2-5). It is likely that the British contributed to the spread of badminton to the Asia countries, New Zealand and South Africa listed in Table 1 as these were then crown colonies.

**Table 1:** Formation of 17 Badminton Associations from 1893 to 1941

Year	Europe (9 countries) <sup>1</sup>	Year	Asia (3 countries)
1893	Badminton Association of England	1925	Penang Badminton Association <sup>2</sup>
1899	Badminton Association of Ireland	1929	Singapore Badminton Association <sup>3</sup>
1908	French Badminton Association	1934	Selangor Badminton Association <sup>a</sup>
1922	Scottish Badminton Association	1934 (1)	Kedah Badminton Association <sup>o</sup>
1927	Welsh Badminton Association	1934 (2)	Malayan Badminton Association (consisted of Penang, Singapore, Perak, and Selangor). <sup>o</sup>
1930	Danish Badminton Association	1934 (3)	Hong Kong Badminton Association <sup>1</sup>
1931	Netherlands Badminton Federation		Indian Badminton Association <sup>1</sup>
1931	Sweden Badminton Association		
1931	Norwegian Badminton Federation	1927	<b>Australasia (1 country) <sup>1</sup></b>
	<b>Americas (3 countries) <sup>1</sup></b>		New Zealand
1921	Canadian Badminton Association		<b>Africa (1 country) <sup>1</sup></b>
1936	United States Badminton Association	1938	South Africa
1939	Mexico Badminton Association	<b>Total</b>	<b>17 countries</b>

Sources: <sup>1</sup> Ganner 1985; <sup>2</sup> Guillain 2004; <sup>3</sup> Editor 1931, 13; <sup>o</sup> Editor 1934, 16.

## **SECOND PHASE OF DEVELOPMENT, 1946-1981**

After the Second World War the British created the Malayan Union and Singapore became a Colony separated from the settlements of Penang and Malacca (McKerron 1947, 7-8). The contest for the badminton men's team event began after the Second World War when 10 countries compete for the inaugural Thomas Cup. Malay won the Cup consecutively in 1948, 1952 and 1956 (International Badminton Federation 2000, 169). From the years 1950 to 1956 Malayan players won the All England men's singles event – Wong Peng Soon won on four occasions and Eddy Choong three times (Ong 1984, 1).

### ***Founding of the Japanese Badminton Association and Badminton Association of Indonesia***

The Nippon Badminton Association (NBA) was founded in 1946. The Association was affiliated to the IBF in 1951 (Ganner 1985, 264). The Persatuan Bulutangkis Seluruh Indonesia (PBSI) or Indonesian Badminton Association was founded in 1951 (Ganner 1985, 241). In 1958 newcomer Indonesia won the Thomas Cup to the newly independent Malaya. Indonesia successfully defended the Cup in 1961 and 1964 (International Badminton Federation 2000, 169).

In 1964 the MBA was replaced by the Badminton Association of Malaysia (BAM) to be represented by all 14 states in Malaysia (Siebel 1964, 19). Singapore left the Federation of Malaysia in 1965 (Woodrow 1985, 53). Malaysia won the Thomas Cup in 1967. However, Indonesia regained the trophy consecutively four times from 1970 to 1979 (International Badminton Federation 2000, 169). Indonesian Rudy Hartono won the All England men's singles title from 1968 to 1974. The men's doubles pairs won the men's doubles titles from 1968 to 1981, except for 1976 (Badminton Association of England 1993, 48). By the mid 1980s the Indonesian Badminton Association had 225 branches representing two million players throughout the archipelago (Ganner 198, 241).

### ***The Uber Cup tournament, 1956-1981***

The ladies' biannual world team badminton championships began in 1956 with 11 countries competing for the Uber Cup. The United States won the Cup consecutively in 1957, 1960 and 1963. Japan won the fourth to sixth tournaments in 1966, 1969 and 1972. Indonesia won the Uber Cup for the first time in 1975. When Japan took back the Cup again in 1978 and 1981 only a total of 16 and 15 countries respectively competed (International Badminton Federation 2000, 172).

### **THIRD PHASE OF DEVELOPMENT, 1981-1991**

#### ***China's membership into the International Badminton Federation***

In 1949 the Communists won the civil war and controlled all China except the Taiwan. They established the All-China Sports Federation 1952 to be the governing body in charge of all sporting affairs in China. After looking at the system of the Soviet Union, the Ministry of Sport, directly supervised by the State Council, was founded in 1952, to replace the All-China Sports Federation (Hong 2010, 407). The Chinese Badminton Association (CBA) was established in 1954 (Ganner 1985, 79). In the same year several overseas Chinese coaches from Indonesia returned to China and promoted the game in terms of tactics and training techniques. When China's Cultural Revolution (1966-1976) began, badminton teams were disbanded in each city and province. It was not until 1971 that the national team was reorganised by the central government (Hong, Mackay and Christensen 2008, 33). In 1975 360 players were selected from 24 provinces to compete in the national tournament (China Badminton Association 1978, 62).

The World Badminton Federation (WBF) was formed in 1978 in Hong Kong with 6 members from Africa and 13 members from Asia, including China (Teh 1977, vi). In the same year IBF had a total of 61 member countries (International Badminton Federation, 1988, pp. 23-24), more than doubled the WBF's 23 members. On 26 May 1981 the WBF and IBF met in Tokyo to ask Taiwan to assume the name of Chinese Taipeh and allow China be a member of IBF. The conditions were agreed by all and enabled the IBF to regain full control of badminton one more time (Periera 1981, 27). In 1984 China re-emerged on the Olympic stage after an absence of 32 years (Hong, Wu and Xiong 2005, 511).

After China was admitted into the IBF in 1981, its Thomas Cup team won four out of five Thomas Cup tournaments from 1982 to 1990. The first batch of players were trained by Indonesian Chinese (Hou Chia Chang, Tang Hzien Fu or Tong Si Fu and Fang Kia Xiang) who fled to China when the Indonesian authorities did not give citizenship to the Indonesian Chinese and also a Presidential Regulation disallowing non-citizens to engage in retail trade in the rural areas (Brown 2006; Adams 1979, 116). At the same time the Indonesian Chinese would have learnt the Chinese methods of training while following Chairman Mao's directives, "Promote physical culture and build up the people's health" and "friendship first, competition second" (Chen 1977, 5).

#### ***Elite sport and nation building in Korea***

The Korean Badminton Association (KBA) was established in 1957. The Association was affiliated to the IBF in 1962. The Koreans have participated in many tournaments with not much success (Ganner 1985, 267). The Korean Sports Science Institute (KSSI) was established in 1980 to do research in the areas of sports physiology, biomechanics, sports psychology, sports sociology and sports engineering (Korean Sports Science Institute, n.d.).

In 1981 Seoul was selected by the International Olympic Committee (IOC) to host the Olympic Games in 1988. The Korean Ministry of Sport was established the following year to prepare for the Asian Games in 1986 and the Olympic Games in 1988 (Mulling 1989, 90-92). From the mid-1980s onwards Korean men doubles players began winning the All England men's doubles titles in 1984, 1985, 1989 and 1990. In particular the Koreans won the ladies doubles titles consecutively from 1986 to 1991 (Badminton Association of England 1993, 48-49).

### **FOURTH PHASE OF DEVELOPMENT, 1992 – present**

#### ***The inclusion of badminton in the Olympic Games since 1992***

In 1992 badminton was admitted at the Barcelona Games as a medal sport (Ward 1992, 33). Prior to the Games countries like Malaysia and Indonesia that has never win an Olympic gold medal before, pull their resources and concentrate on training their badminton players, because they know their chances of winning a gold medal in badminton will be much better than in other sports.

#### ***The "Golden Period" of badminton in Indonesia, 1994 – 2002***

In 1985 General Try Sutrisno was elected the President of the Indonesia Badminton Association for a five-year period (Kurniadi 1993, 86). In 1987 Ardy Wiranata and Susi Susanti won the boys' singles and girls' singles events respectively at the first Bimantara World Junior Badminton Championships held in Jakarta (Ward 1988, 20). Try was re-elected again from 1989 to 1993 (Kurniadi 1993, 86). Under Try's term, a hostel and training centre was built at Cipayung. The centre had 18 courts, fully equipped gymnasium for weight training, medical services, an Olympic size swimming pool and administrative office (Boopathy, 2011).

The "Golden Period" of badminton in Indonesia began in 1990 when Susi Susanti won the All-England ladies' singles in 1990 and 1991. She was the first Indonesian lady player to win the title and also the first to win the title twice in a row. Ardy won the All England men's singles in 1991 (Badminton Association of England 1993, 48-49). In 1992 Susi Susanti won the first Olympic gold medal for Indonesia she obtained a gold medal for the ladies' singles event at Barcelona. Indonesia also took the gold, silver and bronze medals in the men's singles through Alan Budi Kusuma, Ardy Wiranata and Hermawan Susanto (Setia 1992, 21). From the years 1994 to 2002 Indonesia won the Thomas Cup five times. Indonesia also won the Uber Cup in 1994 and 1996. The team played in the finals in 1998 before losing to China (International Badminton Federation 2000, 172).

### ***The stagnation of elite badminton in Indonesia***

However, since 2008, Indonesia has not won the Thomas Cup or qualified to play in the finals. Its ladies' Uber Cup team played in the finals in 2008 but lost to China. In 2008 its training camp was temporarily closed. Its annual sponsorship fee of US\$1.5 million was insufficient to pay the players. The Association had to seek government funding because another US\$ 2.3 million was needed to run the training camp and send players to tournaments (Antara, 2009). In 2012 Indonesia failed to qualify to play in the semi-finals of the Thomas Cup and Uber Cup (Prathivi and Messakh, 2012). To make matters worse, Indonesia did not win any medal at the London Olympic Games 2012 when its players has consistently win at least a gold medal since the 1992 Games (Adamrah 2012, 2). In September 2012, trade minister, Gita Wirjawan, was elected the new chairman of the Indonesian Badminton Association for the term 2013 -2016. Gita believed he has the necessary skills to improve to improve Indonesia's badminton performance and he will focus on improving the management system (Susanto 2012, 2).

### ***The "Golden Period" of badminton in China, 2004 – 2012***

After an absence of 32 years, China re-emerged onto the 1984 Olympic Games in Los Angeles. Chinese athletes won 15 gold medals and were placed fourth in the Olympic medal table. The Soviet Union and the Democratic Republic of Germany boycotted the Games. During the 1988 Seoul Olympic Games the Chinese were very disappointed after obtaining five gold medals, after the return of two sporting superpowers, Soviet Union and Democratic Republic of Germany (Hong 2008, 34). Hence in the late 1980s the Sports Ministry devised an Olympic strategy to become a sport superpower by the end of the twentieth century. The government continued to channel the best of its resources to give special and intensive training to potential gold medallists (Hong 1998, 163).

The core of the sports system is the systematic production of more child athletes. Children from five to six years old are selected to specialised sports schools where the emphasis is on sports training from 6 to 8 hours per day. Talented school athletes are selected to join professional teams on regional and provincial level. Only the best can make it to the national team (Hong, 2004, p. 43). There are 500 elite primary schools and more than 200 elite sports middle and high schools. In 2008 about 400,000 young athletes are being trained in these schools (Hong, Mackey and Christensen 2008, 5). Only five per cent will be able to reach the top. Ninety-five per cent will leave the sport schools with no formal primary or secondary qualifications and with broken dreams (Hong, Wu and Xiong 2005, 517).

The National Training Bureau of the State Physical Culture and Sports Commission was established in Beijing in 1951. The objective of the bureau was to produce Olympic Champions. The Centre provided support for 11 national teams, including badminton (Whitby 1999, 136-137). In the mid-1990s the Sports Ministry changed its name from the State Physical Culture and Sports Commission to China General Administration of Sport. Twenty sports centres were established to manage its

training and commercial interests. In addition the central government continued to increase its financial support with the approach of the Beijing Olympic Games (Hong, Wu and Xiong 2005, 514-515).

In 1992 Olympic Games, China did not win any of four gold medals. The 1996 Games in Atlanta saw Chinese badminton reached an important milestone, when Ge Fei and Gu Jun took the gold medal for the ladies' doubles and Dong Jong won the men's singles gold (Hong, Mackey and Christensen 2008, 33-34). The Chinese won 16 gold medals and remained fourth on the gold medal at the Atlanta Olympic Games 1996 (Hong 2008, 34). China took four of the five gold medals at Sydney in 2000. and three in 2004 and 2008. China grabbed all the five gold medals in 2012 as shown in Table 2.

**Table 2:** China's Olympic medal tally for badminton, 1992-2012

Year	Host city	Gold	Silver	Bronze	Total medals
1992	Barcelona	0 (out of 4)	0 (out of 4)	5 (out of 4)	5
1996	Atlanta	2 (out of 5)	1 (out of 5)	2 (out of 5)	5
2000	Sydney	4 (out of 5)	4 (out of 5)	3 (out of 5)	8
2004	Athens	3 (out of 5)	3 (out of 3)	1 (out of 5)	5
2008	Beijing	3 (out of 5)	3 (out of 5)	3 (out of 5)	8
2012	London	5 (out of 5)	2 (out of 5)	1 (out of 5)	8

Sources: Badminton World Federation 2012; London, 2012.

From the Olympic Games 1992 to 2012, China won a total of 39 medals, twice more than Korea as compiled in Table 3.

**Table 3:** Olympic medal tally for men's and ladies' badminton events, 1992-2012

Country	Gold	Silver	Bronze	Total
<b>Asia</b>				
China	16	8	15	39
Indonesia	6	6	6	18
Korea	6	6	5	17
Malaysia	-	3	2	5
Japan	-	1	-	1
India	-	-	-	1
<b>Europe</b>				
Denmark	1	2	3	6
England	-	1	1	2
Netherlands	-	1	-	1

Sources: Badminton World Federation 2012; London 2012.

**Table 4:** Olympic medal tally for men's badminton events, 1992-2012

Country	Gold	Silver	Bronze	Total
<b>Asia</b>				
Indonesia	5	3	4	12
China	4	2	4	10
Korea	2	3	3	8
Malaysia	0	3	2	5
<b>Europe</b>				
Denmark	1	1	1	3

Sources: Badminton World Federation 2012; London 2012, 2012.

**Table 5:** China's Olympic medal tally for men's badminton singles and doubles events, 1992-2012

Year	Host city	Gold	Silver	Bronze	Total medals
1992	Barcelona	0 (out of two)	1 (out of two)	1 (out of four)	1
1996	Atlanta	0 (out of two)	1 (out of two)	0 (out of two)	1
2000	Sydney	1 (out of two)	0 (out of two)	1 (out of two)	2
2004	Athens	0 (out of two)	0 (out of two)	0 (out of two)	0
2008	Beijing	1 (out of two)	1 (out of two)	1 (out of two)	3
2012	London	2 (out of two)	0 (out of two)	1 (out of two)	3
					10 medals

Sources: Badminton World Federation, 2012; London 2012, 2012.

## Conclusion

The success of Malaya winning the Thomas Cup from 1949, 1952 and 1955 when 10 countries initially took part, can be attributed during the nineteenth century when the British first introduced the game in Singapore. It soon spread to other parts of Malaya after 1920 when each respective local Chinese, Indian, Eurasian and Malay communities formed their own badminton parties. The various state and Colony badminton associations like Penang, Perak, Singapore and Selangor were formed to organise their own closed tournaments with participants coming from the badminton parties. The first Malayan Badminton Championship held in 1937 made the game more competitive and cultivated a culture of badminton excellence. Furthermore, following the first appointment of a superintendent of Physical Education in Malaya, badminton was introduced in the school system in 1930.

After China was admitted into the IBF in 1981, its Thomas Cup team won four out of five Thomas Cup tournaments from 1982 to 1990. The first Chinese Thomas Cup team were trained by several Indonesian Chinese players who fled to China when they were not given citizenship and license to do business. It was a likely combination of "indigenous knowledge", Chinese methods of training and Communist ideology and culture.

Continuous culture of technological innovation

Since the early 1980s

## Recommendations

Men's singles

1992	1996	2000	2004	2008
Alan Budi Kusuma			Taufik Hidayat	
Ardy Wiranata		Hendrawan		Lee Chong Wei
Hermawan Susanto	Rashid Sidek		Sony Dwi Kuncoro	

## Men's doubles

1992	1996	2000	2004	2008
	Ricky Subagia & Remy Maniaky	Tony Gunawan & Chandra Wijaya		Kido Markis & Setiawan Hendra
Eddy Hartono & Rudy Gunawan	Cheah Soon Kit & Yap Kim Hock			
Razif Sidek & Jailani Sidek	Antonius & Deny Kartono		Eng Hian & Flandy Limpele	

## Ladies singles

1992	1996	2000	2004	2008
Susi Susanti				
	Mia Audina		Mia Audina	
	Susi Susanti			Maria Kristin Yulianti

**Quality versus quantity**

## References

- Adamrah, M. 2012. Indonesia's badminton hall of shame. *Jakarta Post*, August 15, 2.
- Adams, Bernard. 1979. *The badminton story*. London: British Broadcasting Corporation.
- Anon. 1876. Ball to H.M. 10<sup>th</sup> Regiment. *Straits Times Overland Journal*, February 24, 3.
- Anon. 1897. Advertisements. *Straits Observer*, July 16, 6.
- Anon. 1898. Advertisements. *Singapore Free Press and Mercantile Advertiser*, August 2, 2.
- Anon. 1899. Advertisements. *Straits Times*, April 13, 4.
- Anon. 1921. Amateur Sporting Association. *Singapore Free Press and Mercantile Advertiser*, January 14, 12.
- Anon. 1924. Badminton. *Singapore Free Press and Mercantile Advertiser*, July 11, 12.
- Anon. 1928a. Badminton Championships. *Singapore Free Press and Mercantile Advertiser*, July 21, 12.
- Anon. 1928b. Untitled. . *Singapore Free Press and Mercantile Advertiser*, August 22, 20.
- Anon. 1929a. Untitled. *Straits Times*, May 27, 9.
- Anon 1929b. Untitled. *Straits Times*, May 27, 7.
- Anon. 1934a. Growth of the Amateur Sporting Association. *Singapore Free Press and Mercantile Advertiser*, July 11, 12.
- Anon. 1934b. Selangor triumphs T.T. *Straits Times*, November 18, 19.
- Anon. 1934c. Malayan Badminton Association formed. *Straits Times*, November 13, 14.



- Anon. 1934d. Malayan Badminton Association. *Singapore Free Press and Mercantile Advertiser*, November 14, 16.
- Anon. 1937. Singapore Stars Defeated in Badminton Championships. *Straits Times*, December 6, 16.
- Anon. 2009. Li Ning Company and the Chinese National Badminton Team join together. *PR Newswire*, April 24, 1.
- Antara. 2009. Indonesian shuttlers secure sponsorship boost. *Jakarta Globe*, January 5.
- Badminton Association of England. 1993. *Yonex All England Open Badminton Championships, 17<sup>th</sup> – 20<sup>th</sup> March 1993*. London: Connect Sports Ltd.
- Badminton Correspondent. 1935. Inter-school badminton. *Straits Times* July 28, 18.
- Badminton World Federation. 2010. *Request for proposal: BWF media rights agency*. Kuala Lumpur: BWF.
- Badminton World Federation. 2011. Past results. <http://www.bwfbadminton.org/page.aspx?id=14900> [accessed 11.3.2011].
- Badminton World Federation. 2012. <http://www.bwfbadminton.org/page.aspx?id=14900>, [accessed 11.3.2011].
- Berg, Torsen. 2009. From 9 to 166: The family grows. In *International Badminton...The First 75 years*, ed. World Badminton Federation. Kuala Lumpur: BWF.
- Boopathy, K. M. 2011. Selvaraj impressed with Indonesia's facility. *New Straits Times*, July 4.
- Brown, Collins. Playing the game: ethnicity and politics in Indonesian badminton. *Indonesia* Vol. 81: 71-93.
- Chen, Fu Shou. 1977. The fundamental principles and methods of badminton coaching. In *First coaching seminar: Peking, China March 26 – April 2, 1977* ed., Teh Gin Sooi, 5-10. Kuala Lumpur; Asian Badminton Confederation.
- China Badminton Association. 1978. *Flowers of friendship blossoming in world badminton*. Peking: Badminton Association of the People's Republic of China.
- Correspondent. 1874 Club Crackers and Square Squibs. *Straits Times Overland Journal*, July 11, 6.
- Cranna, L. G. 1921. Singapore YMCA. *Straits Times*, March 24, 11.
- Crego, Robert. 2003. *Sports and Games in the 18<sup>th</sup> and 19<sup>th</sup> Centuries*. Westport: Greenwood Press.
- Editor. 1931. Local badminton championships. *Straits Times*, December 8, 13.
- Editor. 1934. Malayan Badminton Association. *Singapore Free Press and Mercantile Advertiser*, November 14, 16.
- Flower, Raymond. 2002. *The Y.M.C.A.: First 100 Years in Singapore 1902-2002*. Singapore: Young Men's Christian Association of Singapore.

- Ganner, M. 1985. *World badminton almanac No 1*. Hants: M.G. Books.
- Guillain, Jean Yves. 2004. *Badminton: An illustrated history*. Paris: Publibook.
- Hong, Fan 1998. The Olympic movement in China: ideals, realities and ambitions. *Culture, Sport and Society*, 1 (1): 149-168.
- Hong, Fan. 2004. Innocence lost: child athletes in China. *Culture, Sport and Society*, 7 (3): 338-354.
- Hong, Fan. 2008. China. In *Comparative elite sport development: systems, structures and public policy*, ed. B Houlihan & M. Green, 27-52. Oxford: Butterworth-Heinemann.
- Hong, Fan. 2010. China. In *Routledge companion to sports history*, ed. S. W. Pope and John Nauright, 405-419. Oxford: Routledge.
- Hong, Fan., P. Wu, & H. Xiong. 2005. Beijing ambitions: an analysis of the Chinese elite sports system and its Olympic strategy for the 2008 Olympic Games. *The International Journal of the History of Sport*, 22 (4): 510-529.
- Hong, Fan, D. Mackay & K. Christensen. 2008. *China gold: China's quest for global and Olympic glory*. Great Barrington: Berkshire Publishing Group.
- International Badminton Federation. 1988. *IBF Statute Book 1987-1988*. Cheltenham: IBF.
- International Badminton Federation. 2000. *Statutes 1999-2000*. Cheltenham: IBF.
- Jefferson, J. W. 1948. The School Medical Service and Physical Training in Malaya. In *Education in Malaya*, ed. Institute of Education, 49-52. Kuala Lumpur: Government Printing Office.
- Korean Sports Science Institute. n.d. *Korea Sports Science Institute*. Seoul: KSSI.
- Kurniadi, Titus. 1993. *Emas di Barcelona emas di hatiku: sewindu pengabdian kepada bulutangkis*. Jakarta: Titus Kurniadi.
- Lim, Peng Han. 2013. The development of badminton as a globalised game an the dominance of Chinese and Korean female badminton players and teams in Uber Cup competitions and the Olympic Games competition: challenges for ASEAN countries to improve elite badminton training to compete and overcome these leading players and teams. In *Proceeding: ASEAN University Sports Council International Conference 2012, 13-14 December, Don Chan Palace, Lao PDR*, ed. Saharudin Ismail and Nor Aziina Mohd Zubaidi, 61-73. Putrajaya: Kementerian Pengajian Tinggi.
- London 2012. (2012). Badminton – medals. Retrieved from Badminton World Federation website: <http://www.london2012.com/badminton/medals/>
- McCormack, Mark. 1993. . *IMG Corporate report*. Cleveland: Mark McCormack Group of Companies.
- Mulling, C. 1989. Sport in Korea: *Ssirum*, the YMCA, and the Olympic Games. In *Sport in Asia and Africa: a comparative handbook*, ed. E. A. Wagner, 83-99. New York: Greenwood Press.
- Ogbrun, William Fielding. 1937. Culture and sociology. *Social Forces* Vol 16, no. 2: 161-169.
- Ong, Kah Kuan. 1984. *We were great: Thomas Cup badminton*. Kuala Lumpur: Federal Publications.
- Periera, Bernard. 198. Bouquets and brickbats for shuttle body. *Straits Times*, June 17, 27.

- People's Publishing House. 1974. *China's badminton*. Peking: People's Sport Publishing House.
- S
- Prathivi, N. 2012. PBSI welcomes criticisms, suggestions from local legends. *Jakarta Post*, May 30.
- Scheele, H. A. E. 1954. The origins and growth of badminton. In *Badminton*, ed. Neol Redford, 1-5. London: Pitman and Sons.
- Setia, P. 1992. Susi, kami terharu. Tapi... *Tempo*, 24 (22): 21.
- Siebel, Norman. 1964. BAM's new standing committee grows from seven to 17. *Straits Times*, November 13, 19.
- Susanto, S. 2012. Gita elected PBSI's new chairman. *Jakarta Post*, September 22, 2.
- Teh, G. S. 1977. *First coaching seminar: Peking, China, March 26 – April 2, 1977*. Kuala Lumpur: Asian Badminton Federation.
- Ward, Roy 1988. Bimantara World Junior Invitation: Indonesians, Ardy and Susi dominate. *World Badminton*, 16 (1): 20.
- Ward, Roy.1992. Badminton long march to the games. *Olympic Review*, 291, 32-35.
- Ward, Roy. 1996a. 1996 international calendar. *World Badminton* Vol 23, no. 4: 2.
- Ward, Roy. 1996b. 1996 international calendar. *World Badminton* Vol 24, no. 2: 2.
- Whitby, D. 1999. Elite sport. In *Sport and physical education in China*, ed. J. Riordan & R. Jones, 120-141. London: E & FN Spon.
- Winstedt, R. O. 1931. *Straits Settlements Annual Report on Education for the Year 1930*. Singapore: Government Printing Office.
- Woodrow, R. 1985. 'Tunku' remembers. *Asiaweek*, 11 (19): 52-54.

# MANIPULATIVE MOTIONS OF 2010 ACADEMIC YEAR PJKR STUDENTS ABILITY OF NET TEACHING LECTURING

Amat Komari

Yogyakarta State University, Indonesia

## Abstract

There are still many students mastering manipulative motions that lead to netting game learning materials. The main objective of this study is to determine the ability of students participating in manipulative motion net teaching 2010. The design of this research study is descriptive. The variables of this study are the ability of students participating in manipulative motion Net Teaching in class 2010. The population in this study is PJKR students who are taking net game teaching lecturing of 240 students. The samples in this research are 160 students taken with random cluster sampling technique. The instrument used in this study is the shuttlecock juggling test. This test is compiled by the researcher himself. The validity and reliability of the test results are obtained. The validity was obtained by test re - test techniques, and acquired validity by correlating with the test results with standard instruments. The data analysis technique used in this research is descriptive statistics further described by percentage. Based on the research results and the conclusions, it can be concluded that the majority of students of the PJKR courses who take net game teaching have the basic manipulative ability motion shown by the percentage that is reached by 63.13%. While students with lower abilities are more numerous when compared with students with high manipulative basic move ability for 20.63% for low ability and at 16.25% for high ability.

**Keywords:** manipulative move, net games

## INTRODUCTION

One of the courses in the 2009 curriculum for Health Physical Education and Recreation Study Program of Sport Sciences Faculty, Yogyakarta State University is listed as Net Games course coded as PJD 205 with the amount of 2 credits of semester. In the nature of the net game, it is a game that uses a barrier net as separators between the player/team with the other player/team and they are trying to drop objects onto the field the opponent. Some net games have been known by many people such as Badminton, Table Tennis, Lawn Tennis, Volleyball, and Sepak Takraw, but for the children's learning, a teacher provides materials that has been modified, but the main idea is still the same net game with these characteristics:

1. *Rallying* which is each player/team is trying to return/take across an object used as a means of this net game.
- 2 *Playing to the ground* which is that each team or player is trying to immediately drop the objects to the opponent's field.

This kind of game is very interesting to the students because there is a sense of excitement and they are able to actualize themselves in the classroom. According to Grout & Long (2009: 64) strategies in learning will be best managed by combining such stimulation and challenging planning and it will lead to minimize such juvenile delinquency. Creativity of the teachers is needed and they use a modified net games for its learning material, it will make the students more excited for the game through modifications to adjust to the situation and condition of the students such as:

1. Skills are taught in accordance with the existing capabilities in the students themselves, for example by using two hands to throw the volleyball, is considered easier than bouncing it with both hands just like doing a passing down.

- 2 . Equipment that could be used to hit a simple example does not have a badminton racket, then through modification could use the runway for slicing (cutting board)/which can be important for the hit.
- 3 . Objects can be moved much easier by using the old knitting cloth which is like a ball, combined well with the former shuttlecock .
- 4 . Unused area can be functioned as the field of net games, and it can be in the open space as well.
- 5 . As the pole barrier for the net, it should not be made of iron, but it can use the trees and tie the net substitution on to the trees, it can be a substitute for the net pole. Even, the barrier can be made of colorful raffia for a more interesting game.
- 6 . Terms of motion can be varied. For example, if you play some net game instead of volleyball, you don't have to use your hands. You can take across the ball to by using your head, shoulders, or even legs in this net game.
- 7 . Taking some outstanding position to take across the object is allowed. You can find some special position such as facing sideways or back to the net and it is adapted to its purpose as well as the level of difficulty.

Based on its easiness in playing the net game, some students may be attracted to engage in the activity of playing the net game longer so the students can do net play in their neighborhood. In Indonesia, the net game which is liked by many people is the game of badminton. It is badminton that Indonesian contingent has won many medals in such competition. Even, the Indonesian badminton athletes were able to get the Olympic gold medal.

Since this sport is able to raise the prestige and pride of Indonesia today, it is expected that through teaching the net games, it can facilitate a child to find it easier to move and play the game of badminton. In some of the early meetings, the students are still difficult to hit the shuttlecock with the right timing. Many of them are failed to do it properly, since from their childhood, they were not widely introduced to the game of badminton.

The problems that should be faced is about how much the ability needed to do such manipulative motion in front of the net in this case to hit the shuttlecock. Even they should try to juggling with the shuttlecock. The main objective of this study was to determine the ability of college students in doing such manipulative motion as they are included in the program of Net Teaching for the year of 2010.

Some of the net games that have been commonly known by the community are Badminton, Table Tennis, Lawn Tennis, Volleyball, and Sepak Takraw, but for children's learning, a teacher provides the materials as they need to modify the net game, but the basic idea is the same game which is the (1) Rallying when each player / team trying to return/take across an object used as a plaything. (2) Playing to the ground when each team or player trying to immediately drop the objects to the opponent's area.

The type of skills that can be expected to be presented or developed in this learning model is as follows:

**Table 1. Tactical capabilities that can be improved by studying the material of the game**

**Figure 1: Suggested progressive principles underlining the tactical play within the four games categories.**

<b>G A M E C A T E G O R I E S</b>					
<b>TARGET</b>	<b>NET/WALL</b>	<b>STRIKING/FIELDING</b>		<b>TERRITORY/INVASION</b>	
		<b>Batting</b>	<b>Fielding</b>	<b>With object</b>	<b>Without object</b>
1. <b>AIM to target</b>	1. <b>CONSISTENTLY</b> return the object	1. <b>SCORE RUNS</b>	<b>STOP SCORING</b> RUNS	1. <b>SCORE</b>	<b>STOP SCORING</b>
2. <b>PLACEMENT</b> in relation to target and other obstacles	2. <b>PLACEMENT</b> of object and <b>POSITIONING</b> based on placement	2. <b>ACCURACY AND</b> <b>DISTANCE OF BALL</b> HIT	<b>MAKE HITTING</b> <b>THE BALL</b> <b>DIFFICULT</b>	2. <b>INVADE</b>	<b>STOP INVADING</b>
3. <b>SPIN and/or</b> <b>TURN</b>	3. <b>SPIN and</b> <b>POWER</b>	3. <b>AVOID</b> <b>GETTING OUT</b>	<b>GET BATTER</b> <b>OUT</b>	3. <b>KEEP</b> <b>POSSESSION</b>	<b>GET</b> <b>POSSESSION</b>

When we see from the table above, it is noticed that the tactical capabilities of the model can be developed relatively in this game compared to the other models, named: (1) Consistency in return the object to be one determining factor, other factors, named (2) object placement and placement position based on the object to be received or released, and (3) development of the ability to hit a spin and power.

### **The Nature of Basic Manipulative Motion**

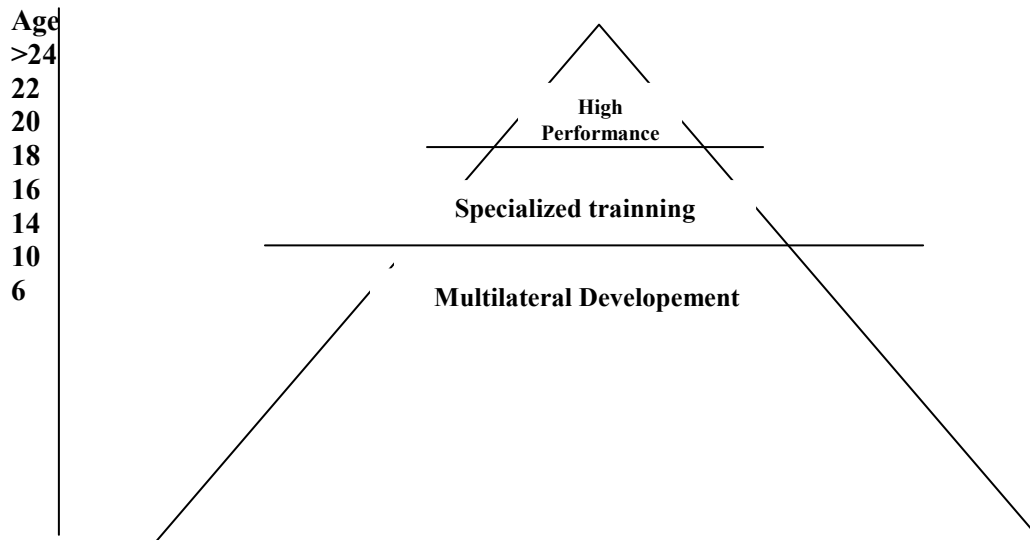
Basic manipulative motion is a form of human basic moves. This human basic move can be categorized into three types called motion locomotor, non-locomotor and manipulative. If we identify these three types further, it will be found the types of moves that are included in these three basic motion as presented in the table below.

**Table 2. Kinds of motion based on the basic motion.**

No	Type of Moves	Basic Motions
1	Lokomotor	walking, running, jumping, crawling
2	Non lokomotor	pulling, pushing, stretching, twisting, bending
3	Manipulative	kicking, throwing, catching

Based on the table above, it can be concluded that this type of move is a basic motion as it uses some organs to manipulate the objects, objects that can be manipulated can be seen in these moves: (1) Kicking, (2) Throwing (3) Catching (4) Spikes or smashes in the volleyball games, badminton or lawn tennis and table tennis.

Development of basic motion is needed to support the appearance of motion of each child. In addition to support their motion in physical education teaching, coaching basic motion is a fundamental element in the development of sports achievement especially for children ages 6 to 12/14 years old as it is presented by this following Bompas figure;



By studying the games that exist in this type of net game, it is hoped that someone is able to understand the characteristics of this game. The characteristics of tactical skills that can be developed in this game is consistency, or the ability to do a rally in playing ball or other object that is used as a medium in the game. By understanding it, it is hoped that the person might be able to play a kind of rally in the game with such amazing skills. Another skill that is very important in this game is the ability in making the placement of the ball and do a good posture in relation to the placement of the ball or other objects from the opponent.

## RESEARCH METHODS

The design of this study is descriptive one. Research that describes the current situation is in progress (Suharsimi 2005:234) situation that took place in this study is the ability of motion Motion manipulative manipulative variable in this study is defined as the ability to perform a movement rally did use shuttlecock juggling with the paddle board to then calculated achievement in number. The population in this study is PJKR students who are taking courses of Teaching Net Games and it is amounted for 240 students. The sample in this research were 160 students drawn by cluster random sampling technique.

### Research Instruments and Data Collection Techniques

The instrument used in this study is the shuttlecock juggling test. This test is compiled by the researcher. The validity and reliability of the test results will be obtained. Validity is obtained by employing test re-test technique. And validity is found by correlating the test results with the instruments standard.

Data analysis techniques used in this research is descriptive statistics technique and it is further described with percentages. The formula categorization research results obtained by using the following formula according to B. Syarifudin (2010: 112).

**Table 3. Criteria for the classification of research results**

Category	Score Range
High	$X \geq M + SD$
Medium	$M - SD \leq X < M + SD$
Low	$X \leq M - SD$

## RESEARCH RESULTS AND DISCUSSION

Based on the research data, it can be noticed a few things that can be said as a result of the research. The results of this research are; (1) the results of the analysis of the validity and reliability of the data, (2) the results of data analysis towards the study results, (3) the results of the data analysis towards the research results in terms of the sex of the study sample. The following research data will be presented in the order as presented above.

### The results of the analysis of validity and reliability of research data

The data were then analyzed with statistical techniques Pearson Product Moment Correlation . The first result is to analyze the reliability of the data . The data analyzed are the results of the test and re - test the student 's ability in doing manipulative motion, this correlation analysis is supported by SPSS software series 19 with the result that for reliability is 0.706 . These results are considered either as a reliability analysis . In addition to the analysis of data to determine the reliability, data analysis was also performed to determine the validity of the test results by the way of research data correlate with the results of studies using standardized instruments. Just like any analysis to find reliability, it analyzes the data to find validity and it is also done with the help of SPSS software series 19, while the results gained are 0.406, this result is quite no good, but for the sake of completing the fulfillment of the research, this validity of the data is used for a while.

### The results of the data analysis towards manipulative skills of PJKR students who take the courses teaching the net game

The second stage of the analysis process is to analyze the data from the test with instruments that had been developed well. The data generated from this study is the data test and retest. As the material in this analysis, the researchers conducted a preliminary analysis of the data to determine the best results from the students. After that, the analysis is started to do. The first analysis conducted by the researchers is to calculate the Mean and Standard Deviation of the data. Results obtained from the analysis is the amount of 53.1 Mean and its Standard Deviation is 7.5. After the data is gained, the next step is to try to confirm the Mean and Standard Deviation into the formula to categorize the results of the study. The results of the data analysis and description of the data results manipulative skills all students are as presented in the following table ;

**Table 4. Research Data Description**

No	Score Range	Frequency	Percentage (%)	Category
1	$\geq 61$	26	16.25	High
2	47 - 60	101	63.13	Medium
3	$\leq 46$	33	20.63	Low
	Total	160	100	

Based on the data above, it can be seen that the majority of PJKR students who are taking the course of Teaching Net Games has the ability of manipulative motion in the level of "Medium". It is demonstrated by the high percentage that reached 63.125%. While students with less manipulative abilities are more higher than the students with good manipulative skills. It is indicated by a greater percentage for about 4.38%. If the data is presented in the form the diagram, it can be seen in the figure below;



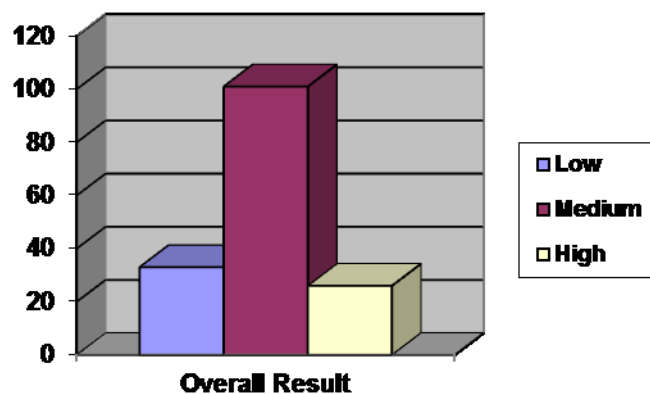


Figure 2. Diagram of research data description

#### The results of the analysis by gender (Male)

The third stage of the analysis process is to analyze the test data with instruments that have been developed based on their gender and it is started with the gender of male. Results obtained from the analysis is the amount of 53.1 Mean and Standard Deviation of 7.5. After the data is gained, the next step is to try to confirm the Means and Standard Deviation into the formula to categorize the results of the study. The results of the data analysis and description of the data results manipulative skills all students are as presented in the following table;

Table 5. Research Data Description Male Students Group

No	Score Range	Frequency	Percentage (%)	Category
1	$\geq 61$	26	20.97	High
2	47 - 60	81	65.32	Medium
3	$\leq 46$	17	13.71	Low
	Total	124	100.00	

Based on the data above, it can be seen that most of the male PJKR students who are taking courses Teaching Net Games has the ability of manipulative motion in "Medium" level. It is shown by the percentage that reached 65.32%. While students with high manipulative abilities are more higher than the students with less manipulative abilities. It is indicated by a greater percentage for about 7.26%. If the data is presented in the form the diagram, then it can be seen in the figure below;

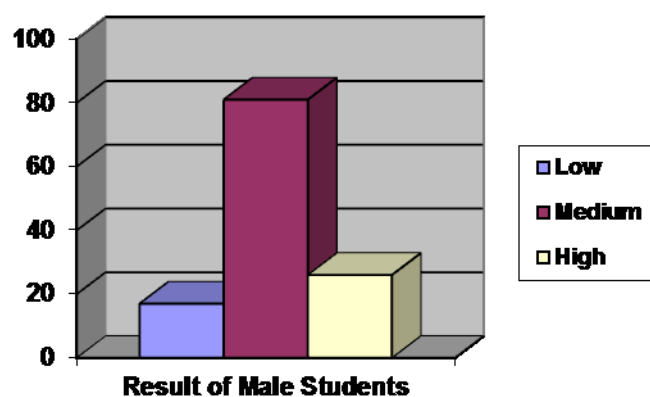


Figure 3. Diagram of research data descriptions for male students

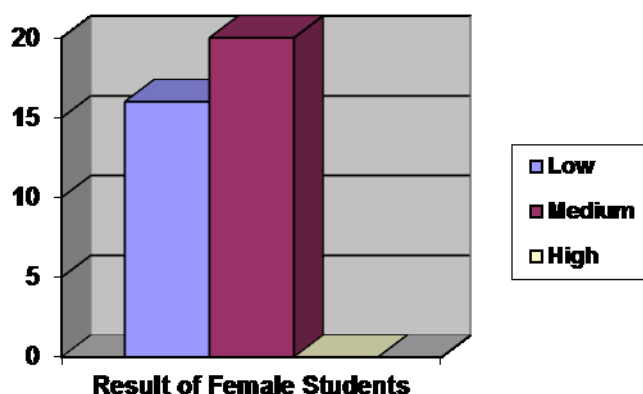
### The results of the analysis by gender (Female)

The third stage of the analysis process is to analyze the test data with instruments that have been developed based on their gender and it is the turn for female students. Results obtained from the analysis is the amount of 53.1 Mean and Standard Deviation of 7.5. After the data is gained, the next step is to try to confirm the Means and Standard Deviation into the formula to categorize the results of the study. The results of the data analysis and description of the data results manipulative skills of all female students are presented in the following table.

**Table 6. Research data description for female students group**

No	Score Range	Frequency	Percentage (%)	Category
1	$\geq 61$	0	0.00	High
2	47 - 60	20	55.56	Medium
3	$\leq 46$	16	44.44	Low
	Total	36	100.00	

Based on these data, the female PJKR students who are taking the course of Teaching Net Games has the ability of doing manipulative motion in the level of "Medium". This is shown by the percentage that reached 55.56%. While students with the classification of ability in doing the manipulative motion in the level of "High" does not exist. The students with the ability in doing the manipulative motion in the level of "less" are so many as it is shown by the percentage that is equal to 44.44%. When it is viewed from the difference between the students with the ability to "Medium" and "Low" are only 11.12% difference. It demonstrates that the ability of female students in terms of the manipulative move tends to be less.



**Figure 4. Diagram of research data description for female students**

### Discussion

Based on the review of the results of this study, it is known that the manipulative motor skills students are mostly in the amount of 63.13%. While the results of manipulative movement is to declare that the students has the low level in doing this motion since the percentage shows that it is found more than those students with high level in doing this manipulative motion. The percentage is 20.63% for the low level in doing the manipulative motion and 16.25% for the high level in doing the manipulative motion. It reflects that the ability of the students included is in the normal curve. Because everybody has the capability in doing the manipulative motion for the level of high, medium and low. However, perhaps due to the factors of fatigue, the results obtained tend to accumulate in the medium category. Even so anyway, when it is compared between high and low categories , it is found more in low

category could be caused by the ability of the students who are relatively low, especially in the case of bouncing the shuttlecock with the reflective board.

The ability of doing the manipulative motion for the male students mostly tends to follow the overall capability, it is in the position of the amount of 65.32%. While the comparison for the male students with manipulative motion between high and low level is considered that male students with high level in doing the manipulative motion is much higher which is about 20.97% compared to 13.71% of those who are in the low level in doing this manipulative motion. It can be analyzed that the male students' ability in terms of manipulative movement skills tend to be better than the overall results. In addition, it is also possible that the male students have more experience and a motion similar to the motion of the skills being tested. When analyzed based on daily activities, it is also possible that male students are able to do such manipulative moves in their ordinary activities that support this move as it is tested.

The study on the overall results of the student's ability can be predicted that the contributor for the low level in doing this manipulative basic motor skills is the female students. Based on the results of the study, there is no any female student who has a high basic motor skills, while being relatively basic motor skills almost equal in number to the low level for manipulative move capabilities. It can be studied in reverse with a review of the male students', that is, the female students tend to have an experience relatively less in terms of doing the manipulative motion compared to the male students.

## Conclusion

Based on the research results, it was concluded that the majority of PJKR students who take the courses of teaching net games have the basic motion manipulative ability in the level of medium as it was shown by the percentage that reached 63.13%. While students with lower abilities more numerous when compared to students with basic motion capabilities manipulative steeper in the amount of 20.63% for the low level of doing the manipulative motion and 16.25% for the high level of doing the manipulative motion.

## REFERENCES

- Bompa, Tudor.O. (2000). *Total Training for Young Champions*. USA: Human Kinetics.
- B. Syarifudin. (2010). *Panduan TA Keperawatan dan Kebidanan dengan SPSS*. Jakarta: Grafindo Litera Media.
- Harrow, A.J. (1976). *A Taxonomy of the psychomotor domain*. New York & London: Longman.
- Harvey Grout & Gareth Long, (2009) *Improving Teaching and Learning in Physical Education*, Typeset by Kerry Press, Luton Bedfordshire Printed and bound in the UK by Bell and Bain Ltd Glasgow.
- Michael W Metzler (2011) *Instructional Models For Physical Education*: Holcomb Hathaway, PublisherScottsdale Arizona.
- Suharsimi Arikunto (2005). *Manajemen Penelitian*. Jakarta ; Rineka Cipta.
- Tim Pengembang Kurikulum FIK UNY. (2009) *buku kurikulum prodi PJKR dan PGSD Penjas FIK UNY*. Yogyakarta: FIK UNY.
- [www.curriculumsupportededucation.nsw.gov](http://www.curriculumsupportededucation.nsw.gov)
- [www.web.uvic.ca](http://www.web.uvic.ca)

# **ABILITY OF PHYSICAL EDUCATION TEACHERS IN IMPLEMENTING LEARNING OUTDOOR EDUCATION (STUDIES IN OUTDOOR EDUCATION TRAINEES)**

**Aris Fajar Pambudi**

**Yogyakarta State University  
arisfajar22@gmail.com**

## **Abstract**

This research was motivated by the lack of implementation of the special education classes in various educational unit. This study aims to provide an overview of the capabilities Elementary School Physical Education Teachers in Implementing Learning Outdoor Education. This research is descriptive quantitative. The method used in this study is a survey method of data collection techniques such as questionnaires. The population in this study is a Physical Education teacher elementary school Kebumen district, Central Java totaling 33 people. Research shows 2 teachers in the category of less than once with a percentage of 5.71%, 8 teachers in the category of less with a percentage of 22.86%, 11 teachers in the category of being with a percentage of 31.43%, 11 teachers in good category with a percentage of 31.43% and 1 teacher in the category very well with a percentage of 8.57%.

**Keywords:** physical education, learning, outdoor education

## **INTRODUCTION**

Lessons are taught physical education in schools targeted towards the harmony between body growth and mental development and is an attempt to make the Indonesian nation to be a nation of healthy, strong and unseen, and can be given to all types and levels of schooling. Implementation of Outdoor Education or Education outside the classroom / Outdoor Education / activities outside the classroom in various educational units is still very low, even if it is virtually never implemented .

Outdoor education activities only serve as an additional activity to fill the void after the semester exams. Rusli Lutan and Adang Suherman (2000: 1), the process of teaching physical education through physical activity and at the same time as well as the instructional process to learn physical skills. Meanwhile, according to Abdul Gafur (1983) cited by Arma Abdoellah and Agusmanadji (1994: 5), physical education is an educational process of a person as an individual and as a member of society who made consciously and systematically through an intensive physical activity in order to obtain increased capacity and physical skills, the growth of intelligence and character formation.

Physical education is a learning process that is designed to improve physical fitness, develop motor skills, knowledge and active living behaviors and sportsmanship through physical activity. Outdoor education can be used as a new alternative in improving the quality of human knowledge in the achievement . The problem that arises is the lack of ability to carry out physical education teachers in elementary schools teaching outdoor education. It is characterized by the lack or have never done learning outdoor education as stated in the Standards of Competence and Basic Competence in the curriculum. The reluctance of physical education teachers in implementing outdoor education learning can be influenced by ignorance about the concept and purpose of outdoor education. This approach uses the life outdoors and camping activities, which provide many opportunities for students to acquire and master the various forms of basic skills, attitudes and appreciation of the various matters contained in the natural and social life. Forms outside the classroom activities can include: camping, hiking, exploring, fishing, cooking, nature study, living in the countryside,

Based on the above problems, researchers are interested in knowing the ability of physical education teachers in implementing outdoor education learning. This study was conducted after physical education teacher on Kebumen district who gets outdoor learning training education. Education outside the classroom not just move out of the classroom lessons, but it is done by getting students at one with nature and doing some activity that leads to the realization of student behavior change to the environment through the stages of awareness, understanding, caring, responsibility and action or behavior. Outdoor education can be in the form of games, stories, sports, experimentation, race, recognize environmental cases and discussion surrounding the excavation solutions, environmental action, and roaming environment.

Education outside the classroom is defined as education that takes place outside the classroom that involve the participation of experience that requires students to follow the adventures that challenge the basis of outdoor education such as hiking, mountain climbing, camping, etc. Education outside the classroom contains philosophy, theory and practical educational experience and environment. Outdoor learning approach using the outdoors as a medium setting. The process of using nature as a medium of learning is considered very effective in knowledge management where everyone will be able to feel, look directly can even do it yourself, so that the transfer of knowledge based on experiences in nature can be felt, translated, is developed based capabilities. This approach hone physical and social activity in which the child will be doing a lot of activities that indirectly involve cooperation among friends and creative abilities.

## **RESEARCH METHOD**

Research using survey research methods by using the questionnaire as a criterion. Research is intended to determine the ability of physical education teachers in implementing the learning activities outside of school physical education teacher District of Kebumen. The approach used in this research is descriptive quantitative. Descriptive study was not intended to test the research hypothesis but rather describes the state as it is on a variable, symptoms or circumstances. To achieve the research objectives, need to know first research variables, variables will be the object of research or factors that play a role in the events that will be measured. Broadly speaking, the study variables to be studied is the Ability of Physical Education Teachers in Implementing Learning Learning Activities Outside the School, namely Ability and skill physical education teacher in the learning process is done outside the classroom or outdoors, by utilizing existing equipment so as to bring creativity and acquire knowledge as well as recreational measured using a questionnaire.

### **Place and Time Research**

This study was planned to be implemented in Unit Department of Education district Kebumen Regency Kebumen. Research time from October to November 2013, and the time of data collection in November 2013.

### **Population and Study Sample**

The population in this study were all teachers in Elementary School District Education Office Kebumen, district Kebumen that follow Training Learning Learning Outside School Activities totaling 33 teachers. All trainee sample used in the study amounted to 33 people.

### **Data Collection Techniques**

In this study, data collection technique using a questionnaire (questionnaire). Suharsimi Arikunto (2006: 151) questionnaire or the questionnaire is a question or statement used to

obtain information from respondents in terms of their personal statements, or things that he knows.

### **Data Analysis Techniques**

The research data in the form of scores are knowledge, perception and skills Ability to represent the physical education teacher in the learning process is done outside the classroom or outdoors, by utilizing existing equipment so as to bring creativity and gain knowledge as well as recreation.

### **Testing Instruments**

The trial is intended to determine whether the instrument instrument is composed completely valid. Both the poor instrument is shown by the level of validity and level of reliability. Any 3 basic steps that must be considered in preparing the instruments, namely: defining the construct, investigate and formulate factors grains have a question or a statement .

1. defining construct

Construct a stage in the research is aimed to give the meaning of the construct boundaries to be studied, so eventually there will be no deviation from the objectives to be achieved in the study. Construct in this study is the ability of physical education teachers in implementing the learning activities outside of school physical education teacher District of Kebumen.

2. investigate factors

Investigate the factors is a step that aims to characterize the factors suspected then believed to be a component of the construct to be studied. Factors that support the ability of physical education teachers in implementing the learning activities outside of school are;

- a) Factors that comes from within each individual or PE teacher (intern), which consists of physical and psychological factors.

- b) The factor that comes from the outside in each individual or PE teacher (external), which includes: the student, the school environment, equipment and learning materials outside of school activities.

3. Arrange the grains questions

Formulate the questions is the last step of the preparation of the questionnaire, namely the translation of all the factors in the questionnaire, so as to limit the test items were compiled from a relevant factor .

### **Test the validity and reliability of the instrument**

An instrument is said to be valid if it is able to measure what should be measured. To test the validity of using a product moment correlation statistics Cronbach alpha formula. In this study, a questionnaire was tested in the District 30 elementary school teachers who have training Kebumen Outdoor Learning school. Of 30 questions that tested questionnaire, no matter who is disqualified 7. Due to time and budget constraints, the researcher uses only 23 questions from a questionnaire that had been tested and that has been declared invalid. Of the 23 that already represents about each indicator questions on the questionnaire.

The collected data is then analyzed quantitatively. Data obtained and expressed in the form of a percentage. Descriptive statistics were used to analyze statistical data in ways that describe or depict the data that has been collected as is without intending to make conclusions that would apply to the public. Research conducted on the total sample questionnaire is distributed questionnaire containing statements consist of four alternate answer choices is the answer strongly agree, agree, disagree, strongly disagree.

**Table 1. Ability questionnaire grilles of Physical Education Teachers in Implementing Outdoor Learning School in the District Physical Education Teachers Kebumen.**

Variable	Factor	Indicator	Item Questionnaire	Total
Ability of Physical Education Teachers in Implementing School Outdoor Learning in Physical Education Teacher District of Kebumen Kebumen	1. Intern	teacher Teaching process	1, 2, 3, 4, 5, 6, 7	7
		mastery of the material	8, 9, 10, 11, 12	5
	2. Ekstern	student - psychological	13, 14, 15, 16, 17, 18, 19	4
		- physical		3
		School Environment - Completeness of facilities or equipment	20, 21, 22,	3
		- location	23	1
		- Environment	24,25,26	3
		School curriculum	27, 28, 29, 30	4
Total				30

Furthermore, the data is processed by means of descriptive analysis. For ease of tabulation, then the answer is quantitatively altered by giving a number ( score ) on each item statement , scores for positive statements , strongly agree answers were given a score of 4 , the answer was given a score of 3 agree , disagree answers were given a score of 2, and so did not answer agreed were given a score of 1, while scores for negative statements strongly agree answers were given a score of 1, the answer was given a score of 2 to agree , disagree answers were given a score of 3, and strongly disagree answers were given a score of 4.

**Table 2. Answer Score**

alternative Answers	Code	Answer Score	
		Positive	Negative
Strongly agree	SS	4	1
agree	S	3	2
disagree	TS	2	3
Strongly disagree	STS	1	4

## REASEACH RESULT AND DISCUSSION

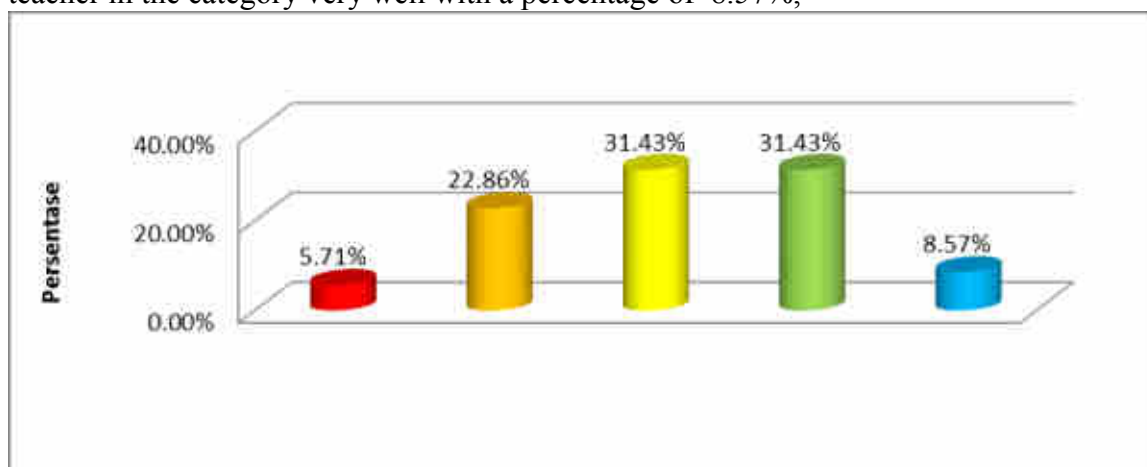
This study was conducted to determine the ability of Physical Education Teachers in Implementing School Outdoor Learning in Physical Education Teacher District of Kebumen. This research was conducted in the District Kebumen, Central Java. The data showed that a minimum score of 64, maximum score 85, average 74.11, and the standard deviation (SD) of 5.38. Data obtained from these tests are used to categorize into five categories: excellent,

good, moderate, less and less so. To determine the categories, the data must first be collected and counted then categorized according to the norms of categorization.

**Table 3. Frequency Distribution Capabilities to Implement the Physical Education Teacher Education Out of School Activities.**

No	Interval	Kategori	Frequensi	Percentage
1	82.19 - >	Excellent	3	8,57%
2	76.81 - 82.18	Good	11	31,43%
3	71.43 - 76.80	Medium	11	31,43%
4	66.05 - 71.42	Less	8	22,86%
5	66.04 - <	less so	2	5,71%
Total			35	100%

Based on the above table, it is known that the ability of Physical Education Teachers in Implementing School Outdoor Learning in Physical Education Teacher Se-District of Kebumen, 2 teachers in the category of less than once with a percentage of 5.71%, 8 teachers in the category of less with percentage of 22.86%, 11 teachers in the category of being with a percentage of 31.43%, 11 teachers in either category with a percentage of 31.43% and 3 teacher in the category very well with a percentage of 8.57%,



**Figure 1. Ability of Physical Education Teachers in Implementing School Outdoor Learning in Physical Education Teacher District of Kebumen Kebumen**

Based on the results of the study showed that the ability of Physical Education Teachers in Implementing School Outdoor Learning in Physical Education Teacher Se-District of Kebumen, 2 teachers in the category of less than once with a percentage of 5.71%, 8 less teachers in the category with a percentage of 22.86%, 11 teachers in the category of being with a percentage of 31.43%, 11 teachers in either category with a percentage of 31.43% and 1 teacher in the category very well with a percentage of 8.57%. It can be concluded that the ability of Physical Education Teachers in Implementing School Outdoor Learning in Physical Education Teacher Se-District of Kebumen Kebumen in the category of medium and good. Acquisition of the above results, due to several factors that affect the physical education teachers, among others, as follows:

- 1) Factors that comes from within each individual or PE teacher (intern), which consists of physical and psychological factors.
- 2) The factor that comes from the outside in each individual or PE teacher (external), which includes: the student, the school environment, equipment and learning materials outside of school activities (curriculum).



Learning is a curriculum that requires the activity of actualization of teachers in creating and growing activities of learners in accordance with the plan that has been programmed. The teacher must master the principles of learning, selection and use of instructional media, the selection and use of teaching methods, assessing skills Results of study of students, as well as sorting and learning to use the strategy or approach. Matter is the substance of the learning process of physical education. Provision of material in physical education depends on the choice of physical activity, so the selection of physical activity will affect the learning process. This material contains the tasks of motion or physical activity that is planned to be implemented by the learner, through experiential learning that is expected to change. Learning objectives contain expectations about the expected behavioral changes in self-learners. This goal will color or affect the learning process of physical education, so that this goal is the starting point of the whole learning process physically.

## CONCLUSION AND SUGGESTION

Research shows 11 teachers in the category of being with a percentage of 31.43%, 11 teachers in either category with a percentage of 31.43%. Learning outside the classroom is through the activity of interdisciplinary learning through a series of activities designed to be done outside the classroom. This approach is consciously exploiting the potential of natural background to contribute to the physical and mental development. By increasing awareness of the reciprocal relationship with nature, the program can change attitudes and behavior towards nature. Learning is a curriculum that requires the activity of actualization of teachers in creating and growing activities of learners in accordance with the plans that have been programmed.

Lessons are taught physical education in schools targeted towards the harmony between body growth and mental development and is an attempt to make the Indonesian nation to be a nation of healthy, strong and unseen, and can be given to all types and levels of schooling. Physical education is a learning process that is designed to improve physical fitness, develop motor skills, knowledge and active living behaviors and sportsmanship through physical activity. The teacher must master the principles of learning, selection and use of instructional media, the selection and use of teaching methods, assessing skills Results of study of students, as well as sorting and learning to use the strategy or approach.

## REFERENCES

- Arma Abdoellah & Agus Manadji.(1994). *Dasar-dasar Pendidikan Jasmani*. Departemen Pendidikan dan Kebudayaan.
- <http://blog.uny.ac.id>. (2010) Hari Yulianto. *Aktivitas Luar Sekolah*. access on 19 Januari 2011 pukul 20.21 WIB.
- Mulyasa. (2005). *Kurikulum Berbasis Kompetensi*. Bandung: PT. Remaja Rosdakarya
- Rusli Lutan.(2000).*Mengajar Pendidikan Jasmani*. Jakarta. Depdiknas.
- Suharsimi Arikunto. (1993). *Prosedur Penelitian Suatu Pendekatan Praktek*. Jakarta: PT. Rineka Cipta.
- Sugiyono, (2002). *Statistika untuk Penelitian*. Bandung: CV Alfabeta
- Thomas K.T., Lee A.M., Thomas J.R. (2003). *Physical Education Methods for Elementary Teachers*. Champaign, IL. Human Kinetics.

# DESIGNING PHYSICAL EDUCATION (PE) LEARNING USING SCIENTIFIC APPROACH

Aris Priyanto

Sport and Youth Department Yogyakarta, Indonesia  
aris\_smasiji@yahoo.com

## Abstract

Curriculum, as stipulated in Law Number 20 Year 2003 about National Education System, is a set of plans and management regarding the purpose, content, teaching materials and methods used by learning organization to achieve specific educational goals. Curriculum is dynamic and always requires change and renewal in order to meet the internal and external demands and challenges. How to arrange the most ideal curriculum for Physical Education (PE) subject is not easy to answer. Because, in the end, curriculum is the result of agreement among various stakeholders, including policy makers, education experts, and practitioners e.g. core teachers, instructors, superintendents, and teachers in general. Based on Regulation of Education Minister Number 69 Year 2013 about Curriculum Framework and Structure for Junior High School, Physical Education (PE) Subject is included in Group B, as mandatory subject, with time allocation 3 (three) hours per week in class X, XI, and XII. In implementing Curriculum 2013, it is expected that teachers use scientific approach in the learning process as stated in Regulation of Education Minister Number 65 Year 2013 about the Process Standard. Consequently, teachers have to be creative in designing a good planning that can be implemented well in order to enhance efficiency and effectiveness of the achievement of graduation competence.

**Keywords:** *Curriculum 2013, Physical Education (PE) learning, scientific approach, planning*

## INTRODUCTION

One of the most difficult challenges for education in this globalization era is how to prepare Indonesian people to be intelligent, excellent, and competitive. Having intelligent, excellent, and competitive human resources, we will be able to make partnership and compete at a global level.

Ministry of National Education has launched curriculum 2013 in the academic year 2013/2014, started on Monday July 15, 2013. This curriculum has been implemented at limited number of pilot schools. It is expected that all elementary schools (SD), junior high schools (SMP), senior high schools (SMA) or vocational schools (SMK) be ready to do so in the academic year 2014/2015. It means that the old program must be completed until the academic year 2015/2016. Based on the Circular Letter of the Minister of Education and Culture No.156928/MPK.A/KR2013 dated 8 November 2013 about the implementation of Curriculum 2013 that in the academic year 2014/2015, together with the Ministry of Religious Affairs will implement the curriculum at all educational units in 2013: Elementary School at class I, II, IV, V. Junior High School at class: VII, VIII, and Senior High School at X, XI throughout Indonesia.

Promoting competence of Physical Education (PE) teachers at Junior High School Senior High School about learning based on curriculum in 2013 includes: changing of mindset, understanding and an open attitude towards the interpretation of the curriculum in 2013, the analysis and development of teaching materials, the understanding and practice of

creating lesson plans and its implementation by using scientific approach and a variety of learning models, as well as an understanding and practice of authentic assessment.

Teachers have a very important and strategic role in guiding, directing, and educating students. Their roles are so important that teachers' position is not replaceable by anyone or anything, including advanced technology. Consequently, teacher must obtain the widest opportunity to develop professionalism and be dignified to prepare excellent and competitive human resources. With the implementation of the curriculum 2013, teachers are required to improve their competence to be successful in creating effective learning using the scientific approach and authentic assessment.

### **THE BACKGROUND OF CURRICULUM 2013**

Organizing education as mandated by the Act No. 20 Year 2003 on National Education System is expected to realize the developing of the students' personal qualities as the future generation. It is believed that students as future generation are determinant factor for the growth of the nation and the state of Indonesia.

Curriculum is one of important educational elements that make a significant contribution to the development process of realizing the potential quality of the learners. So there is no doubt that a well-developed curriculum based on competence is significant as an instrument to direct learners to be: (1) qualified human being that is able to proactively respond to the challenges and ever-changing of era, and (2) an educated person who is faithful and obedient to Almighty God, having good behavior, healthy, knowledgeable, skilled, creative, independent, and (3) democratic and responsible citizens.

Curriculum as defined in Article 1 paragraph (19) of Law No. 20 of 2003 is a set of plans and management regarding the purpose, content, and teaching materials and methods used to guide the organization of learning activities to achieve certain educational goal. Curriculum 2013 development is the follow up Competency Based Curriculum Development that has been initiated in 2004 and 2006, which includes attitudes, knowledge, and skills in an integrated manner. Curriculum 2013, which put into effect from the academic year 2013/2014 meets the second dimension.

The rationale of curriculum 2013 development was based on internal factors related with the educational conditions associated with the demands of education, which refers to the eight (8) National Education Standards namely: content, process, graduation competency, educators and education personnel, facilities and infrastructure, management, finance, and educational assessment. Other internal challenge is how to transform from productive human resources into competent human resources through education and skills so they don't be a burden. External challenges related to future challenges, competencies needed in the future, public perception, the development of knowledge and pedagogy, as well as various negative phenomena which arise.

### **CURRICULUM STRUCTURE OF SENIOR HIGH SCHOOL AND VOCATIONAL SCHOOL (SMA/MA/SMK/MAK)**

Curriculum Structure consists of Group A, B, and C. Group A and B are compulsory subjects that must be followed by all learners, Group C consists of specialization subjects which are followed by learners according to their talents, interests, and abilities. This grouping is intended to implement the principle of equality between High School and Vocational School. There are 9 (nine) compulsory subjects with time allocation 24 hours per week. Groups of specialization subjects for SMA / MA consists of 18 hours per week at class X, and 20 hours per week at class XI and XII. Groups of specialization subjects SMK / MAK 24 hours each per class. Groups of specialization subjects SMA / MA has characteristic as academic subject, while at the SMK / MAK is vocational. This structure puts the principle

that learners are the subjects in the study and they have the right to choose according to their interests.

Table 1: The curriculum 2013 framework based on Regulation of Education Minister Number 69 Year 2013 for Senior High School (SMA/MA and SMK/MAK)

Subject		Time Allocation per week		
		X	XI	XII
<b>Group A (Compulsory)</b>				
1	Religious and Moral Education	3	3	3
2	Pancasila and Citizenship Education	2	2	2
3	Indonesian Language	4	4	4
4	Mathematics	4	4	4
5	Indonesian History	2	2	2
6	English Language	2	2	2
<b>Group B (Compulsory)</b>				
7	Culture and Art	2	2	2
8	Physical Education	3	3	3
9	Handy craft and Entrepreneurship	2	2	2
Time Allocation Group A and B		24	24	24
<b>Group C (Specialization)</b>				
Academic Specialization (SMA /MA)		18	20	20
Vocational Specialization (SMK /MAK)		24	24	24
Time allocation per week for SMA/MA		42	44	44
Time allocation per week for SMK/MAK		48	48	48
Total time allocation (SMA/MA/SMK/MAK)		48	48	48

## PE TEACHER TASK ANALYSIS

The uniqueness of PE teacher task lies in the mission he carried to achieve the comprehensive goals of education. Although the occurrence of learning process is characterized by a variety of physical activities as a learning experience, the whole educational scene, also focused on improving the ability of reasoning and the development of personality traits, according to the characteristics of the curriculum 2013 approach.

Tousignant and Siedentop (1982) classify tasks performed by PE teachers into 1) managerial tasks, including checking the presence and completeness of clothing. 2) instructional tasks that focus on the transition phase, organizing groups, and placement and setting equipment. PE teacher duties to achieve a satisfactory level of teaching effectiveness includes several dimensions of management: 1) teaching management tasks, 2) behavior management, and 3) management of time and equipment. PE teacher has role as planners, managers, colleagues, professional physical education, counselor (guidance counselor), and a representative of the school (Siedentop, Herkowitz, and Rink, 1984).

Being a PE teacher is more complicated than that of other subject. As a learning experience that is packed in the curriculum, PE is more complicated for several reasons. *First*, the objectives are comprehensive, as not only to improve the physical aspect with some relevant elements but also to stimulate the growth and development of organs. *Second*, the achievement of the intended goals depend on the tasks of teaching, which in this case, in the form of physical activity in the form of play or sport activities. *Third*, how teaching methods to deliver teaching duties as a stimulus for around growth also contributed to the achievement of educational goals. *Fourth*, environmental factors include physical aspects, such as sports facilities and infrastructure determine how teaching and learning activities take place. *Fifth*, factors and learning atmosphere, which is reflected in the psychological atmosphere of emotional reaction to all school personnel, including teachers and students .

To achieve these objectives, the key lies in the competence of teachers to manage learning including several management: tasks of teaching, student behavior, tools and sporting facilities, administration, and time.

## **SCIENTIFIC APPROACH IN LEARNING BASED ON PERMENDIKBUD RI NOMOR 65 TAHUN 2013**

### **The Essence Scientific Approach**

Learning process can be regarded as a scientific process. Therefore, Curriculum 2013 mandates a scientific approach to be used in learning. The scientific approach is believed to be the golden bridge in the development of attitudes, skills, and knowledge of learners. In the approach or process that meets the criteria of scientific work, it emphasizes inductive reasoning (inductive reasoning) rather than deductive reasoning (deductive reasoning). Deductive reasoning is a common phenomenon to see and then draw specific conclusions. Instead, look at the phenomenon of inductive reasoning or specific situations then draw conclusions as a whole. Indeed, inductive reasoning put specific evidence in relation to the broader idea. The scientific method generally puts a unique phenomenon with specific and detailed study then formulate general conclusions.

Scientific method refers to investigation techniques towards some phenomenon or symptoms, acquiring new knowledge, or correcting and integrating previous knowledge. To be called scientific, the searching method (method of inquiry) should be based on evidence of the object that is observable, empirical and measurable with the principles of the specific reasoning. Therefore, the scientific method includes a series of data collection activities through observation and experimentation, information or data processing, analyzing, and then formulating and hypotheses examination.

### **Learning Steps Using Scientific Approach**

The learning process of the curriculum in 2013 to be implemented at all levels by using a scientific approach. The learning process should determine three domains, namely attitudes, cognitive/knowledge, and skills. In the learning process based on a scientific approach, the attitude domain refers to learning material that lead students to know ‘**why**’.

Skill domain refers to the transformation of material substance to lead the students to know ‘**how**’. Cognitive domain refers to the question about ‘**what**’. The final result is the improvement of balance between the ability to be a good man (soft skills) and people who have the skills and knowledge to live a decent live (hard skills) that includes attitudes, skills, and knowledge aspects .

Curriculum 2013 emphasizes modern pedagogical dimension in learning, using a scientific approach. Scientific approach includes digging information through observation, questioning, experimentation, and then processing the data or information, delivering data or information, followed by analyzing, reasoning, drawing conclusion, and creating.

*The application of a scientific approach in PE learning*

The step of scientific approach in PE learning can be explained as follows:

1. **Observing;** Observing means that students are invited to see, either watch the audio-visual or through movements practiced or demonstrated by the teacher. It is intended to explore the thinking of learners, the extent to which early mastery of the material they have. These observations will determine the following step done by the teachers. Observing could be done by viewing such visual or documentary video if the schools have adequate facilities . But for teachers or schools that do not have audio-visual means of support, observing can be done by looking at the display, by direct observation in the neighborhood, to invite students to look outside the school environment , for example observing people's activity in everyday activities or look at animal behavior . Observations in this learning material must be in accordance with the material or the purpose of learning, so teachers must be good or be selective in choosing the material . For example, in the learning material about under passing in volleyball , then video, images, or caption to be provided should be identical to the good volleyball game, whether it is real or modified game. In addition to observing video learning or observing human activities , a teacher can give examples of images both photos and illustrations , which is associated with learning materials to be delivered . After observing video, images or caption, learners are given the opportunity to give opinion, or a review the new things they have observed. Teachers should provide opportunities as much as possible to students. With this step the teacher is expected to be able to summarize the opinions and provide conclusions, so the teacher will easily design the next learning step .
2. **Questioning;** After all students doing observation, the next step is questioning about under passing material. This activity is to facilitate the students to get to know about the meaning of a movement/motion or basic technique the material submitted. It is expected that questioning happens interactively from both sides, teachers give opportunity for learners to ask, and at the same occasion the teacher should respond question from the students clearly. The next turn, the teacher give questions to students. It is intended that teachers know how far the students' knowledge so that teachers will easily design the next learning steps.
3. **Experimenting;** in this step, learners are given the opportunity to practise a movement/action based on the observations they have done. In the process of experimenting the teacher should provide an opportunity for all learners to practice a movement skills as much as possible. The role of teacher is observing every movement that learners performed in accordance with the video. The important thing is all the students dare to try to practice as much as possible without looking right or wrong the movement they perform. The goal is to have all students experience a lot of movement.

In PE learning, the experimenting step is an obligation. This phase gives teachers the freedom for the students to practice what they get from the previous learning step, ie observing, questioning and discussion. One of the materials that will be studied is a big game - under passing volleyball. Passing in a volleyball game is an effort of volleyball player by using a certain technique that aims to turn over the ball to his friend. The basic element of a good under passing is: (a) to move to take the ball, (b) to set the right position, (c) to hit the ball, (d) to direct the ball towards the target.

To be able to perform basic technic of under passing, students must first be able to understand and know the basic techniques that are in accordance with the material since there are a lot of techniques that must be done starting from sight, body position, foot position, hand position up to the follow throw. With the only technique of under

passing with many kinds of techniques, the practice step should have bigger portion. For example, the percentage between explanation and practice can be said to be 20% versus 80%.

Here is an example of the implementation of the under passing in volley ball : 1) Marching, praying, presence, and apperception; 2) Motivate and explain the purpose of learning; 3) Warming by playing and catching large balls as well as static and dynamic stretching; 4) Under passing basic techniques above means performing under passing begins with bouncing ball to friends and after bouncing on the floor the ball is driven with two arms (individual). Perform under passing the ball bounced in place followed friends while walking forward and sideways motion of the right and left (individual). Perform under passing directly in pairs, in groups, forming a circle formation, or in a line. Doing under passing by pushing the ball, bouncing the ball on the spot, catching while walking forward (individual). Doing under passing begin with bouncing the ball on the spot after the ball bouncing on the floor, it is driven by two arms (individual). Doing under passing while walking right and left in lateral movement (individual).

With the above example the role of a teacher is not dominant, but only to observing and taking notes about what is lacking and must be corrected, or giving appreciation for students who are able to perform in accordance with the right techniques and will be implemented by the teacher at the end of the lesson.

4. **Processing**; After the students try to do movement skill, the next step is to repeat the movement skill, especially in parts of movement skills that have not been mastered. Learners should pay attention to the correct step of motion in accordance with what has been on display in the observation step.
5. **Presenting**; At this stage, learners are given the opportunity by the teacher to present the results of movement skills they do in the previous step. Here the teacher must pay attention to all steps of the movement made by the students during the presentation.
6. **Reasoning**; in general it is a process of thinking logically and systematically over the empirical facts that can be observed to obtain a conclusion in the form of knowledge. Reasoning can be meaningful resemblance (associating) and can also significantly effect (reasoning). Reasoning could be implemented with a variety of methods including discussion. With discussion it will be many opinions expressed by learners with a wide variety of reasons. The position of a teacher in this step is only as a mediator until all opinions can be expressed. The next step is the teacher concludes from a wide variety of opinions from students. At this step, learners are already able to understand the steps of movement that should be done in accordance with the correct movement pattern.
7. **Creating**; after the students understand the correct movement patterns that must be done in a movement skill, the students are expected to make practice as much as possible in accordance with the correct pattern of movement. It is possible for them at this step to do variations and combinations of motion techniques.

## CONCLUSION

With the implementation of Curriculum 2013, Physical Education (PE) teachers are required to improve their competence in order to be able to create an ideal learning. In this case, teacher should master how to implement scientific approach and authentic assessment.

PE teachers play an important role in educating the whole child as planners, managers, colleagues, professional physical education, counselor (guidance counselor), and a representative of the school, consequently they should work hard to be more professional. Curriculum 2013 emphasizes on pedagogical dimensions in learning, using a scientific

approach, covering gather information through observing, questioning, experimenting, and then data or information processing, presenting data or information, followed by analyzing, reasoning, then making conclusion, and the last is creating.

## REFERENCE

Oemar Hamalik. (2003). *Proses Belajar Mengajar*. Jakarta: PT. Bumi Aksara.

Permendikbud RI Nomor 65 Tahun 2013 *Tentang Standar Proses Pendidikan Dasar Dan Menengah*.

Permendikbud Nomor 69 Tahun 2013, *Tentang Kerangka Dasar Dan Struktur Kurikulum SMA/MA*.

Saud, Udin Saefudin, (2009), *Pengembangan Profesi Guru*. Bandung: CV. Alfabeta.

Sukmadinata, Nana Syaodih, 2009. *Pengembangan Kurikulum, Teori dan Praktik*. Bandung: PT. Remaja Rosda Karya.



# **A COMPARATIVE STUDY ON SPORT EDUCATION CONCEPT AND MOVEMENT EDUCATION CONCEPT IN PHYSICAL EDUCATION TEACHER EDUCATION: AN OVER VIEW ON EXISTENCIAL PHENOMENOLOGY**

**Bambang Abduldjabar**

**Indonesia University of Education, Indonesia**

## **Abstract**

Physical Education Teacher Education in Indonesia that is comprised into 13 Sport Higher Educational Institutions had been developed into Sports Concept. On the other hand, Christian Academics Lichamelijke Opvoeding (Calo) Windesheim University the Netherlands had been developing movement education concept for almost 24 years. A comparative study was conducted in terms of both of their own curriculum, teaching about teaching, learning how to teach, and the strengths and weaknesses among each other. The future direction is also outline to fulfill students and society needs regarding the needs of having a good quality of life through socialization of movement among Indonesian people.

**Keywords:** *sports concept, movement education concept, curriculum, teaching about teaching, learning how to teach, and critical constructive movement socialization concept*

## **INTRODUCTION**

Due to the history of Indonesia and Netherland, both of the countries have strength connection in political, economical, and educational systems. Moreover, in 2003, Bart Crum as one expert of Physical Education Teacher Education (PETE) from Vree University the Netherlands came to the School of Physical Education and Health Education (SPEHE) in Indonesia to attend the International Seminar and shared the Human Movement Concept. In 2006, by conducting a clinic on Didactic Course in Teaching Games which the instructors from the Christian Academic Lichamelijke Ofvoeding (CALO), the Netherlands gave a lesson to the all SPEHE colleges also influenced the main idea of teaching student teachers of PETE. In 2009-2011, three teachers and 16 CALO students came to the SPEHE periodically to conduct a project of Movement and Sport for Disabled Students which was provided by the Ministry of Education of Netherlands and the Dutch Embassy in Jakarta, the School of Physical Education and Health Education was influenced by the idea of movement education concept.

In 1956 Indonesian Government built Governement of Instituut for Lichamelijke Opvoeding (GIVLO). The Institution was influenced by the concept of movement, as seen in some subject were put on the curriculum are anthropology, typology, specific psychology, and teaching technique. The core of the curriculum was the concept of movement related to health. Because, then, In SPEHE Government attached the school within a medical faculty, so it is very closed to movement for being healthy. But, since 1960s, and just because of the world of “olahraga” (Indonesia Language) which is very close to the world of sport, the concept of movement changed into “olahraga,” and then in SPEHE, it was well known as the subject of sport for health. The word physical education which was published in the era of GIVLO dramatically turned into sport for health within the subjects of Indonesian school’s curriculum.

In 1973, Indonesian Government developed The School of Sport Higher Educational Institution. The school developed the term of “olahraga” in the context of sport for health and recreation, sport for education, and sport for high skills performance, which were well known as its department. Nevertheless, it is influenced by the word of sport within American context

as achievement of high skills performance, the existence of sport within the Indonesian schools became sport concept. But the fact, in teaching physical education teacher in almost all Indonesian schools as sport trainer behavior, they drill or train their students to be able to do sport technically. Sport in schools context had been interpreted as sport for high skill performance.

Since 1994 until now (2013), The Educational Ministry of Indonesian Government made a policy to make it altogether become physical education, sport and health. The subject within Indonesian schools had three meanings. *First, education through the physical activity* as the real concept of physical education. The physical education teacher has to teach the students through movement or physical activity to get a good personal character, to develops students 'attitude and good behavior socially, and to develops students cognitively. *Second, education of or about the physical* which is related to training of the physical, it seems the concept looks like a training of the physical or sport. This meaning relates to idea of sport concept within American context. *Third, education of health*, it is also mean education through movement or physical activity. The student was carry out to do movement or physical activity or even sport, Indonesia government want the students to get a health body condition. The students can stand by their own body and shown a healthy life style. These three meanings that has its own goal seems too much objectives.

The third goal; however, leads to the unclear meanings of learning process of physical education within Indonesian schools. Indonesia has to prove that teaching physical education is a tool to reach Indonesian Education Goals (Rusli Lutan, 2004:72). It also leads to be kind of empty meaning as the subject in the core of Indonesia school curriculum. Adang Suherman stated as a need to be revitalize of physical education (2006) and there is a gap between physical education's curriculum as a guide in education proses and the reality of learning process in teaching physical education at school (2013:29).

Its objectives in conducting physical education within Indonesian school bring to a misleading concept of physical education philosophically and pedagogically. The misleading of philosophically means that physical education as an idea to educate the pupils through the physical to be literate in physical becomes pupils who literates in sport skills. The misleading of pedagogically means that physical education within Indonesian schools tends to have scarcity in student learning process. The idea of training sport skills to be a sport performer was tend to the learning is a tool rather than as a goal.

PETE as educational institution should reflect the teaching-learning process rather than training sport technique learning process. The term of students learning should be put in the center of movement education process. The education environment should in a structure that movement task, time, student movement capability, and equipments in the development of student learning cognitively, affectively, and socially. Physical education teacher should carry out the students to understand about movement, body, and relation between the body and movement to come to their world. Physical education is not sport. Physical education is an education concept; meanwhile, sport is rather high skills performance that needs training, drilling, and exercising to master and to have skill of sport technique acquisition concept.

Sharon (1990) stated that conceptual orientation in teacher preparation are (1) academic; (2) practical; (3) technological; (4) personal; and (5) critical/sosial. Crum (1991), PETE should relevance with the definition of physical education within schools, to enhance the quality of physical education on school's curriculum and research in teaching physical education. Moreover, defining a clear concept of physical education, especially to make definite contribution to educational area, should consider the essence of movement and body and social needs regarding student as human being. PETE should as educational institution which is very close to fulfill the needs of student and society.

Garret and Fiengold (1985:285) curricular phases of PETE within a concurrent approach should be in the form: 1) orientation to physical education; 2) study in the Discipline (Theory) of physical education and substantive teaching; (3) generic teaching and internship; (4) professional teaching. PETE is an educational institution rather than sport higher institution. PETE in SPEHE was moved from educational institution into sport higher institution whose goals are to literate student physically, sport good performers, and healthy students. This condition leads to multiple purpose education concept. This concept made the unclear objectives or too much objectives which the result unclear student learning process meaningfully, purposefully, and contextually.

The misleading in conducting physical education and at education student teacher at PETE in SPEHE philosophically and didactically need a comparative study. The study relies on the context of (1) curriculum of PETE (2) teaching about teaching of teacher educator (3) learning how to teacher within student teacher (4) the strengths and the weaknesses of both concept (5) future direction of physical education in SPEHE. To answer those entire questions can be answered by making a comparative study with the movement education concept that was developed by Christian Academics for Lichamelijke Opvoeding (CALO) Windeshiem University the Netherlands. These activities inspire to conduct a comparative study in the both education system of PETE. The study will be started by giving a story of the SPEHE development. Now, let's go the comparative study that will introduce first of the PETE system within SPEHE of Indonesia country.

### **PHYSICAL EDUCATION TEACHER EDUCATION (PETE) IN THE POINT OF VIEW OF THE SCHOOL OF PHYSICAL EDUCATION AND HEALTH EDUCATION—IN SPEHE UNIVERSITY OF EDUCATION**

Teaching physical education at schools is a reflection of physical education teacher education in Higher Educational Institution. The competencies of being professional in teaching physical education should be planted by the PETE in Higher Educational Institution. The competencies that developed in PETE should suitable with the school needs and society needs. The school was developed into three main streams areas, such as (1) the stream to be physical education teachers or sport teachers; (2) the stream to be instructor in sport for health and recreation; and (3) the stream to be sport coaches. Nevertheless, in all over role function, PETE in SPEHE can be means preparing the students to be a physical education teacher, sport for health and recreation instructor, and also coaches of sport for high skills performance. Three kinds of different graduate of students were blend together to become physical education teacher at elementary or secondary schools. The person who has role in teaching physical education at school has a function of being coaches, instructor, and also educator of or through movement, games or play, even sport performance.

Teaching physical education within Indonesian school, practically, tends to be sport drill concept with the tendency to be kind of sport socialization concept, which the end of the program is the student has to be able to do sport, and becomes an athletes or better sport performers. Due to the goal is to be an athlete, that supposed as a tool to promote the school biocratically, and student's learning is a tool for being a good sport performers, leads to be empty meaning for the learning of movement or even learning through movement. The empty learning process is also a matter in phylosophically. Education into movement becomes education into sport. The goal to educate the student to be literate physically will become literates sportly. These caused the PETE in SPEHE is on the dilemma in conducting program between, namely, to be educational institution or sport higher institution. The didactical process seems to be a training or exercising the students to have a lot of sport task technically. Habituating the student into sport technique concept is in common than educating the students through or into movement.

The teaching learning process of PETE in SPEHE is more likely to be training process. The student's learning process appears to be a tool to have the student be able to do sport. The student teacher is lack in capability of being professional in teaching, due to the combination between of being good in sport performer and teaching performer. Students and teachers have scarcity in teaching practically and internship. The student teacher has only one semester internship in primary or secondary school, and was not so much known in learning about school environment, sport school facilities, and sport school equipment. The curriculum, academically, tend to both good in sport training and good in teaching of sport. The role of teacher educator is being sport trainer, which is lack in term of didactics and methodics of teaching practically. In further conception, it was also lack in enhancing to be professional in teaching physical education.

### **PETE IN THE POINT OF VIEW OF CALO WINDESHEIM UNIVERSITY**

Before I continue in discussing that PETE should be transformed to In SPEHE situation, I would like to gland the overview of PETE in the form of CALO Windesheim University. PETE in CALO had been developed into movement education concept. The concept was structured by social constructivism in teaching practical, that is called internship or "stage," which was shaped by didactics practical theory and supported by many lesson or subjects within CALO Curriculum to fulfill the standard of physical education teacher competencies.

The movement education concept was chosen as a very basic content in teaching physical education at schools. Movement is a general term, it is a very huge phenomenon, and was interpretive as an umbrella within enhancing good qualification of physical education's role in core of schools' curriculum. Movement was argued as a bridge to make connection between the body and the world. Moreover, philosophically, movement is the way to make a dialogue or relational way within the displacement of body into the world. Movement is not only a body phenomena but also it is a soul, that being melt together as a person, to come to their world. On the other hand, sport, even it is a human movement phenomena, but it is always related to a person whose very skilled and talented in the way to performed its. It is not all pupils can performed its. It always just limited pupils who can perform it. The first priority content in teaching physical education at schools must be movement, and then sport is the second place.

Movement education concept is education into movement. The process of education tends to want the pupils being capable in movement. It is kind of planting movement that supposed the pupils understand their body comes to their world. They can celebrate that they have their body. They knew well the essence of movement to impact their body. They maintain their body through movement. They go being physically active life style. They understand that the body and movement is the way to have a good quality of life. Teaching physical education is always related to be a physically educated persons rather than sportly educated persons. Teaching physical education is a kind of the way to teach the students to be literate physically.

Movement is not always sport. In most of European countries sport was facilitated by society in a sport club. Movement is always connected to physical education at school, on the other hand, sport is always related to society. In Europe countries, the subject on the schools' curriculum that related to movement and body is physical education. The name of the subject on their curriculum is only physical education. They didn't mix it together as the name of physical education, sport and health.

Movement education concept that was developed by CALO Windesheim University, since the beginning of the student's year was introduced in a form of internship. The first year of CALO students has to come to the schools, in a form of group, and should learn and watch the teaching learning process of physical education at the school. In the second year of CALO

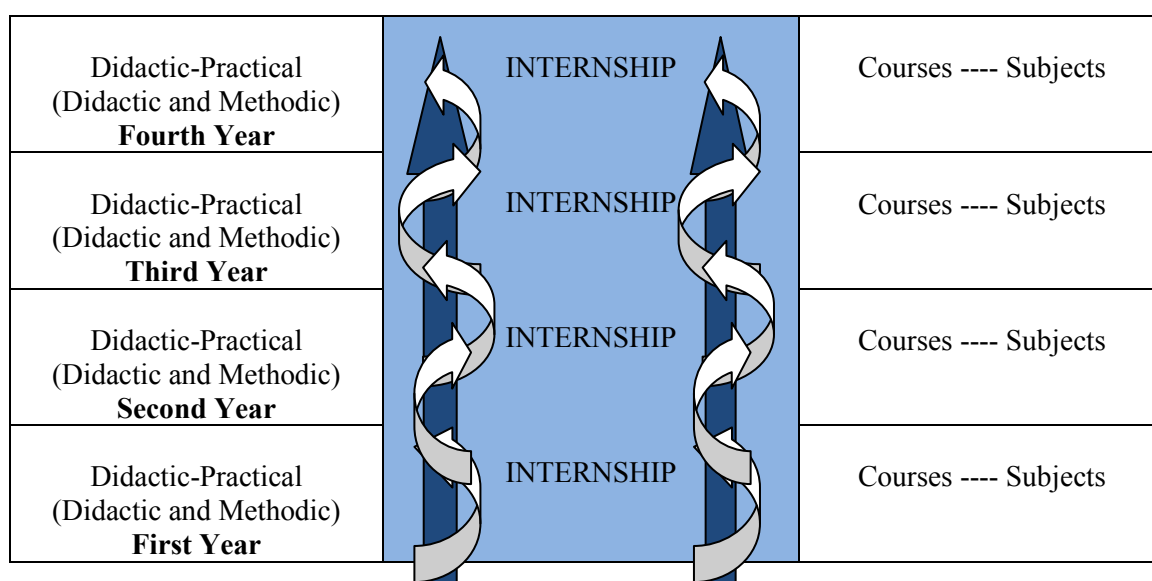
students has to make internship one day in a week to observe and assist physical education teacher at the school. On the next year, at the third year, the student has to come to the school two days in a week. They have to teach and assist the physical education teacher. At the fourth year of CALO students, they have to make internship three days in a week. Mostly the students of CALO assist the physical education teacher as a volunteer. As long as the CALO students make internship, they will also guide and watch by the lecturer of CALO. The students and CALO's Lecturer should constructively develop the physical education teacher's competencies. This kind of way of thinking in making physical education teacher professional as likes a "burning iron" knocks by the hammer to become a shape sword.

The concept of movement education is also supported by didactics practical that is done by the teacher to strengthen the qualification and competencies of being physical education teacher. The students in almost every lesson should applied the didactical process among others students of the class. They should learn in the frame of learning how to teach. The internship which is started since the first year of CALO student will always supported by didactics practical concept. The students and teacher construct the meaningfully teaching-learning process in the form as "spiral dynamic" among the concept and didactics practical in teaching physical education. The synchronization between the students to learn how to teach and the teacher teaching about teaching will enhances the qualification and competencies one and another.

PETE in CALO is using movement whether as an object or as a subject, in the meaning of learning to move or moving to learn. It will always close with didactically and methodically way. The CALO students should also learn about organization of movement task, learning equipment, time, space, and student capability in effective education environment. Others consideration should put on designing movement task, presenting movement task, how to make it easier and difficult, mapping the movement task, and scaffolding the movement task which can be learning environment meaningful and contextual to the students needs and society needs.

Movement was transformed into game situation. And then, it even likes sport skills activities, movement that attached on sport skills was also transformed to be a game likes sport. Movement and game likes sport were used as a process of learning by applying pedagogical constructivism approach. Didactically and methodically process of learning has been developed into movement education concept. The teacher was equipped by the concept of teaching about teaching and the student should be skilled in learning how to teach. These concepts will be a focus in doing this comparative study. In almost of every lesson that should be taken by the student was delivered by didactical approach.

The interlink between didactics-practical and courses—subjects strengthened the internship process (Figure 1). The process is a kind of connecting the theoretical didactic on one side and practical in another side. The result of the forth and back concept shaped the qualification and competencies in being professional physical education teacher. Didactic-practical that began since the first year of student teacher and courses or subject in related to constructivism pedagogy that applied the concept reflective teaching in internship and giving a lesson construct the competencies of being physical education teachers.



**Figure 1.**  
**The interlink between didactics practical and courses—subjects  
to shaped the internship**

#### **COMPARATIVE STUDY IN CURRICULUM OF PETE**

In the concept of CALO, movement was interpreted as human phenomena. Movement is not a body sign or the result of muscles contraction, but as a wholeness of the phenomena of the body, mind, and soul. According to existential phenomenology, movement is human phenomena. Movement is a symbol of human. It is the sign of experiencing to understand themselves. In the context of phenomenology psychology, movement is also stated as human phenomena as a symbol of consciousness of being embodiment to his/her self.

In the view of education, movements will always grow continuously. This is a sign that movement need to be taught to the students. Movement should be learned by the students to be skillful in movement capabilities for having good quality of life. Movement was studied and developed to fulfill everything that students need in life and society needs. Movement is a bridge to understand their world. Because of movement that attached to their body, they can understand their movement identity, they understand their environment and they own their world. Movement education concept can deliver the students to be embodiment. They can stand by their own foot and wealth. They have their own movement identity. They can continue it into being active life style and to be fit in their daily life.

The importance of movement in teaching physical education will always relate to the human body, and moreover, if talking about the body, there will be connection to our human dignity as a person. The role of physical education in schools curriculum and as a subject should always enhance the existence of the body through movement or physical activity. According to existential phenomenology theory, body is a phenomenon that exists to communicate to the world. There is a dialogue between human dignity and the world through movement of the body.

Movement education concept, which was developed by CALO, stresses on the constructivism pedagogy. The teacher and student makes a meaningfully, purposefully, and contextually constructivistics communication through and into teaching movement. Socialization of movement is strengthened by making structured of constructivist teaching learning environment. The teacher creates the learning environment that shown the students' learning in the center of movement education. By making teaching plan, include designing

movement task, and then presenting the movement task into consideration of student's capability, space, time, and equipment that cover by taking into account of giving student movement problem task, then in the last session of teaching makes reflection... can be a sequence of teaching learning movement concept that can carry out to have students understand their body and their movement.

On the other hand, PETE in the School of Physical Education and Health Education that stress on sport concept was grounded by the idea of sport performer. It can be develops by habituating, drilling, practicing, exercising, and coaching. This kind of methods brings the students to master sport skills technique. The goal that must be reached is the student can be as a good performer in doing sport skills technique, and in the future of time, the students can be as an athlete to have sport achievement in competing to others. The concept within this phenomenon is forcing the students to be able to do sport. The student should be able to adapt to sport skills technique rather than sports adapt to the student movement capabilities. The process of teaching learning is tend to be the student get empty meaning, that could be also comes to the condition of zero learning.

The basic philosophy, study object, and conceptually teaching learning process in both PETE institution can be describe into Table 1.

**Table 1. The comparative study in the major of Curriculum**

Category	Curriculum PETE in CALO	Curriculum PETE in The School of Physical Education and Health Education
Basic Philosophy	Existential Phenomenology; Phenomenology Psychology; Ecology Psychology;	Sport Performers
Object Study	Human Movement Studies Movement—game situation	Sport Sciences
Concept in PETE	Movement Education	Sports Skills
Core of concept	Pedagogical and didactical approach	Training concept approach

## COMPARATIVE STUDY IN TEACHING ABOUT TEACHING

The ideas of movement education concept and sport skills concept come to be compared in teaching about teaching in both PETE institutions. This idea seems to compare between Higher Education Institution and Sport Higher Institution. This point of view can be seen by looking to teacher behavior, teacher-students interaction, and the goal that should be reached. On the CALO concept is close too much to educational concept, that can be seen by (1) didactics and methodic applied by the most of CALO teachers; (2) strongly connection between didactics-practical and curriculum of CALO in shaping competencies of being physical education teacher; (3) most of the lesson that conducted by CALO teachers in the situation of teaching learning role play. It is also supported by idea of social constructs among teacher and student of CALO. They role's as a teacher who has capability in didactics and methodic way on the one side, and as a participant in being teacher of physical education teacher at school on the other side. The goal is mutualism interaction in planting the movement to the student at schools and get meaning contextually into movement education concept.

The teacher behavior in the School of Physical Education and Health Education is a kind of a trainer. They drill students to be capable of doing sport technical skills. They drill the students to be habituate into sport skills concept. Due to of training concept, the teacher behavior used student learning as a tool to master of sport skills. They didn't put the student's leaning as a goal. The interaction between the teacher and students comes to the situation of forcing the students to be able to do sport technical skills. The student's leaning is on the boundary of sport technique acquisition. They didn't make student' learning intensively and

intensely because the goal is sport teaching skill acquisition. Table 2. Illustrate the teaching about teaching concept in both PETE institutions.

**Table 2. Teaching about Teaching in CALO and The School of Physical Education and Health Education**

Category	Teaching about Teaching in CALO	Teaching about Teaching in The School of Physical Education and Health Education
Teacher Behavior	Educational Concept	Training Concept
Teacher—Student Interaction	Constructivistics Pedagogy	Training and drilling
The Oriented Goal	Movement development	Sport skills acquisition

### COMPARATIVE STUDY IN LEARNING HOW TO TEACH

As mentioned above this paragraph, it's come to confronting between learning and training in the discussion about student learning how to teach in PETE institution. Students behavior of both PETE institution debating the learning into and through movement and learning into and through sport. One side is for education to develop movement capability, and on another side is training to have sport skills. Both are actually learning, but on CALO that the concept on movement education focuses on making learning intensely, meanwhile on the School of Physical Education and Health Education that the concept on Sport skill acquisition learning just happened to master sport skills. In the competencies of the students that should be reached in the future of time are being physical education teacher and sport teacher (Table 3).

**Table 3. Student learning how to teach in CALO and The School of Physical Education and Health Education**

Category	Learning How To Teach in CALO	Learning How To Teach in The School of Physical Education and Health Education
Student Behavior	Learning	Training
Student Learning	Learning how to teach	Learning how to do sport
Student Competencies	Physical Education Teacher	Sport Teacher

### THE STRENGTHS AND WEAKNESSES

Every system has strengths and weaknesses. In the beginning of Indonesia's Independence day, the system was influenced by the Dutch or European system, which put sport in a club and organized by the society. Now, in most European Country, sport was developed by the club in the society, since the beginning of the year. But then, in the SPEHE since 1973 until now, the sport system was influenced by the American system, that put sport in the school's curriculum. In America, sport in school is quite strong because was supported by whether the human resources or sport facilities, and equipment as well. In the contrary of the system, PETE institution in SPEHE should choose and stated which one that should be developed by the school regarding sport for education or education for sport.

In modern society, seems to be also for many big cities of in PETE of Indonesia, people need movement. Because in modern society, people were influenced by the easy-transported, high level in technology that make the body is lazy, and foods in the many food market was so growth and the foods easily to eat, so that why people needs to understand about movement than sport. Movement is general. Movement is easy matter. Movement is a basic



need. Movement is not needed so much equipment. Movement is important to have a fit and handling the Non-Generative-Diseases (NDG), such as diabetes, obesity, high blood pressure, and stroke. Movement should be a partner of people daily life. Movement can bring someone to have a good better of life, to have a good quality life, because through movement, people can know their body and people also know their movement identity.

In qualification of teaching physical education teacher education, physical education teacher should have qualification and competencies in educational rather than in a training mainstream. The education's competencies that should be attached on PE teacher are communicated educationally to student in their own learning way. It means, the PE teacher who can influence the student to participate and learns movement meaningfully and contextually to the student needs and society needs. The physical education teacher should know didactically and methodically in enhancing student's movement. More than that, it is a need to have PE teacher who can do planting movement than PE teacher whose planting sport skills. Because, planting sport skills to the students need a talent, good positive attitude, time, and certain capability as well.

In the real concept of physical education at school, it is kin of education of or through the physical. It means education into or through movement. But then, it can be also education into or through sport. In the foundation of basic philosophy of physical education, it should be focus on student learning that will be developed by applying movement for education and sport for education as well. This mean, education in the real context of student learning should a priority in conducting physical education at school.

Confronting movement education concept and sport concept, finally, depend on what we are going to achieve in conducting physical education at school. It should be clear, with considering the student's need and society's need, it is important to conduct physical education at school focus on movement education concept. Off course, there are many strengthens in doing physical education as a movement education concept rather than sport concept. But then, it should be continued to enhance sport within social responsibility. Applying Sport concept at PETE institution and at almost Indonesian Schools tend to be sport technique skills acquisition, with empty learning process, decreases movement culture as well (Table 4). Physical education teacher or even sport teacher at schools taught the student in focus too much to have the student capable in doing sport. They teach sport technique to all of the students at elementary or even at secondary students.

**Table 4. The Strengthen and weaknesses of both movement education concept and sport concept.**

<b>Category</b>	<b>CALO—Movement Education Concept</b>	<b>The School of Physical Education and Health Education—Sport Concept</b>
Benefit	<ul style="list-style-type: none"> <li>○ Student learning process</li> <li>○ Movement development</li> </ul>	<ul style="list-style-type: none"> <li>○ Sport technical skills acquisition</li> </ul>
Weaknesses	<ul style="list-style-type: none"> <li>○ Sport at the club</li> </ul>	<ul style="list-style-type: none"> <li>○ Empty learning process</li> <li>○ Movement decreases</li> </ul>

#### **PETE IN THE SPEHE FOR THE FUTURE DIRECTION**

It is not intended to point out that movement education concept is a better concept rather than sport concept. But, indeed, it is important to consider the situation and the condition where the physical education is located. Regarding the student needs and society needs and job market related to physical activity and sport, it is important to see the future will be that the goal should be reached. There are two important things, such as (1) movement is general concept; and (2) didactics and methodic way to teaching physical education professionally. By considering this perception, it is co-stated with the idea of Crum (1993) that in conducting

PETE should be as movement education institution which develops Critical Constructive Movement Socialization Concept.

## CONCLUSION

According to PETE oriented curriculum in SPEHE, the curriculum was influenced by two different countries. The first era was oriented to movement in the years 1956 – 1973. The second orientation was influenced by sport concept that came from the sport socialization concept of the American system. Meanwhile in the last four years, one of the biggest PETE in Indonesia (SPEHE) has been connected with the concept of movement education of CALO-Windesheim University the Netherlands. PETE Indonesia for almost 40 years has been developing sport concept which influence to the reality of physical education on the core of school curriculum and profession of physical education teacher. The two things come up, after four decades in a misleading situation and condition of PETE and PE in Indonesian schools. *First*, the miss leading in philosophically that the sign is an empty meaning of education as a goal. *Second*, miss leading in pedagogically concept, which the sign is more training sport concept than educational concept.

PETE in institution should be as an educational institution, which should focus on socialization movement concept. It is also a need to be more applying didactical and methodical concept. Due to the development of economical growth, high technology, social and culture intervention, and political involvement, PETE institution in Indonesia should be moved from sport concept to movement educational concept. This means socialization of movement among the students is to fullfilled society needs and understanding to body movement which can be entered the people to have good quality in life into and through movement.

## REFERENCES

- Acevedo, E.O., dan Ekkekakis, P. (2006). *Psychology of Physical Activity*. Champaign Illinois: Human Kinetics.
- Adang Suherman, (2013). Membangun Kualitas Hidup Bangsa Melalui Pendidikan Jasmani. *Makalah Pengukuhan Guru Besar*. Bandung. Universitas Pendidikan Indonesia
- Auweele, Y.V. et. al. (1999). *Psychology for Physical Educators*. Champaign, Illinois: Human Kinetics.
- Cheatum B.A. dan Hammond A.A. (2000). *Physical Activities for Improving Children's Learning and Behavior. A Guide to Sensory Motor Development*. Champaign IL: Human Kinetics.
- Clancy, M.E. (2006). *Active Bodies, Active Brains Building Thinking Skills Through Physical Activity*. Champaign Illinois: Human Kinetics.
- Crum, B. (2003). To Teach or Not To Be, That Is The Question. Reflections On The Identity Crisis and The Future of Physical Education. Makalah pada Didactic Course On Sport Game, Bandung.
- Drowatzky, J.N. dan Armstrong, C.W. (1984). *Physical Education Career Perspectives & Professional Foundation*. New Jersey: Prentice Hill, Inc.
- Graham, G., Holt S.A. and Parker M., (2004). *Children Moving A Reflective Approach to Teaching Physical Education*. New York: Mc Graw Hill Higher Education.
- Gredler M. E. (1992). *Learning and Instruction Theory Into Practice*. New York: Macmillan Publishing Company.

- Kretchmer, R.S. (2005). *Practical Philosophy of Sport and Physical Activity*. Champaign Illinois: Human Kinetics.
- Lynn, S.K., et.al. (2007). *Seminar in Physical Education From Student Teaching to Teaching Students*. Champaign Illinois: Human Kinetics.
- Oon Seng Tan. (Eds) (2004). *Enhancing Thinking through Problem-Based Learning Approaches. International Perspectives*. Bangkok: Thomson Learning.
- Rink, J.E., (1985). *Teaching Physical Education for Learning*. Missouri: Time Mirror/Mosby College Publishing.
- Rusli Lutan (2003). *Olahraga, Kebijakan dan Politik: Sebuah Analisis*. Jakarta: KONI Pusat dan Direktorat Jendral Olahraga.
- Rusli Lutan, MF Siregar dan Tahir Djide. (2004). *Akar Sejarah dan Dimensi Keolahragaan Nasional*. Jakarta: Proyek Pengembangan dan Keserasian Kebijakan Olahraga Direktorat Jendral Olahraga Departemen Pendidikan Nasional.
- Siedentop, D. (1990). *Introduction to Physical Education, Fitness and Sport*. Mountain View: Mayfield Publishing Company.
- Siedentop, D. (1991). *Developing Teaching Skills in Physical Education*. Mountain View, California: Mayfield Publishing Company.
- Sharon Feimen-Nemser (1999). *Teacher Preparation: Structural and Conceptual Alternatives. Makalah*. Tidak dipublikasikan.
- Tinning, R. et.al. (2001). *Becoming A Physical Education Teacher*. Melbourne: Prentice Hall.
- Vendien, C.L. dan Nixon J.E. (1985). *Physical Education Teacher Education. Guidelines for Sport Pedagogy*. New York: John Wiley and Sons.
- Wuest, D.A. dan Bucher, C.A. (1985). *Foundations of Physical Education and Sport*. St Louis, Missouri : Mosby-Year Book, Inc.

# **PLAYING AIDS AND EARLY CHILDHOOD MOTOR SKILL IN KINDERGARTEN**

**Banu Setyo Adi**

**Yogyakarta State University, Indonesia  
banu\_adi@uny.ac.id**

## **Abstract**

The aimed of this study was to found out a direct relationship between the playing aids at school and the Early Childhood Motor skill. Type of this study was quantitative research. The study was conducted in the district of Kulon Progo Yogyakarta. The sources of the data in this study was kindergarten teachers. The data were collected through tests and questionnaires. The results of this study found that the categorization of the Playing aids variable shows that teachers use school facilities in high frequency (57.1% ), moderate (28.6%), low (14.3%). The early childhood motor skill variable showed high motor skill (97.7%), moderate (1.8%), low (0.5%). Based on the findings of this study, it was suggested that the school should be able to provide and develop appropriate playing aids based on the age and growth of the children, which can be utilized in accordance with the need of developing motor skill.

**Keywords:** playing aids, early childhood motor skill

## **INTRODUCTION**

Children are human beings who are growing and developing as well as having a personality different from an adult human. The differences in the form of physical and mental that has a unique character. The growth and development of children will run normally when creating a healthy environment. Science education has been growing rapidly. One of them is Early Childhood Education (ECD) that addresses education for children aged 0-6 years.

ECD conditions in Indonesia has not been well explored. This is due to an error in interpreting the pre-school education is not compulsory and is not important followed by each child. Here are the data of formal early childhood conditions in Indonesia in 2005 Dikdasmen (Slamet S , 2005:2): 1) The number of kindergarten 41 420 government 1 %, 2) Kindergarten civil servant Teacher 1 %, 3) The number Kindergarten of students 12.61 %, 4) Qualifications of linear teachers 10 %. In Kulon Progo Regency Kindergarten condition is also not much different. The total number of kindergarten is 321 with details of A 89 accredited, accredited accredited B 200 and C 32 (Dikpora, 2010).

On the behavior of modern life, the existence of common habits that cause children to be less movement. Lack of play environments safe, secure, and stimulating the growth and development of children is proper concern to parents and teachers. As a result, many children are less mobile due to just sit in front of the television or computer. Imam P Chairman of Conscience The World Foundation in an interview said, "Based on observation, I was concerned with the social and physical fabric of our society is becoming one of the inhibiting factors for our children to enjoy and reap the benefits of the basic activities that they desperately need, which is play."([Http :// www.cuplik.com](http://www.cuplik.com)).

Differences motion behavior is influenced by several factors including: individual, experience, and training (Gallahue and Ozmun, 2002: 45). Exercise through the utilization of the means to be one thing that can help the child's motor development. In some kindergartens, encountered some use was less plaything, while the child's motor ability in the final report (report book) still evolving.

The formulation of the problem to be solved in this study is: Is there a direct relationship between the school play facilities with early childhood motor skill?

## **Early Childhood Education**

According to Law No. 20 of 2003 Article 1, Section 14 of the National Education System declare that early childhood education is an effort aimed at the development of children from birth to the age of six years are done through the provision of educational stimulation to assist the growth and development of the physical and spiritual readiness in order to have a child entering further education.

Early childhood education in the National Education Act No. 20 of 2003 Article 28, section 3 is expressed as a formal education is formed Kindergarten (TK), Raudatul Athfal (RA), or other equivalent forms.

According Sugiyanto and Sudjarwo (Sumantri, 2005: 12) psychic future kindergarten included in the early stages childhood aged 1 to 6 years. While Jean Piaget put forward in this period included in the preoperational stage of concrete with a limited ability to receive stimulation (Masitoh, et al, 2005: 9).

Factors affecting motor development is nutrition, exercise and physical activity (Gallahue and Ozmun, 2002: 175). Motor skill development process will run with increased performance capabilities muscles through exercise habit. An early age is a good time to develop motor. Motor learning, early childhood emphasis on basic locomotor movements and basic motion nonlokomotor also developing manipulative movement and gymnastic abilities (Rae, P , 2000:64). Locomotor ability is also referred to as the body's ability to move from one place to another. Nonlokomotor ability is a movement that takes place as it stands, kiss knees, and sat (Rae, P ,2000: 106). While the manipulative ability and basic motor skills involve the entire object or basic motor skills involve the receipt and the return of the object (Rae, P, 2000: 113).

Dorothy E (2005: 13) classify the motor abilities of early childhood into two groups as described in the table below.

**Table 1. Childhood motor skills Ability 4 to 6 years**

Age 4-5 years	Age 5-6 years
<ol style="list-style-type: none"> <li>1. The Child climbing stairs with alternating feet , but still down on the same foot on each pedal</li> <li>2. Can turn while running . At the end of the year the child is able to run and stop at will , but can not be avoided</li> <li>3. Trying to run fast , but might not succeed</li> <li>4. Jumped 7-9 times</li> <li>5. Can walk forward 2.5-3 meters above the beam width of 7.5 cm and backward as far as 1.5 m 1 .</li> </ol>	<ol style="list-style-type: none"> <li>1. Children began to dodge and move his feet to grow</li> <li>2. Can run fast, start, and stop at will while running</li> <li>3. Can jump 10 times or more</li> <li>4. Can lope small, and at the age of 6 years will be jumping up and down with the ball at his feet</li> <li>5. Could jump, reaching for something with his arm as high as 5-7.5 cm</li> <li>6. Developed to run on top of the beam 3.3 meters wide and 7.5 cm backwards as far as 2.4 m</li> <li>7. Rope or ladder to climb the pole, the child may be trying to climb a tree</li> <li>8. Were able to do as far as 38-45 cm stepping, running, jumping as far as 70-88 cm, and ran to jump an obstacle as far as 23 cm.</li> </ol>

## 1. Physical Characteristics of Early Childhood

Childhood has an age limit and understanding different, depending on the perspective used. Sofia Hartati (2005: 7) early childhood identified as an mini adult human, still innocent and yet can do nothing or in other words have not been able to think. Is a small human child who has the potential still to be developed. Kindergarten teachers need to know the specific characteristics of the foster children. By the time a child reaches the age of early stage there are clearly different characteristics infancy. The difference lies in appearance, body proportions, weight, body length and the skills they possess. Special features found in children ages Kindergarten (Aip Sarifudin, 1980: 28-29) are:

### a. Bones skeleton

Growing of kindergarten children slower when compared with the growth rate in the age of 1 (one) up to 1 ½ (one half year). Bones of kindergarten still the cartilage. Until bones flexibility to prevent cracking, although a child often falls.

### b. Growth of muscles

Muscle growth in young children is limited to large muscles. Some skills developing, ie with the use of the muscles of the arms, legs, and abdomen. The development of a variety of uneven motor skills. A child can be reduced interest and proficiency in a

particular skill while he shows progress in others.

c. **Development of organs**

The composition of organs of the child's body has matured enough, until habits should be; as in the case of eat, sleep, defecate, and so on (elimination) is sufficient. Children pay attention to the tools and their functions or work. Masturbation or masturbation (passion usually found in young men among adult and not be able to channel lust the passion in right place) in children often accompany such interest. Because of the relationship with the world outside the home more widespread, the likelihood of injury resulting from contact with another object will be more often, so the possibility of infection (infectious) can be increased.

## **2. Forms of Early Childhood motor skills**

An early age is a good time to develop motor. In developing the child's motor skills will also be followed by other developments such as observing, remembering, memorizing, and others. In general views of muscle involvement in the motion are classified into two, namely:

a. **Gross Motor Movement**

Gross motor movements are skills that require most of the child's body (Victor G Simanjuntak, et al, 2008:6-23). This movement involves large muscles are coordinated. Developing gross motor movements than the first fine motor movements. So in principle, gross motor movement is a movement that involves large muscles. Gross motor function include large muscle activity, so that people can perform various movements required in hitting the tennis ball, hard sports, riding a bike or carrying loads (Mel Levine, 2002: 205).

b. **fine motor movement**

Fine motor movement is when the movement involves only certain parts of the body only and performed by such small muscles skills using hand and finger movements right wrist (simanjuntak Victor G, et al, 2008:6-23). The hallmark of fine motor movement is on the precision and accuracy of movement. Fine motor function include small muscle activity, especially in the hands and fingers (Mel Levine, 2002: 205).

## **3. Facilities Play**

Play facilities are of natural or artificial equipment used to develop physical abilities and social, emotional and cognitive (Rae Pica , 2000: 279). Infrastructure and facilities are equipped to support the implementation of educational activities, care, and protection. Standard facilities and infrastructure include the type, completeness, and quality of facilities used in carrying out the process of the implementation of early childhood education (Permendiknas No. 58 of 2009 on the Standard ECD). Play facilities are provided with the aim to meet the needs of the students play.

Soegeng Santoso (Kamtini and Tanjung, 2005: 47) play is an activity or behavior that made the child alone or with a group using a tool or not to achieve a particular goal. Play is an activity that is carried out repeatedly and cause pleasure (satisfaction) for children to explore, discover, express feelings, creativity, and learning is fun. For the growth and development of children needed a play facilities that support. Corresponding game is a game that meets the needs of the child and in accordance with the characteristics of the child. The game should be useful to assist the growth and development of children one of which aspects of the motor. The students are expected to be stimulated and encouraged the development of his with a good play facilities.

a. **Play Facilities of Motor**

To develop the motor skills needed an early childhood stimulation. One of them provided facilities of playground equipment in the school environment. Principles infrastructure play, namely: (1) a safe, comfortable, bright, and meet the criteria for child health, (2) according to the developmental level of the child, (3) exploit the potential and the resources that exist in the surrounding environment, including waste

goods / secondhand. For ECD Formal Education Line or Kindergarten play facilities have minimum standards, namely: (1) a minimum land area of 300 m<sup>2</sup>, (2) the child has a living room with a ratio of at least 3 m<sup>2</sup> per learner, (3) teachers' room, principal's office, UKS space, latrines with clean water, and other space activities relevant to the needs of the child, (4) have educational toys, made of teachers, children, and the plant, (5) has a game facilities both inside and outside the room can develop a variety of concepts, (6) has a literacy support equipment (Permendiknas No. 58 of 2009 on the Standard ECD).

Rae Pica (2000, 279) expresses the play area is needed to provide experience and develop early childhood movement. Appropriate playground equipment available for children to develop motor skills, among others: (1) tunnels is a game resembling tunnels holes or beam used to explore the movement to children both laterally and upwards through it, surround and infiltrate, (2) platforms is the game resembles that used to cross the bridge and aims to develop children's balance, (3) tires are game resembles a pulley used to encourage children to swing and move, (4) sand is a sandbox sand that is used to provide comfort in playing with the risk of falling, (5) riding is a dexterity game that gives experience to develop the ability of visual-motor skills, (6) slides is a game which is used to provide experience climbing and sliding, (7) swings a game that used to provide the experience of coordination abilities, muscle development, and a sense of swinging freely in the body, (8) balls is a tool to develop coordination skills, (9) hoops is a game to develop motion manipulation, (10) climbing structure) is a game arrangement for climbing rope or iron, (11) balance beams are made of board games and paved with sand used to train balance.

#### b. Facilities Tools Educational Games

Tedjasaputra (Kamtini and Tanjung, 2005: 61) defines educational toys is a game tool designed specifically for educational purposes. Educational toys optimally able to stimulate and attract children, and able to develop various kinds of potential child and used in a variety of activities. The characteristics of educational toys, namely: (1) can be used in a variety of ways, (2) is intended to be a preschool especially to develop the self, (3) safety, (4) Make the child actively involved, (5) constructive nature. Play facilities can be provided with good parenting when parents support towards the development of motor abilities of early childhood.

## RESEARCH METHODS

The method used in this study is a survey method. This research looks at the relationship between the means playing with early childhood motor skills. Play facilities in schools are equipped to support the implementation of educational activities, care, and protection are in school Kindergarten.

Subjects in this study were young children aged four to six years who are enrolled in kindergarten. The study population was all students kindergarten level A and B, Kulon Progo Regency, Yogyakarta. The sample in this study is shown in Table below.

Table 2. List of Schools and Subjects Research

Number	School Name	Number of Students
1	TK PGRI Sentolo	36
2	TK ABA Kedundang	30
3	TK ABA Klayonan	34
4	TK PKK Depok	25
5	TK Negeri Pembina Panjatan	40
6	TK YM Tonobakal	29
7	TK ABA Tawang Sari	25
Number		219

The instrument used in this study is a questionnaire and tests. Questionnaire instrument is used to uncover along with the indicator variable for the utilization of play. Test instruments used to reveal the indicator variables along which motor abilities of early childhood. To test the validity of the instrument, in this study using the formula of Pearson product moment correlation (Sugiyono, 2005: 213). Suharsimi said for this reliability test using the formula Alpha (2002:171).

## RESEARCH RESULTS AND DISCUSSION

To determine the trend of the average expectations of the results of measurement used as comparison criteria were divided into three categories.

**Table 3. Research Variable Frequency Distribution Table**

Variable	Category	Score Interval	Frequency	%
Means of School	High	$66 < x$	8	57,1
	Medium	$44 < x \leq 66$	4	28,6
	Low	$x < 44$	2	14,3
	Number		<b>14</b>	<b>100</b>
Motor Ability	High	$103 < x$	214	97,7
	Medium	$76,5 < x \leq 103$	4	1,8
	Low	$x < 76,5$	1	0,5
	Number		<b>219</b>	<b>100</b>

Description:  $x$  = the total score for each subject of study

SEM results showed coefficients of direct and indirect relationship to early childhood motor skill that can be seen in the following table.

**Table 4. Direct and Indirect Relationships Research Variables**

Variable	Direct Relationship	Indirect Relationship	Total Relations
means playing with early childhood motor skill	0,054	1,246	1,300

Based on the table above, there is a direct relationship between the facilities playing with the motor skills of 0,054 early childhood as well as the above calculation shows that the direct correlation of 0.054 is smaller than the indirect relationship was 1,246. This means indirect relationship between motor skills means playing with early childhood have a higher impact.

Based on path analysis the relationship between variables, it can be discussed as follows.

- 1) there is a direct relationship between the means playing with early childhood motor skills. This is in accordance with the opinion of Eric Strickland (2004) in his article suggests play using play facilities such as pipelines for dancing, will be helpful for children kindergarten explore yourself and good for basic motor movement. This suggests that the role of play facilities are very helpful in the development of motor skills of children. Based on the relationship path coefficient (0.054), the direct relationship between the level of play facilities with early childhood motor skill is higher than the direct relationship of parents' parenting variables, but is still lower when compared to the direct relationship of teacher self-concept variables and relationships indirectly from all study variables.
- 2) there is no direct relationship between the means playing with early childhood motor skills through parenting parents . Based on the above description of the relationship lines indicate the importance of the availability of good play that will provide comfort and safety for children typed play. Educational toys are available in the school can provide a stimulus to spur the development of motor abilities of early childhood.



## CONCLUSION

Based on the results of the data analysis and discussion, it can be concluded that the facilities have played an indirect relationship that is higher than its direct relationship.

The results of this study is an input for teachers and policy makers and practitioners of early childhood associated with the development of motor skills. It is suggested that the School should be able to provide and develop play facilities in accordance with the age and growth of early childhood development. Play facilities can be utilized in accordance with the need to develop a child's motor skills.

## REFERENCE

- Aip Sarifudin. 1980. *Olahraga Pendidikan Untuk Taman Kanak-Kanak*. Jakarta: Departemen Pendidikan dan Kebudayaan.
- Dikpora. 2010. [http://www.pendidikan-diy.go.id/?view=baca\\_isi\\_lengkap&id\\_p=8](http://www.pendidikan-diy.go.id/?view=baca_isi_lengkap&id_p=8). download tgl 1 Desember 2010 jam 10.15
- Enion, Dorothy. 2005. *Permainan Cerdas Untuk Anak Usia 2-6 Tahun: Musik, Lagu, dan Tarian; Kata-kata dan Angka; Seni dan Keterampilan*. Jakarta: Erlangga
- Strickland, Eric. 2004. Developing Motor Skills-Dramatically!. *Scholastic Early Childhood Today*. New York: Vol. 19, Iss. 3; pg. 9, 1 pgs. <http://proquest.umi.com/pqdweb?index=39&did=730767601&SrchMode=1&sid=11&Fmt=4&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1309923752&clientId=68516>. di download tgl 6 Juli 2011 jam 09.15
- Gallahue, D, L, dan Ozmun, J.C. 2002. *Understading Motor Development Infant, Children, Adolescents , Adults*. New York: Mc Graw Hill
- Kamtini dan Husni, W. T. 2005. *Bermain Melalui Gerak dan Lagu di Taman Kanak-Kanak*. Jakarta: DEPDikNAS
- Levine, Mel. 2002. *A Mind at a Time: Menemukan Bakat Istimewa Anak, Mengatasi Kesulitan Belajar di Sekolah dengan Memahami Perbedaan Cara Belajar Anak*. Jakarta: Gramedia
- Masitoh, dkk. 2005. *Pendekatan Belajar Aktif di Taman Kanak-Kanak*. Jakarta: DEPDikNAS
- Peraturan Menteri Pendidikan Nasional No 58 tahun 2009 tentang Standar Pendidikan Anak Usia Dini
- Pica, Rae. 2000. *Experiences in Movement With Music, Activities, and Theory: Second Edition*. Canada: Delmar Thoson Learning
- Slamet Suyanto. 2005. *Dasar-Dasar Pendidikan Anak Usia Dini*. Yogyakarta: Hikayat
- Sofia H. 2005. *Perkembangan Belajar Pada Anak Usia Dini*. Jakarta: DEPDikNAS
- Sugiyono. 2005. *Statistika Untuk Penelitian*. Bandung: CV Alfabeta
- SuharsimiArikunto.2002. *Prosedur Penelitian Suatu Pendekatan Praktek Edisi Revisi V*. Jakarta: Rineka Cipta.
- Sumantri, MS. 2005. *Model Pengembangan Keterampilan Motorik Anak Usia Dini*. Jakarta: Depdiknas

Undang-undang Sistem Pendidikan Nasional tahun 2003. [http://www.pendidikan-diy.go.id/file/uu/uu\\_20\\_2003.pdf](http://www.pendidikan-diy.go.id/file/uu/uu_20_2003.pdf). download tgl 1 Desember 2010 jam 10.20

Victor G Simanjuntak. 2008. *Pendidikan Jasmani dan Kesehatan*. Jakarta: Direktorat Jenderal Pendidikan Tinggi Departemen Pendidikan Nasional

# THE EFFECT OF TRADITIONAL GAMES TOWARD PHYSICAL FITNESS ELEMENTARY SCHOOL STUDENTS

Dewi Septaliza

Bina Darma University, Indonesia  
dewiey\_septa@yahoo.com.

## Abstract

This research begins from the low physical fitness in elementary school students. This study aims to determine the effect of traditional games to the increased physical fitness in elementary school students. It was an experiment research. The sample used was a male student of 40 people. Sampling was carried out in this study using purposive sampling technique, which is based on the characteristics of the subject as follows: male students aged 10-12 years. Instrument used was a test of physical fitness levels Indonesia (TKJI) consists of 5 items that test sprint 40 meters, chin-up, sit-up 30 seconds, vertical jump, run middle distance of 600 meters. The data obtained were analyzed by using the statistical analysis of T-test with significance level  $\alpha = 0.05$ . From the research and analysis of the data it can be concluded as follows: There was the effect of traditional games toward physical fitness of elementary school students. As a suggestion traditional game needs to be socialized in school.

**Keywords:** traditional games, physical fitness, elementary school student

## INTRODUCTION

### Background

Indonesia is a country with cultural diversity. The culture is a priceless treasure, therefore the Indonesian nation must continue to exist. With the passage of time, the development of civilization and technology now make lifestyle changes, cause the kids are not informed about the traditional game area where he lives. Modern kids already addicted to using advanced technology such as video games, online games and others. As a result, traditional children's games began to be forgotten and become unfamiliar among children. In fact, the traditional game is inherited from a common ancestor that should be conserved, in addition to explore, develop national culture and revive art and culture, the game is attempting to traditional exercise your community and promote the sport.

Various traditional games have many benefits such children to be strong physically and mentally, socially and emotionally, do not give up easily, explore, experiment, collaboration, honesty fosters leadership and others. In the traditional game that made a lot of positive elements that are beneficial for the culprit among agility, speed, accuracy, precision, strength and flexibility. These elements are expected to improve physical fitness and spiritual for children.

Children aged 7-12 years are also still love to play. With traditional methods of play through the game, the game is expected with traditional methods can improve physical fitness in children. In this case the researchers traditional games that will be given to the child's game tarik tambang, benteng and hadangan. From the observation shows that students have a low level of physical fitness. Children who have good physical fitness could potentially be athletes who excel in the future. Therefore, researchers want to make study on the effect of traditional games to the improvement of physical fitness in children.

### Formulation of the Problem

Based on the background mentioned above, the formulation of the problem in this study are as follows: Is there any effect of traditional games to the increased physical fitness in elementary school students?

### Research Objectives

The research objective is to be achieved, "To determine whether there is an effect of traditional game toward physical fitness in elementary school students?

### Benefits of Research

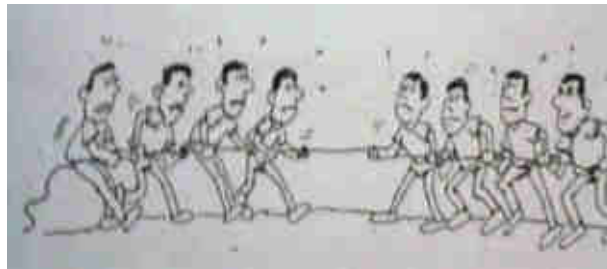
Researchers hope the results of this research can provide benefits, namely:

1. For researchers, this study is useful to know is there any effect on the improvement of the traditional game of physical fitness in elementary school student?
2. May add to the knowledge and experience of the author both in theory and practice in improving physical fitness.
3. Can promote traditional games to children.
4. For teachers, trainers and sport coaches as an input to develop a form of exercise / games to improve physical fitness in children.
5. This study is expected to be used as reading material and reference for researchers in the future.

### Literature Review

Traditional game or often referred to as folk games. According Ardiwinata (2006:1) folk games or traditional sports as the nation's cultural assets to be preserved, excavated and is grown, because in addition to a sport / game for leisure, also have the potential to be developed as a sport that can help improve the quality of physical for the culprit.

Various types of traditional sports many of the Indonesian nation. Among the types of traditional sports such as tarik tambang, benteng and hadangan. Tarik Tambang according Ardiwinata (2006:32) traditional sport played of men's and women 's team adjusted the number of members of the state premises, using a rope. In this game very dominant team strength and durability. The dominant component of physical fitness can be improved the muscle strength and muscle endurance arm sleeve.



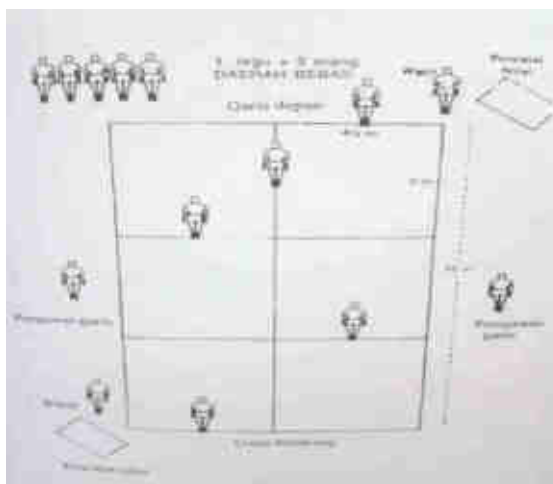
**Figure 1. Tarik Tambang Game (Source, Ardiwinata, 2006:35)**

Fort game form is a traditional game, which is widely played by children . Fortress is a game played by two groups, each consisting of 4 to 8 people. Each group chose a spot as a base, usually a pole, stone or pillar as the main benteng. The main goal of the game that is to attack and take over the 'fort' opponent to touch the pole or pillar that has been chosen by the opponent and shouting fort. Victory may also be achieved by all members captivating opponents by touching their bodies. To determine who is entitled to 'captor' and the 'captive' is determined from the last time when the 'captor' or 'captive ' touched' fortress ' their. The person closest to the time when it hits the castle are entitled to 'captor' and can chase and touch members of the opposite to make prisoners. Prisoner is usually placed around the enemy castle. Prisoners may also be released when he touched a friend. Tactic in this game, usually one-each member has a task such as 'attacker', 'spy', 'bully' and guard "fort". This game desperately needs speed and also the ability to run a reliable strategy.



**Figure 2. Benteng Game (Source, Subarjah, 2008: 3.42)**

Hadangan game is a form of traditional games that involve physical activity / physical that can improve physical fitness for the perpetrators. Traditional games have been obstructed benefits to improve physical fitness among developing cardiorespiratory endurance muscular strength muscular endurance. In this game the child must have been obstructed skills, especially skills component of physical conditions, such as: agility, speed, reflexes and movement and teamwork certainly not immune to this game.



**Figure 3. Hadang Game (Source, Ardiwinata, 2006:41)**

The game is attractive to be used as a medium for physical education and health as well as the tarik tambang, benteng, hadang and a lot of traditional games that should be developed to train movement, the mind (the tactics in play) as well as fitness training. Fitness is a major goal achieved in physical education and health. The above forms of sports games, require physical fitness component is the most dominant limb muscle strength and speed when running, arm muscle strength to pull mine and many components of physical fitness can be developed.

Physical fitness or physical fitness physical fitness is another word often called physical condition. Based Nosssek (1982:1) phrase or statement that is used for the physical condition of the domain in high performance sport is a physical fitness (physical fitness). Physical fitness is an absolute must exercise held by the student. With good physical fitness students were able to perform physical activity in sport either mild or severe category.

According to Kirkendall (1997:255) physical fitness is defined as "the ability to carry out daily tasks without feeling experienced fatigue and still have the energy to fill his spare time". The main components of physical fitness are muscular strength, cardiovascular. While other components include: muscular explosive power, agility, speed, flexibility and balance.

According Syafruddin (2011:12) "Physical Fitness / Physical Freshness is the picture quality beyond the standard functions of the body is health. Moreover, because the physical

fitness gained through physical activity that exceeds that of regular activity for health. In life, everyone has different jobs and different movement tasks. To carry out the work and fine motor tasks every individual should have a good quality of body functions, with good body function quality indicates that the individual has a good quality of physical fitness as well.

According Sumosardjuno (1998:19) physical fitness is a person's ability to perform daily duties with ease, without feeling excessive fatigue, and still have leftovers or backup power to enjoy their leisure time and sudden purposes. May be added, physical fitness is the ability to perform tasks well even in difficult circumstances, where people are less freshness, will not be able to do so.

According to Nieman DC in Ismaryati (2008:3) Elements of physical fitness is divided into two, with regard to sport include: agility, balance, coordination, speed, power, reaction time, while based on health include: aerobic, endurance, body composition, flexibility, muscular strength, muscular endurance. The components of physical fitness by Sajoto (1995:8-9) consists of 10 types: 1) Strength (Strength), is a component of a person's physical condition on his ability to use muscles to accept loads during work. 2 ) Endurance (Endurance), in this case with two known durability, namely: general endurance (endurance genera ) a person's ability to use the system in the heart, lungs and blood circulation effectively and efficiently to carry out work involving continuous contraction muscles with high intensity in a long time and muscular endurance (local endurance ) is a person's ability to use his muscles to contract continuously for a relatively long time with a certain load 3 ) Power muscle (muscular power), one's ability to use maximum force deployed in the shortest time - in a nutshell . It can be stated that the explosive power of muscle = strength (force) x speed (velocity). As in the high jump, shot put and other movements that are explosive. 4) Speed (Speed), the speed is the ability to work on the balance of movement in the same form in the shortest possible time as in run fast, punch in boxing, cycling , archery, and other. In this, ground speed and explosive speed. 5) Power supply (flexibility), flexibility is one activity in adjusting to all the activities with a broad body stretching. This will easily be marked by a degree of flexibility in the entire body. 6) Agility (agility) agility is the ability to change positions in selected areas. Someone who is able to transform a different position in high speed with good coordination, agility means good enough. 7) Coordination (coordination) is the ability to integrate a variety of different movement patterns into a singular movement effectively. 8) Balance (balance) the person's ability to control muscle nerve organs, such as the hand - stand or in achieving a balance when a person is running then interrupted. 9) Accuracy (accuracy), precision is the ability to control one's movements independent of the targets, it can be a distance or perhaps a direct object to be subjected to one part of the body. 10). Reaction (reaction), the reaction is one's ability to act quickly in the face of stimuli generated through the senses, nerves or other feeling.

Based on the above opinions regarding physical fitness plays an important role in the sport. The elements or components of the physical fitness such as strength, speed, endurance, muscle power, explosive power, agility, balance, accuracy, coordination and reaction absolutely owned, as to improve the physical fitness of all components must be developed. Of physical activity of a donation made to achieve excellent physical fitness. With good physical fitness satisfactory progress can be achieved. In this right to know the physical fitness using TKJI or physical fitness level Indonesia with consists of 5 items that test sprint 40 meters, chin-up, sit-up 30 seconds, vertical jump, run middle distance of 600 meters

## **RESEARCH METHOD**

It was an experiment research. The design of this study one group pretest and posttest design. According Sugiyono (2011:111) description of the one group pretest and posttest design as follows:

$$O_1 \times O_2$$

(1)

Description :

$O_1$  = the pre-test (physical fitness test prior to treatment)

$O_2$  = post-test (physical fitness test conducted after treatment).

Before the samples in the experimental group were treated, the group of subjects in the study were given a test early next experimental group were treated for 16 sessions, using traditional game for 3 times a week, then given a final test on the students. The population is all children-boys in SD Negeri 14 Kayuagung. The sample used was a boy of 40 people. Sampling was carried out in this study using purposive sampling technique, which is based on the characteristics of the subject as follows: male, aged ten to twelve years (10-12). Instrument used was a test of physical fitness levels Indonesia (TKJI) consists of 5 items that test sprint 30 meters, chin-up , sit up 30 seconds , vertical jump, run middle distance of 600 meters . The data analysis technique used is the T-test.

## RESEARCH RESULTS AND DISCUSSION

Data analysis techniques with a T-test. The results showed that there was a significant effect of traditional games three times a week on the level of physical fitness of elementary school students  $p = 0.000 < 0.05$ . Based on the results of the pretest, student physical fitness test had an average score of 46.89, while the posttest results of physical fitness tests students had an average score of 53.10. The result shows there is an increase of 13.23 %. The results of T-test showed that  $t = 10.75$  is greater than  $t \text{ table} = 1.64$ . This means that the hypothesis that shows the influence of the traditional game of physical fitness to elementary school students received.

Measurement of physical fitness test results showed that the students are at a low level, but after being given treatment in the form of traditional games to the students, the test results show students' physical fitness increased by 13.23 %. Measurement results show that proved to give the students traditional games can increase physical fitness. This shows the students aged 10-12 years proved that the traditional games can provide good benefits for the student physical. In other words, there is an increase in physical fitness after treated with traditional games.

Based on the results of the study showed that the administration of methods of traditional games for student to elementary school very effective in improving physical fitness. Similar to the findings of Abdul ( 2010) that traditional exercise can improve physical fitness of students of class VIII B Junior High School Khoiriyah Sumobito 2012-2013. Primary research results (2013) showed no significant effect on the traditional game of physical fitness and hours of active learning students follow the teaching of physical education.

As a sworn statement by Ardiwinata (2006:1) folk games or traditional sport as the nation's cultural assets to be preserved, excavated and is grown, Because in addition to a sport / game for filling spare time, also have the potential to be developed as a sport that can be help improve the physical quality of the perpetrator. Based on these findings and the opinion seems evident in this study

## CONCLUSION

From the research and analysis of the data it can be concluded as follows: There was the effect of traditional games toward physical fitness of elementary school students.

## SUGGESTION

Conclusions of the above study, the authors propose suggestions:

1. As a suggestion traditional games need to be socialized in school.
2. Efforts to improve the physical fitness can use traditional game.
3. For physical education teachers be more creative and innovative forms of learning or training must be tailored to the child's condition especially for learners improve physical fitness.

## REFERENCES

- Ardiwinata, Achmad Allatief, dkk. 2006. *Kumpulan Permainan Rakyat Olahraga Tradisional*. Jakarta: Kementerian Negara dan Pemuda Olahraga Republik Indonesia.
- Kirkendall, Don R, et al. 1980. *Measurement and evaluation for Physical Educators*. Terjemahan Winarno, dkk. 1997. Jakarta: AsWin.
- Ismaryati.2008. *Tes dan pengukuran olahraga*. Surakarta: UNS Press.
- Nossek, Josef. 1982. *Teori Umum Latihan*. Terjemahan M. Furqon H.1995. Surakarta: Sebelas Maret University Press.
- Sajoto. 1995. *Peningkatan dan Pembinaan Kekuatan Kondisi Fisik dalam Olahraga*. Semarang: Dahara Prize.
- Sugiyono. 2011. *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.
- Subarjah, Herman. 2008. *Permainan Kecil di Sekolah Dasar*. Jakarta: Universitas Terbuka.
- Sumosardjuno, Sadoso.1986. *Pengetahuan Praktis Kesehatan Dalam Olahraga*. Jakarta : Gramedia.
- Syafruddin. 2011. *Ilmu Kepelatihan Olahraga*. Padang: UNP Press.



# **THE HUMAN RESOURCE PROFILE OF EARLY CHILDHOOD EDUCATION (PAUD) TEACHER FOR MOTORIC ASPECT OF EARLY CHILDHOOD CHILDREN**

**Endang Rini Sukamti<sup>1</sup>, Lismadiana<sup>2</sup>, Agus Supriyanto<sup>3</sup>**

**endangrinisukamti@yahoo.com  
Yogyakarta State University, Indonesia**

## **Abstract**

This study aims to determine the profile of early childhood teacher resources for the Development of Motor Aspects in Early Childhood Education in Sleman Regency. The subjects in this study were early childhood teachers who are 210 members of the Himpaudi organization in Sleman Regency. In this study, the samples used are 60 subjects taken by purposive sampling technique which are samples taken from the groups that have been determined or that are available. The data were collected by questionnaire and interview. The implementation of this research was conducted in February 20, 2013. The method used in this research is descriptive percentage, by survey and interview techniques. The results show that: (1) 100% of early childhood teacher profile in Sleman Regency is female, (2) 67% the education level of early childhood teacher resources in Sleman is mostly educated in high school/ equivalent, (3) 63% profile of the early childhood teacher in Sleman Regency has other occupancy as a farmer / laborer / jobless.

**Keywords:** profile, early childhood education teacher, sleman regency

## **INTRODUCTION**

Early childhood is a golden period in the development of child whose the success will determine the quality of a child in his or her adult life. Montessori (Crain, William, 2007) calls it the period of sensitivity (sensitive period). The use of this term is not without any reason, nowadays, all aspects of the development in early childhood are entering very sensitive period or stage. That is, if this stage can be optimized by providing a variety of productive stimulating, the development of children in adulthood will also last productively. Some terms are also often given to early childhood, such as the name given from parents who call this the difficult age and the toy age, psychologists call it the exploration group age, age of asking, imitating age, creative age (Elizabeth B. Hurlock, 1992). To provide a range of productive stimulation in early childhood is highly dependent on the surrounding environment, such as human resources that can guide and educate early childhood development in the golden age.

This is in accordance with Fraustino Cardoso Gomes (1997), "Human resources in an organization or company need to be managed professionally in order to realize a balance between the needs of employees with the company's organizational capability demands. Human resources can function properly, if managed professionally. Some of them are by the training and development of employees or personnel involved in the organization, for example early childhood education (PAUD) teacher resources in Yogyakarta. Human resources are the result of their minds with the knowledge and experience gathered by following levels of formal and non-formal education, formal education gained through school from elementary school to higher education, while the non-formal education acquired through courses, upgrading, training, and development to improve all the potencies of humans. The development of motoric aspect in early childhood is very dependent at all on early childhood teachers in play group and parents or caregiver at home, that is why the quality of early childhood teacher resources becomes a very important factor in a child's physical development effort.

The Development of motor aspects can be done in physical activity that are selected and adjusted to the needs of the characteristics of physical development needed by childhood. The early childhood education should be able to accommodate the desire of child movement, so the need for physical education learning process is organized and structured for children. How the profile of early childhood education teacher resource for motoric aspect development of early childhood in Sleman Regency is.

## RESEARCH METHOD

This study is a descriptive study with survey method, intends to find out about early childhood teacher resource profile for the development of motor aspects in early childhood in Sleman Regency. Suharsimi Arikunto (2010) states that descriptive research is research that is not intended to test the hypothesis but only describes it as it is on a variable, symptom, or circumstance.

The population in this study was all early childhood teachers in the Sleman Regency that are still active teaching, amounting to 210 people. In this study, the sample used is the 60 subjects taken by purposive sampling technique in which the samples are taken from the group that has been determined or available. This means that sampling technique is based on certain considerations (Arikunto, 2010). The criteria of the study samples as follows: (1) early childhood education teacher in Himpaudi group in Sleman Regency (2) have a minimum one year work experience, (3) invited in PAUD socialization in the Department of Education of Department Education, Youth, and Sport of Sleman Regency.

The data in this study were collected using a questionnaire and interview containing questions that seek to identify about resource profile of early childhood teachers for motor aspect development in early childhood in Sleman. The validation process of measuring instruments uses content validity test related to the ability of instrument to measure the content (concepts) to be measured. This process uses 3 lecturers teaching the subjects of motor development.

## RESEARCH RESULTS AND DISCUSSION

### Research Result

The research was conducted in Yogyakarta on February 20, 2013, the data were taken from the entire early childhood teacher resources including: gender, education, employment, and the level of training, the amount of training, publication and socialization. The material content covers early childhood development, early childhood learning concepts and related interviews with the motor aspects of development. Here are the presented data one by one from each component:

#### 1. Gender Data

Based on the research result data, it can be inferred about the gender of the early childhood teacher in Sleman Regency as follows:

**Table 1. Gender Frequency List of Early Childhood Education Teacher in Sleman**

No.	Gender	Amount
1.	Male	0
2.	Female	60
	<b>Total</b>	60

#### 2. Education Level Data

Based on the research result data, it can be described about education level of the early childhood teacher in Sleman Regency as follows:

**Table 2. Figure of Education Level of Early Childhood Education Teacher in Sleman**

No.	Education Level	Amount
1.	Junior High School	6
2.	High School	40
3.	Diploma	7
4.	Bachelor	7
	<b>Total</b>	60

#### 3. The Data of Other Job Beside as Early Childhood Education Teacher

Based on the research result data, it can be shown the other job besides being PAUD teacher in Sleman Regency as follows:

**Table 3. The Data of Other Job Beside as Early Childhood Education Teacher in Sleman Regency**

No.	Kind of Job	Amount
1.	Farmer/ Jobless	37
2.	Entrepreneur	12
3.	Civil Servant/ Army/ Police	1
4.	Employee	9
5.	Student	1
	<b>Total</b>	60

#### 4. PAUD Teacher Status

Based on the research result data, it can be inferred about the status of the PAUD teachers in Sleman Regency as follows:

**Table 4. The List of Status Frequency of PAUD Teacher Resource in Sleman Regency**

No.	Type of Job	Amount
1.	Employee of Foundation	5
2.	Honorary	5
3.	Participant	49
4.	Student	1
	<b>Total</b>	60

#### 5. PAUD Teacher Understanding towards Development and Improvement Policy of PAUD 2003

Based on the research result, it can be implied that PAUD Teacher Understanding towards Development and Improvement Policy of PAUD 2003 in Sleman Regency is as follows:

**Table 5. The Frequency of PAUD Teacher Understanding towards Development and Improvement Policy of PAUD 2003**

No.	PAUD Teacher Understanding	Amount
1.	Understand	40
2.	Less Understand	20
	<b>Total</b>	60

#### 6. The Frequency of PAUD Teacher Following Publication and Socialization of PAUD Development

Based on the research result, it can be implied that PAUD Teacher Frequency of Following Publication and Socialization of PAUD Development in Sleman Regency is as follows:

**Table 6. The List of The Frequency of PAUD Teacher Following Publication and Socialization of PAUD Development**

No.	Following Publication and Socialization	Amount
1.	Once	39
2.	Twice	14
3.	Three Times	2
4.	More than Three Times	5
5.	<b>Jumlah</b>	60

### 7. The Level of Publication and Socialization of PAUD Followed by the PAUD Teachers

Based on the research result, it can be described that the level of publication and socialization of PAUD Development in Sleman Regency is as follows:

Table 7. Frequency List of Level of Publication and Socialization of PAUD Followed by the PAUD Teachers

No.	Level of Publication and Socialization	Amount
1.	Never	5
2.	Sub-District	20
3.	District/ Regency	27
4.	Province	5
5.	National	3
	<b>Total</b>	60

### 8. The Understanding of Material of PAUD Teacher about PAUD Development in Sleman Regency

Based on the research result, it can be described that the material understanding of PAUD Teacher Development in Sleman Regency is as follows:

Table 8. Frequency List of Material Understanding of PAUD Teachers in Sleman Regency

No.	The Understanding Level	Amount
1.	Master	45
2.	Less Master	12
3.	Do not master	3
	<b>Total</b>	60

### 9. The Mastery Level of PAUD Teacher about the PAUD Development in Sleman

Based on the research result, it can be described that the level of material understanding of PAUD Teacher Development in Sleman Regency is as follows:

Table 9. Frequency List of Mastery Level of Understanding of PAUD Teachers in Sleman Regency

No.	Level of Mastery	Amount
1.	Master	50
2.	Less Master	6
3.	Do not master	4
	<b>Total</b>	60

### 10. Design the Development of Material Content of PAUD Teachers about the Development of PAUD in Sleman Regency

Based on the research result, therefore, it can be inferred that Design the Development of Material Content of PAUD Teachers about the Development of PAUD in Sleman Regency is as follows:

**Table 10. the Frequency List of Design the Development of Material Content of PAUD Teachers about the Development of PAUD**

No.	Material Content Mastery Level	Amount
1.	Master	40
2.	Less master	12
3.	Do not master	8
	<b>Total</b>	60

#### **11. Understand/ Master the Learning Concept of PAUD Learning**

Based on the research result, therefore, it can be inferred that the understanding/mastery of the learning concept of PAUD Learning is as follows:

**Table 11. Understand/ Master the Learning Concept of PAUD Learning**

No.	Understand/ Master the Learning Concept of PAUD Learning	Amount
1.	Master	38
2.	Less Master	15
3.	Do not master	7
	<b>Total</b>	60

#### **12. Understand/ Master APE (Educative Game Equipment)**

Based on the research result, therefore, it can be described that the understanding/mastery of using educative game equipment is as follows:

**Table 12. Understand/ Master APE (Educative Game Equipment)**

No.	Understand/ Master APE (Educative Game Equipment)	Amount
1.	Master	40
2.	Less Master	17
3.	Do not master	3
	<b>Total</b>	60

#### **13. Understand/ master the gymnastic package of PAUD**

Based on the research result, therefore, it can be described that the understanding/mastery of mastery of gymnastic package is as follows:

**Table 13. Understand/ master the gymnastic package of PAUD**

No.	Understand/ master the gymnastic package of PAUD	Amount
1.	Master	35
2.	Less Master	20
3.	Do not master	5
	<b>Total</b>	60

#### **14. Implying the Content Development of PAUD Learning**

Based on the research result, therefore, it can be described that Implying the Content Development of PAUD Learning is as follows:

**Table 14. Implying the Content Development of PAUD Learning**

No.	Implying the Content Development of PAUD Learning	Amount
1.	Master	30
2.	Less Master	27
3.	Do not master	3
	<b>Total</b>	60

## **DISCUSSION**

Based on the results of early childhood teacher resource profile in Sleman, all respondents are women (100%), so it is necessary that early childhood teachers needs men to prevent gender bias in children's education from an early age. Besides, the presence of early childhood teachers both men and women and to foster the role of types in children from an early age.

Judging from the level of education in Sleman Regency, most early childhood teachers resources for 67% have high school education level or equivalent, so it needs a lot of training to early childhood teachers knowledge resources in Sleman district to make them have wider knowledge relating to Early Childhood Education Learning.

Seen from the type of work other than as early childhood teachers in Sleman, it shows 63% that they are farmers / laborers / do not work (jobless). From these results, the researcher indicates that early childhood teachers in the district of Sleman are majority as farmers, there are workers in the factory or the company and are not working (housewife) that require support from the surrounding environment so that the process of early childhood education can be run and have a good quality of education.

Regarding the status of early childhood teachers in Sleman district, it can be shown that 82% of the teachers are casual employees / participants. From these results, it indicates that the status of early childhood teachers in Sleman Regency is dominated by housewives and some students, so that it is necessary to conduct continous development in order to master learning material and content of early childhood education which can be in accordance with the growth and development of children.

## **CONCLUSION AND SUGGESTION**

### **Conclusion**

Based on the research result and the dicussion above, it can be formulated as follows:

- 1) 100 % teacher profile of Early Childhood Education in Sleman Regency is female.
- 2) 67 % profile of teacher resource education level of PAUD in Sleman Regency is high school or equivalent.
- 3) 63% profile of other occupancy beside as PAUD teachers is as farmers or laborers or even jobless.

### **Suggestion**

Based on the elaborated conclusion, the proposed suggestions can be as follows:

- 1) From the results of this research, the level of education early childhood teachers in Sleman Regency is in high school / equivalent level, so the need to support relevant agencies to early childhood teachers in Sleman Regency can improve the quality of education, for example through further study scholarships, and training that can add knowledges into early childhood teachers.
- 2) In the research, seen from just the point of view of PAUD teachers, there are other sides that can be revealed from the research results.
- 3) There needs to conduct relevant studies with broader scope, for instance, in province level so that the level of PAUD teachers in Yogyakarta Special Region can be figured out.

## **ACKNOWLEDGMENTS**

The author would like to thank profusely to Prof. Dr. Burhan Nurgiyantoro who has given the opportunity so that the article can contribute and enrich a scientific journal of early childhood

education. Moreover, the authors also thank all those who have helped the writing until the completion of this paper.

## REFERENCE

- Bambang W. Soetjipto.2002. *Paradigma Baru Manajemen Sumber Daya Manusia*. Yogyakarta: Amara Books.
- Djoyo Suryodisastro.1986. *Pengembangan Sumber Daya Manusia*. Jakarta: Karinika.
- Faustino Cordoso Gomes.1997. *Manajemen Sumber Daya Manusia*. (Yogyakarta: Andi Offset.
- Hurlock, E.B. 1992. *Psikologi perkembangan: Suatu Pendekatan Sepanjang Rentang Kehidupan (terjemahan: Istiwidayati)*. Jakarta: Erlangga.
- Nashori, F. 1999. Hubungan antara religiusitas dan kemandirian pada siswa SMU. *Jurnal Psikologika*, 8, (IV), 26-37.
- Purwodarminto, W. J. S.. 1993. *Kamus umum bahasa Indonesia*. Jakarta: Balai Pustaka.
- Suharsimi Arikunto.2010. *Prosedur Penelitian Suatu Pendekatan Praktek*. Jakarta: PT. Rineka Cipta.
- Sudjana. 1989. *Metode Statistika*. Bandung. Tarsito.
- Undang-undang Republik Indonesia Nomor 20 Tahun 2003. *Sistem Pendidikan Nasional*. Jakarta: Kementerian Pendidikan Nasional Republik Indonesia.
- Walibur Rokhman. 2002. *Paradigma Baru Manajemen Sumber Daya Manusia* Yogyakarta: Amara Books.

# **BIG BALL GAME MODIFICATION FOR LEARNING PHYSICAL EDUCATION**

**A. Erlina Listyarini**  
**Yogyakarta State University, Indonesia**

## **Abstract**

To anticipate the lack of facilities and infrastructures in elementary school physical education, teachers of physical education are expected to be creative in delivering the learning. This paper is about the basketball game modification for learning physical education in elementary schools. The basketball game consists of football game, basketball game, and volleyball games. Some modified forms of the game of football is half- field football game, four- goal football, and football triangle. Modification of a basketball game is one ring basketball, four- ring basketball, triangular basketball, and volleyball game modification consists of a mini volleyball game, volleyball squats, two- ball volleyball. Physical education facilities and infrastructures that are used are very limited. School yard facilities, as well as the rules are modified to be the game but do not leave their respective characteristics. All students in the class are always involved or included in the study, so that all active children move is expected to achieve their physical fitness. The results obtained is to create a modified model of a football game, basketball game modification model, and the model of modified volleyball game in physical education lessons, but all students must be involved in these activities.

**Keywords:** modification, learning, basketball game

## **INTRODUCTION**

Physical education is an integral part of the overall education, which aims to develop aspects of physical fitness, movement skills, critical thinking skills, social skills, reasoning, emotional stability, moral behaviour, aspects of a healthy lifestyle through physical activity. Meanwhile, education is a process of human development that lasts over a lifetime. Physical education in schools is very important. Nadisah opinion (1992: 18) states that physical education is part of the overall educational process using physical activity or movement as an educational tool as well as a goal to be achieved to complete the purpose of education itself. Educational goals is set in Indonesia Law No. 2 of 1989 of article 4 of the national education system stating that the national education aims at educating the nation and develops the complete human who is faithful, and devoted to God Almighty and virtuous, has knowledge and skills, physically and spiritually healthy, stable and independent personality as well as social responsibility and nationality of the above opinions that can be concluded that physical education is a medium for achieving educational goals .

In physical education in schools, the number of motor activity that is done in physical education activities directly or indirectly affects the physical or non- physical of students. Physical education in schools such as athletics, gymnastics games, and aquatic games is as a means to achieve the learning physical education objectives. According to Agus Mahendra (2004:18), learning objectives of physical education include 3 domains, namely cognitive, psychomotor and affective cognitive concepts include motion, sound sense, problem solving, critical, and intelligent. Psychomotor includes children mastering movements and skills, physical and motor abilities , improved organ function , affective covering child like physical activity , feel comfortable about themselves, want to engage in social interaction, self- confident.



To achieve the objectives, the role of teacher is very necessary, although it can be a successful and smooth which is influenced by several things: teachers, students, physical education facilities, and infrastructure, environment, and curriculum. The teacher as the main role should be creative in teaching, because of based field observations, most schools do not have adequate facilities physical education in accordance with the existing number of students in one school, for instance with an average students each class for 30 students only for 1 (one) soccer ball, two (2) volleyball balls, 2 ( two ) basketball balls and some other infrastructure facilities. Total infrastructure in physical education does not match the number with the number of the students, so the teacher must be creative in learning models, teachers anticipate the lack of existing infrastructure, there are 2 ways to increase the amount of physical education infrastructures by means of creating or modifying infrastructure of physical education. If the number of physical infrastructures means reasonably expected education not to be a queue waiting for a tool that will result in the student to be passive, whereas in teaching physical education in schools, it is expected that children will always be actively engaged in making students fit for the purpose that will be achieved. The second, to create or modify learning activities is appropriate physical education curriculum basic competence 2013 book V class with the theme: Healthy That Important.

KD 4.2 practices variations and combinations of the basic motion patterns based on the concept of motion in a large variety of ball games and or traditional sport of the description of the activities to be carried out or practiced by elementary school physical education teacher in accordance with the class and theme. Based on the explanation above, the writer wants to try to make big ball game modifications for learning elementary school physical education. Hopefully, it is useful for teachers of physical education in implementing learning activities and as a reference for physical education of big ball game in elementary school.

#### **Modified Football Game for Football Learning Material in Elementary School**

Football is a ball game played by two teams, each team consisting of 11 people. The target of this match is to score the ball into the opposing goal and the winner is the highest ball scorer.

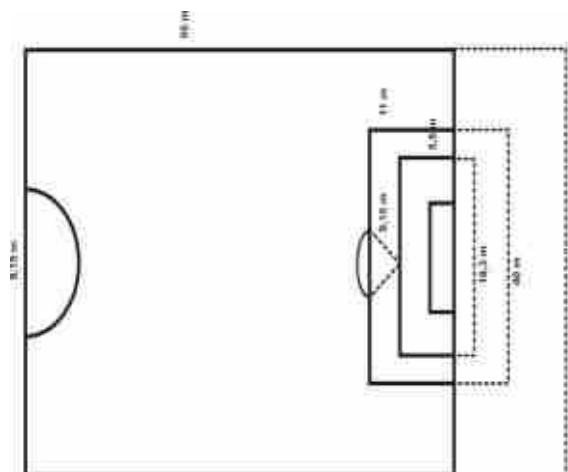
##### **Model 1. Half Field Ball Game.**

##### **Facility and Infrastructure**

- a) Facility /equipment : a. 1 Football ball
- b. 4 cones
- c. waistcoat for half number of the students

Property: Gate

Facility : Football field



**Figure 1. Half field game**

How to Play:

A number of students in class are divided into 2 groups: group A and group B. Group A's first 15 minutes as opponent is to put the ball into the goal of group B, while group B, there is one student as a goalkeeper and the other defend, to stop the ball. Offside rule is not enforced. Corner kick does not apply to the defensive team when the ball crosses the goal line after last touched by an opponent [Rud Midgley (2000:195)].

Direct free kick (penalty kick) awarded for intended foul and involves a defender in the penalty area:

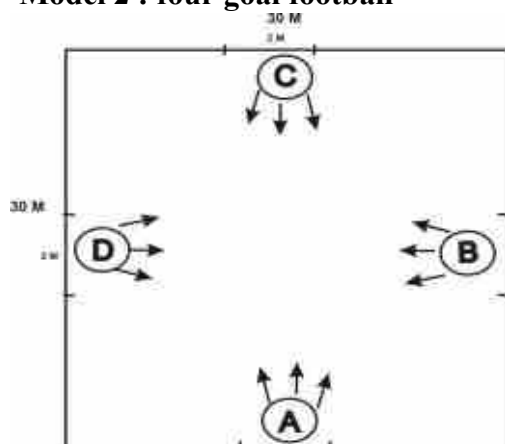
1. Tackling
2. Hold opponents by hand
3. Play the ball with hand (except the goalkeeper)

Indirect free kick:

1. Dangerous play
2. Approach and touch the shoulder when the ball is not played
3. Towards conscious disturbance, an opponent not to try playing the ball temporary.

After the completion of 15 minutes (the second 15 minutes), team B changed as opposing, the winning team is the team scoring the more.

### Model 2 : four goal football



Facility and Property:

Facility: a) plastic ball (modified ball : 2 balls)

b) 8 cones for goals

c) small flags for the field

corner

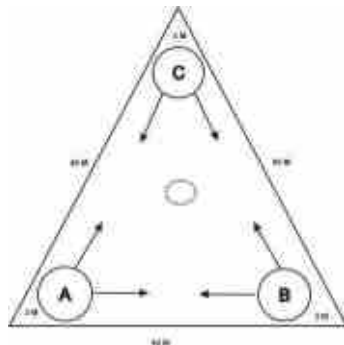
property : -

facility: school field

Figure 2. Four goal football field

A number of students of the class are divided into 4 groups: group A, B, C, and D. When ball is ready to be played, two balls held by the referee (teacher) and then thrown up for grabs. So all students play with 2 balls, team A tries to put the ball into the goal of team B, C, D. Team B tries to score Team A, C, D. Team C tries to put the ball into the goal of teams A, B, D, while the team D tries to put the ball into the goal of teams A, B, C, after the ball is put into the net of opponent, and then the ball is direct played. 20 minutes is the game time. In general, all the rules of the game in football are generally applied e.g. hand ball, penalties in fouls but no offside and penalty shot. The winning team is the team that is most scoring the ball into the opposing goal.

### Model 3 Triangle Football



**Figure 3. Triangle football field**

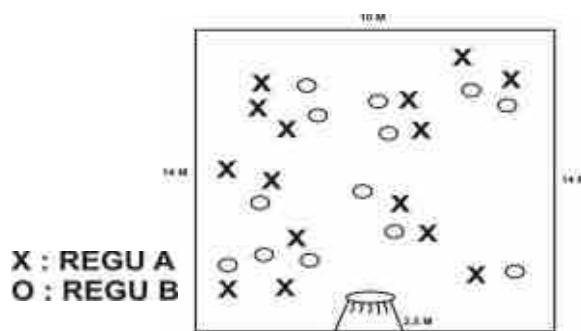
How to Play :

A number of students in the class are then divided into 3 groups: group A, B and C. A group tries to enter the ball into the goal of Team B and C, group B trying to put the ball into the goal A and C, Group C attempts to score the ball into the goal B and A. Handball is applied in the game, every time the game is played started in the middle of the field, there is no penalty kick.

### Modified Basketball Game for Football Learning Material in Elementary School

Basketball is a game played by two teams consisting of 5 players; they have the right throw, roll, and hit the ball. The match target is each team trying to insert the ball in the basket of the opponent team.

#### 1. One ring basketball game



Facility and Property :

Facility/ Equipments : One basketball ball

Waistcoats, 2 cones

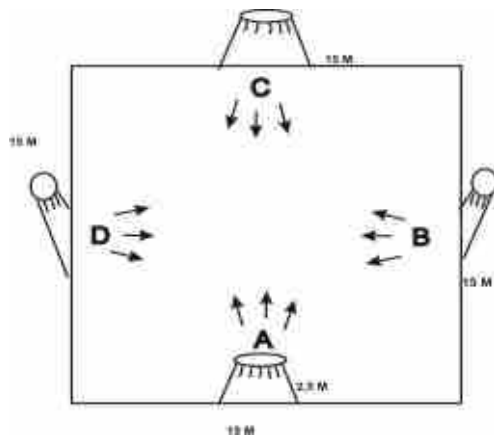
Property : Plastic basket with a post

Facility : school field

Game rule:

A number of student class is divided into 2 teams: Group A and each team try to enter the ball into the basket. Basketball thrown, hit, overthrown, or dropped, but should not be taken / being kicked on purpose. For the team putting the ball into a basketball in the basket is the winning team.

## Four Ring Basketball



Facility/ Equipments : Two basketball balls

Waistcoats, 4 cones

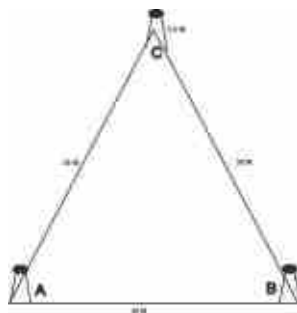
Property : Plastic baskets with four posts

Facility: school field

Game rule:

A number of students in class is divided into 4 teams: Group A, B, C, D and each team tries to put the ball one another into the opponents' basket. Basketball thrown, hit, overthrown, or dropped, but should not be taken / being kicked on purpose. For the team putting the ball into the opponents' basket the most is the winning team.

## 2. Triangle Basketball



Facility and Property

Facility and Equipments: 1 basketball, waistcoat

Property: 3 basketballs and 3 posts

Facility: school field

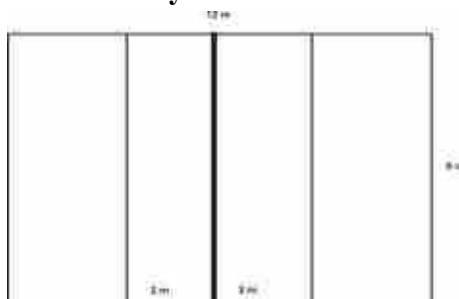
How to Play:

A number of students in class is divided into 3 teams: Group A, B, C, and each team tries to put the ball into the opponents' basket. Basketball thrown, hit, overthrown, or dropped, but should not be taken / being kicked on purpose. For the team putting the ball into the opponents' basket the most is the winning team.

## III. Modified Volleyball Game for Football Learning Material in Elementary School

Volleyball is a game with 6 players each team. The target is to send the ball over the net and within the boundaries of the field until the opponent is unable to return the ball or prevent the ball falling to the ground.

### Mini Volleyball Model



Facility and Property

Facility and Equipment: 2 modified volleyballs

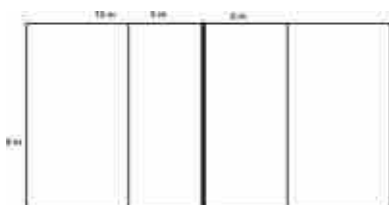
Property: net and posts

Facility: 6×12 metre mini volleyball field for 2 fields.

How to Play:

Each number of students in the class is divided into 4 groups, Group A, B, C, and D. Group A and B play in the field, groups C and D play in the another side of the field, although each team can be more or less than 6 people. Each team player is allowed to touch the ball up 3 times before throwing to the top of the net, the rest is considered to be off, the winner is that has scores 15 first.

### 1. Squat Volley Ball Game Model



How to Play:

Students in class are divided into 4 teams that are team A, B, C and D team. Team A plays against team B, team C plays against team D. The game play is every student always squats when receiving and passing/ hitting the ball. The players of team B is allowed to touch the ball three times before throwing it over the net, the rest is considered as off, the team is considered winning the game when they have scored 15 earlier.

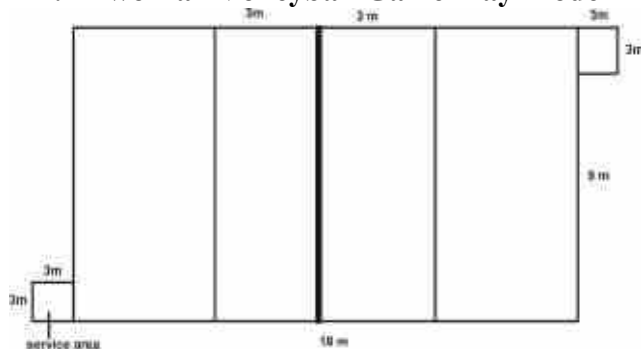
Facility and Property

Facility and Equipment: 2 modified volleyballs

Property: net and the posts

Facility: two field mini volleyball  
( the net is lowered to the ground)

### 2. Two Ball Volleyball Game Play Model



Facility and Property

Facility/ equipment: 2 standard or modified volleyballs

Property: the net and the posts

Facility: Standard volleyball field

### How to Play

The students in class are divided into 2 teams; team A and team B, so that the possible number of students per team is more than 6 people (depending on the number of students in a class). Because per team consists of many players for one field, then using two balls for the game is more active when moving and are always ready to wait the ball in a faster frequency. If there is a dead ball, the game waits until another ball is off, if it is served together. The point is obtained when the 2 balls are off, so the possibility to get points from the opponent team. The team scoring 15 first is the winner.

## CONCLUSION AND SUGGESTION

### Conclusion

The results obtained from the big ball game modification for physical education learning in primary school is a half- field football game, four goal football, triangle football, one ring basketball game, four ring basketball game, triangle basketball, mini volleyball game model, squat volleyball, and two ball volleyball.

### **Suggestion**

To anticipate the lack of facilities and infrastructures of physical education in schools, especially primary schools, the teachers are expected to be more creative in their teaching. Being creative in creating the learning models is very important at all, because not to follow the learning of students in physical education makes students passive in queue waiting in which it will not good for the learning, it is essential to change the way teachers teach students that can be in an atmosphere of joy through approaches / methods which are expected to play actively always moving not feel commanded. So students' democracy is also received as a characterized child who loves to play, but their characteristics are not supposed to leave characteristics such as discipline, respect friend / teacher, sportsmanship, honesty, etc.

### **REFERENCES**

- Agus Mahendra. (2004). Azas dan Falsafah Pendidikan jasmani. Jakarta: Dipenmas Dirjen Pendidikan Dasar dan Menengah, Direktorat Tenaga Kependidikan.
- Agus S. Suryobroto. (2004). Sarana dan Prasarana Pendidikan Jasmani. Yogyakarta: FIK-UNY.
- Dian Wijayanti. (2013). Tingkat Kesegaran Jasmani Siswa Kelas V Berdasarkan Nilai Keterampilan Gerak pada Mata Pelajaran Penjasorkes di SD N Condong Catur Depok, Sleman, DIY. Yogyakarta: FIK-UNY.
- Kemendikbud. (2013). Kompetensi Dasar SD/MI. Jakarta: Kemendikbud.
- Nadisah. (1992). Pengembangan Kurikulum Pendidikan Jasmani dan Kesehatan. Jakarta: Depdikbud Dirjen Dikti.
- Rud Midgley, cs. (2000). Insiklopedia Olahraga. Semarang: Dahara Prize.
- Rusli Lutan. (1997). Strategi Pembelajaran Pendidikan Jasmani dan Kesehatan. Jakarta: Universitas Terbuka.

# **SCHOOL AS SPORT HEALTH PROMOTION PLACE TO IMPROVE STUDENTS HEALTH LEVEL**

**Erwin Setyo Kriswanto**

**Yogyakarta State University, Indonesia  
erwin\_fik@yahoo.com**

## **Abstract**

School is place for interaction of students. School is a good place to promote the sport health in order to improve the health of students. So far, there are still some schools that have not implemented a sport health promotion, even still there are some schools that do not understand the forms of activities that can be done by the school as a sport health promoting media. This article aims at providing thought concept of sport health promotion that can be implemented in school. The types or forms of health promotion activities which can be done through the school will include: sport extracurricular activities, organizing sports festivals, organizing class meetings, fun bike, arranging sport day, the socialization of the importance of sport through seminars or workshops. The proposed concept is expected to raise the awareness and concern of school for students to improve health level through sports. The activities undertaken should be fun and raise awareness of the students to do sports.

**Keywords:** schools, promotion, sport health, students

## **INTRODUCTION**

Health is everyone's need; health can be obtained from a healthy lifestyle. Health is a human right and it is an investment, is also a gift of God, and therefore, the health quality needs to be maintained and enhanced. One way to be healthy is by exercise. Sports should be introduced early, either through parents or promotion or information through mass media and not least through schools. Many things can be done by schools to promote sport health. School is one of the important elements in the promotion of health. Students get health information, knowledge, and even application of the sport itself through schools, if the students are already embedded on the importance of exercise and practice in daily life, even not just students who have known the importance of exercise, but they also can promote the health of the sport in their environment. Health promotion is a key pillar of public health. School is a right place for sport health promotion. Schools are not only as places of learning, but also as a means for the formation of healthy behaviour through sports. The existing curriculum in schools also includes sports subjects.

Although sport subject has been included in the curriculum in schools, but it cannot optimally promote health. Sport is still considered only as a supplement not used as a necessity, but sport health promotion in schools is a strategic step in improving public health, it is based on the opinion that health promotion in school through community is the most effective strategy among other public health efforts. The population of students in a community has the greatest percentage, almost every day, there has been an interaction in school for 4-8 hours. The fact is that there are most schools prioritize the cognitive aspects of the learning process. Extracurricular activities associated with sport are still less, moreover, the activities related to sports. Regarding this, in addition to creating the school conditions, it also needs exercise so that health promotion activities in school sports need to be done.

This article aims to provide the concept of sport health promotion exercise that can be applied in schools. The types or forms of health promotion activities can be done through the

school. The proposed concept is expected to be a growing awareness and concern of schools to improve health status of students through sports, through the efforts of sport health promotion that can be implemented.

### **THE NATURE OF SCHOOL**

Schools play an important role as a basis for the formation of qualified human resources. The school functions as a socializing agent by providing the intellectual and social experiences from which children develop the skills, knowledge, interest, and attitudes that characterize them as individuals and that shape their abilities to perform adult roles "(Berns, 2004: 212-213 ). School is a building or institution of learning and teaching as well as a place to receive and give a lesson, according to the levels; there are primary school, secondary school, and high school (WJS Poerwadarminta, 1999: 889).

The school is an institution designed for teaching students / pupils under supervision of teachers. School as an educational institution is in charge of organizing the educational process and learning process in an effort to educate the nation's life. The school objective as part of a national education goals is to increase intelligence, knowledge, personality, noble character, and skills to live independently and to follow further education. Schools no longer function as a place to study, but as a place to learn applied science. They are a place for learning to express opinions and accepting other people's opinions and learning to accept the differences of each person.

School is as a system, meaning that all elements that exist in school as a whole unit, not separated from one another, such as students, teachers, principals, buildings, properties, learning devices, and so on. In independent school era, and School-Based Management (SBM) era, the first and foremost duties and responsibilities from school principle is to create schools that they lead become more effective, in the sense of becoming increasingly beneficial to the school itself and for the wider community users.

### **THE NATURE OF HEALTH**

The term healthy in everyday life is often used to indicate that something can work normally. According to Indonesian Law Number 23 of 1992 on Health, healthy is a state of well being of body, soul, and social to enable more people to live productive socially and economically (Indonesia Health Ministry, 1992). According to WHO, health is a dynamic state of health including physical, spiritual, social, and not merely the absence of disease, disability, and weakness.

Healthy can be realized by various efforts, one of the ways is with the sport health promotion in schools. Health can be obtained from regularly eating with a balanced diet, exercise, and regular resting. Health is very necessary for every human being. Healthy is an ideal situation for everyone. Having a healthy body is the desire of everyone. When in healthy condition, then the activity can be done well, and vice versa. Each person is considered able to keep his or her health up to a certain limit, however, it will be different when a person falls sick, and it is certainly the ideal state of healthy people which will be reduced or even stopped altogether. Thus, health is a basic need in life. Body condition or health status is a level state of a healthy person or sick. The increased health status in terms of social factors is in line with the increasing degree of knowledge and technology education. The higher one's education is the higher the person's health status.

### **THE NATURE OF SPORT HEALTH PROMOTION**

Health promotion is a key pillar of public health for all aspects of behavioural health programs. Health promotion is an effort to improve the community through a process of learning from- by - for and with the community, so that they can help themselves and develop



activities sourced from the public, according to the local socio-cultural conditions and supported by public health policy. Health promotion is the science and art of helping people make healthy lifestyle optimal. According to Soekidjo Notoatmojo (2007: 56) health promotion includes behavioural aspects which are an attempt to motivate, encourage and raise awareness of the potential of the community to enable them to maintain and improve their health through exercise.

The vision of health promotion is to improve society's ability to maintain and improve their health, physical, mental, social status, and expected to also be able to be productive socially and economically (Wahit Iqbal Mubarak et al. 2007:6). Health promotion in schools is a strategic step in improving public health, it is based on the premise that health promotion through community turns out the most effective schools among other public health efforts, particularly in the development of healthy behaviour. Health promotion in schools aims to enable students to act as agents of change for parents, relatives, friends, or their neighbours. School health promotion is an institution where education and health programs combined to foster health behaviour as a major factor for health -oriented school life, where the school is not only as places of learning , but also as a means for the formation of healthy behaviour. School is a community that has been organized, making it easy to reach within the framework of the implementation of the health effort. Children in school is a very potential group to accept the changes or updates, At this stage, children are in a sensitive state to stimulation so easily guided, directed and instilled for healthy living habits .

In promoting health through exercise, it is also very effective because school year is a time filled with activities. There are many things related to health promotion programs in schools, but some are related to promote the sport in an effort to improve the health of students is rarely done. According to the WHO in Robin Bunton (1995: 20) the focus for health promotion are 1) Improving access to health, 2) the development of an environment conducive to health, 3) the strengthening of social networks and social supports, 4) promoting positive health behaviour and coping strategies, 5) increasing knowledge and disseminating information. Sports health promotion in school in principle is to create a school community that is able to improve their health through exercise or understanding of the importance of exercise.

Hendrik L Blum in Soekijo Notoadmodjo (2008 : 13 ) states that health status is influenced by four factors, namely: environmental, behavioral, and genetic health service factors. Based on the fundamentals of the WHO, Physical and Health Education of Canada makes 4E grouping program as a health promotion program in schools: Education, Environment, Everyone, and Evidence. Education involves teaching and learning processes that support for health promotion for all members of the school community. Environment involves all aspects of the school environment to create a safe and supportive environment for health promotion in schools. School environment involves not only contained in the school environment (e.g., cafeteria, classroom) but also outside the school involving the environment, e.g. homes. Everyone involves all members of the school (teachers, students, school cafeteria food seller) and also outside the school (parents, school community). Evidence consists of the collaborative concept in identifying the goals, planning actions and gather all the information that can support the effectiveness of health promotion programs.

## **THE SCHOOL ROLE IN PROMOTING SPORT HEALTH**

School health promotion is in an effort to enhance the ability of learners, teachers and the public school environment to be independent in preventing disease, maintaining health, creating and maintaining a healthy environment, the creation of healthy school policy and actively participate in improving the health of the surrounding community (Indonesia Ministry of Health, 2007). Health promotion in schools is an attempt to create a school into a

community that is able to improve the health of the school community through three main activities 1) the creation of a healthy school environment, 2) maintenance and service in schools, and 3) continuous educational efforts. Promoting health through exercise can also include these three aspects. Schools can promote health through sports course policies made by the principal with input from teachers, school committees, parents and students. Schools should be a "place " that can enhance / promote the health status of learners. This concept by the World Health Organization is called by creating a "Health Promotion School".

School is an extension of family, school is the extended place to lay the groundwork child's behaviour, including behavioural health (Soekidjo Notoatmodjo, 2010: Rineka Cipta). Schools play an important role in education as a huge influence on the psychology of children, then in addition to the family as the center of education, the school also has a function as a place of education for the formation of children's personalities (Ahmadi, 2003). The most important thing in health promotion in schools is related to the use and the goals. In terms of the benefits of health promotion in schools, it can participate and build young healthy physical, mental, moral, and intellectual generation as well as supplying them with living skills (life skills). While related goals, methods, and techniques of health promotion in schools are very strategic and advantageous in terms of population aspects, aspects of individual development, and organizational aspects (Soekidjo Notoatmodjo et al, 2008: 40).

The scope or school settings of health promotion has three principles, they are: 1) involving all parts associated with health problems in schools, students, parents and community leaders and organizations in the community, 2) providing health education to the school with curriculum that can be able to improve the attitude and behavior of learners positively to health and to develop a variety of life skills that support the physical, mental and social health as well as attention to the importance of education and training for teachers and parents, 3) keeping the school to have access to the implementation of health services in schools, which is a. selection, early diagnosis, immunization, and simple treatment, b. cooperation with the local health center, c. nutritious food programs by observing the "safety" food.

## **THE ACTIVITIES OF SPORT HEALTH PROMOTION IN SCHOOLS**

Health promotion of sports in schools is expected to improve student achievement by increasing the degree of health. Educating children at school on health should be given the highest priority, not for their health per se, but also from the perspective of education, since they are to learn their need to be in good health. WHO in Soekidjo Notoatmodjo et al, (2008: 56) formulates six elements that make up the health-oriented schools, among others 1) the involvement of health and education staffs, teachers, parents, community leaders in health promotion efforts in schools, 2) the guarantee healthy and safe of environment, whether physical or psychological efforts, 3) implementation of skills-based health education and life skills effectively, 4) provision of access to health services, 5) the implementation of school policies and activities that support health, and 6) the efforts to improve the health of society as a whole .Health promotion activities in schools should be oriented from the needs of students, teachers, and even parents. Some activities that can support health promotion in schools, among others are:

### **1. Sport Extracurricular Activities**

Sport extracurricular is held in school aims to develop their interest, talent of students in sports. Extracurricular sports besides aiming for achievement are as well as to keep the students fitness. This is relevant with the statement of Junaedi (2003: 63) statement that sport extracurricular is an activity that is done outside school hours with the aim to further develop skills in a sport of their choice or talent and pleasure.

Sport extracurricular is an activity that is fun, without realizing the condition of the body to be awake. The expectation is that students love to do and then will make students need exercise. Sports activities have real purposes, one of which is intended to improve the conditioning of healthy living, physical fitness, and optimal physical performance, shaping individual attitudes, a sense of social development, knowledge, and intelligence (Indonesia Department of Education, 1993: 5)

The extracurricular activities program is basically given to all students in accordance with their values, interests, talents, and abilities. The program of extracurricular activities principally is based on applicable policies and the ability of the school, the ability of parents/ community, and the school environment. Health promotion through sport extracurricular is an effective health promotion, because students already have the motivation to do sports not only for achievement but also to increase the degree of healthy living. Sports activities are very beneficial to make the body become healthier, fitter, and more spirit. The mood becomes more cheerful .

In extracurricular activities, students are required not to be lazy to move. If the body is already accustomed to moving, the soul, the spirit, and the mind will be healthier. The principles of extracurricular activities at least explain: 1 ) the diversity of the potential , needs , talents , and interests of learners and the educational unit . 2) increase potential and overall intelligence in accordance with the level of development and ability of learners.

## **2. Organizing sport festivals**

Sport festival can be done by school so that students enjoy exercising. Festival can be packaged in a simple exercise with the goal that students can also be competitive to introduce traditional sports. Sport festival is a form of sport activities that are race and entertainment (Indonesia Law Number 3 in 2005). Sport festival is a recreational sport competitions aiming for the title or nature exhibitions, invitational, and friendship. Schools should create a program to facilitate the students to organize a sports festival. It is conceived intent to motivate students to exercise not only as a habituation healthy life but has led to a higher level.

Sports festival is intended for recreational sports coaching and development directed to promote sports in an effort to develop awareness of the school community in improving health, fitness, happiness, and social relationships. In sport festival, the sports held are for instance recreational or traditional sports. Traditional sports which can be held, among others are *gobak sodor*, *patel lele*, *jemparingan* (archery), *egrang*, etc.

## **3. Organizing class meetings**

Implementation of class meeting is an activity that develops the potentials and talents of students. This activity is carried out among classes at a school that is usually done after the test ends. Class meeting is an activity that can refresh students' mind and can make a tense mind becomes calm. This is an important activity to do for the sake of refreshment after restating the semester for student brain. This activity is to foster interests in activities, promoting sports in a small scope. The class meeting intention is solely not for competition but it is the greater intention which is in developing the sport as the need for health.

Besides, these activities are to fill the spare time before the distribution of student academic report. Usually it is held between classes. Class meeting is very useful for students, teachers and parents. Class meeting has benefits, including: 1) talent Search, with class meeting, teachers will see the potential / talent of the students. 2) mental training, class meeting activities will affect the mentality of the students. This is evident when students who usually do not dare to express their opinions in the classroom, with this activity, it turns out many of the learners to be able to show their talent. 3) to facilitate student hobby, every student has different hobbies that can be channeled through this activity. 4) to sharpen

creativity, class meeting can sharpen the creativity of the students and teachers. Especially for teachers, they should find creative ideas to make class meeting activities more alive.

#### **4. Fun Bike or Healthy Walk**

Fun bike and healthy walk are currently a public idol. This activity is healthy besides it is cheap. To promote health through this activity can also be done by schools. The existence of fun bike activity and healthy walk are initiated by school so that students are expected to follow up with cycling and walking hobbies. Activity using a bike or on foot has many benefits that can be obtained. Cycling or walking can make a healthy body as cycling and walking also includes exercise, does not cause air pollution, making it environmentally friendly, and can be cost-effective. Healthy walk is a medium of gathering, moderate exercise which is healthy and very effective in establishing communication and togetherness. Culture of cycling or walking should always be preserved in the midst of modern vehicles that are in streets.

Cycling and healthy walk are sports that are cheap, easy and can be done by anyone regardless of age, social status or economic capabilities. Cycling or healthy walk can also strengthen the brotherhood and strengthen school community, because by following a healthy walk and cycling, school community can socialize with one another in a more relaxed and familiar atmosphere. The management of fun bike or walk do not have to spend a lot of money. This activity can be carried out during holidays or on certain days. To attract participants, the door prizes can be provided. The route made should not be exhausting, but enough to burn calories; the roughly time is between 30 minutes to 1 hour.

#### **5. Outbound**

Outbound activity is a program or game that is designed specifically for high school students to develop and improve leadership and teamwork attitudes of students. Outbound activities are carried out in surrounding or open space, to make it more fun and more challenging. outbound activity is essential applied to students, in addition to reducing the saturation on day-to-day learning in the classroom. This activity can also make the body become healthy, because this activity requires participants to actively move and the cheerful and happy, and fun atmosphere, so that the physical and mental effects can be more pronounced, which is a positive effect.

Outbound is the activity carried out in the open environment by simulating some games either individually or in groups. Outbound activities are done regularly and properly that can improve the function of organs such as the heart, circulatory and respiratory as well as improve flexibility, overall durability.

#### **6. Organizing Sport Day**

Organizing sport day at the school is important. Sport is not just undertaken during school hours. All school members also need to do exercise. A good school will certainly pay attention to all aspects. Residents of the school from Monday to Saturday most use the time to gain knowledge. To improve the performance of is not only influenced by knowledge itself, but also physical fitness which is required to support the achievement of the school.

The school day for sport can be done on a certain day and the time should not be the same. This is done to familiarize the need to do sport for health, sport day is conducted to provide development opportunities in the emerging field of sport so that the balance between academic and non-academic (ME Winarno, 2012: 44). These activities are directly as an example of a friend, teacher, or employee to students. In addition to health benefits, other benefits are the harmonious relations between the residents of the school.

#### **7. The socialization of the importance of sport through seminars or workshops**

Health promotion exercise can also be done by providing knowledge to students through seminars or workshops. One of the missions of health promotion is to increase public knowledge by doing counselling, education, training, and strengthening human resources to

increase awareness, willingness and ability to live a clean and healthy (Ircham Machfoedz et al, 2005: 63). Behaviours based knowledge will be more lasting than the behaviour based on knowledge, because this behaviour is due to coercion or rule which requires it to do (Wahit Iqbal Mubarak, 2007: 28).

Seminar is suitable for large groups to target the upper middle of formal education. The seminar is a presentation (presentation) of an expert or several experts on a certain topic that is considered important and is usually considered to be up to date in the community. Topics of seminar course are adapted to the particular health promotion exercise for health. Health seminar is part of a health education to impart knowledge to the students to embed healthy behaviors through sport. Seminar is basically a socialized health program so that students will accept and participate on health through exercise. Therefore, this strategy can be regarded as an effort to foster community development atmosphere or atmosphere that is conducive to good health or an attempt to create an conducive atmosphere environment or supporting the development of health so that students are encouraged to do clean and healthy lifestyle behaviors.

## **CONCLUSION AND SUGGESTION**

School is a right place to promote the sport health in order to improve students' health status. The improved health status may also have an impact on student achievements. School can promote sport health through policies made by the principal with inputs from teachers, school committees, parents, and the students. Schools should be a "place" that can enhance / promote the health status of the learners.

The sport health promotion activities that can be done through schools are by: sports extracurricular activities, organizing sports festivals, organizing class meetings, fun bike, implementation of exercise, socializing the importance of exercise through seminars or workshops. Sport health promotion can be done starting from the increase in public knowledge by doing counselling, education, training, and strengthening human resources to increase health awareness, willingness and ability to live a healthy life through exercise. Finally, students become aware that sport is a need to improve health status. To promote the sport health, it is required the participation of all components, the school can promote sport health surely through policies made by the school principal with input from teachers, school committees, parents and students .

## **REFERENCES**

- Ahmadi A. 2003. Psikologi Belajar. Jakarta: Rineka Cipta
- Berns, R.M. 2004. Child, Family, School, Community: Socialization and Support . 6<sup>th</sup> ed  
Forth Worth: Hartcourt Brace CollegePublishers.
- Depdikbud. 1993. GBPP Penjaskes 1994 untuk SLTP. Jakarta: Dikdasmen
- Depke RI. 1992. Undang-Undang RI. No. 23 Tahun 1992 tentang Kesehatan
- Depkes RI, 2007. Pembinaan Perilaku Hidup Bersih dan Sehat di Berbagai Tatanan. Perilaku Hidup Bersih dan Sehat di Sekolah.
- Ircham Machfoedz, Eko Suryani, Sutrisno, Sabar santosa. 2005. Pendidikan Kesehatan bagian dari Promosi Kesehatan. Yogyakarta: Penerbit Fitramaya

- W. J. S. Poerwadarminta. 1999. Kamus Umum Bahasa Indonesia. Jakarta: Balai Pustaka
- M. E Winarno. 2012. Pengembangan Karakter Bangsa Melalui Pendidikan Jasmani dan Rohani. Pidato pengukuhan Guru Besar. Malang: Universitas Negeri Malang
- Notoatmojo S. 2007. Promosi Kesehatan dan Ilmu Perilaku. Jakarta: Rineka Cipta
- Robin Bunton, Sarah Nettleton and Roger Burrows. 1995. The Sociology Of Health Promotion Critical Analyses Of Consumption, Lifestyle And Risk. London and New York: Routledge is an imprint of the Taylor & Francis Group
- Said Junaidi. 2003. Pembinaan Olahraga Usia Dini. Semarang: Depdikbud
- Soekidjo Notoatmodjo dkk, 2008. Promosi Kesehatan di Sekolah. Jakarta: Pusat Promosi Kesehatan Depkes RI
- UU RI No. 3 tahun 2005 tentang Sistem Keolahragaan Nasional

# **THE INFLUENCE OF LEARNING PATTERN AND ADVERSITY QUOTIENT TOWARDS THE ACHIEVEMENT OF JAVELIN-THROW LESSON AFTER CONTROLLING STUDENT PREVIOUS KNOWLEDGE**

**Ishak Aziz**

**Padang State University, Indonesia  
60.ishakaziz@gmail.com**

## **Abstract**

The objective of this study is to find out the difference between learning pattern and adversity quotient. The research was conducted in the Faculty of Sport Science, Universitas Negeri Padang. This was an experimental research, using 2 X 2 treatment by level. Muli Stage Random Sampling was used because the populations were only 112 students. 56 students were for reciprocal learning pattern and 56 students for command learning pattern. The experiment was on the influence of learning pattern and adversity quotient towards the achievement of javelin-throw lesson after controlling the students' previous knowledge. There are seven conclusions in this research. They are: 1) after controlling the students' previous knowledge, the achievement of reciprocal learning pattern was higher than command learning pattern, 2) after controlling the students' previous knowledge, the achievement of student's javelin-throw learning process that has high adversity quotient was better than low ones, 3) after controlling the students' previous knowledge, there was an influential interaction between student's learning pattern and adversity quotient towards the achievement of javelin-throw lesson, 4) after controlling the students' previous knowledge of students, the achievement of javelin-throw lesson of students with reciprocal pattern was higher than the students who has high adversity quotient with command pattern, 5) after controlling the students' previous knowledge, the achievement of students who used reciprocal pattern was lower than those with command pattern and low adversity quotient in the javelin-throw lesson, 6) after controlling the students' previous knowledge, the achievement of javelin-throw learning process of students with high adversity quotient was better than the students with low adversity quotient in the reciprocal pattern, and 7) after controlling the students' previous knowledge, the achievement of javelin-throw learning process with command pattern of students with high adversity quotient was lower than the students with low adversity quotient. The research results imply that the achievement of students should be improved through assistantship of lecturers using appropriate learning patterns.

**Keywords:** learning pattern, adversity quotient, the achievement of javelin-throw lesson, previous knowledge

## **INTRODUCTION**

Soedijarto (2000:34) says that, education must be put on the top priority of most important to build a better generation of nation. It means every efforts must be exert to make people that has good quality. This symptoms has effect that the rise of competition between individual to other, a country to another country within the result that the effort to rise the quality of human resources is become top priority. It is the strategic function of ordinance No. 20 Year 2003 about educational system has benefit to expand the ability and make the better behavior and national civilization. Based on the national ordinance, in Sport Science Faculty, State University Padang the lecture is making to be optimal by using every activity. There is a plan before the lecture based on the syllabus; the lesson is given by a team that routinely conduct the discussion about the strategy of teaching, strategy to increase students motivation, and bring about the program evaluation. However, the final score of student is decreased lately, especially in athletic lecture, javelin throw subject. It makes some opinions from another, someone says that the measurement quality and quantity of practice instrument is not complete enough, another says the basic skills of student is very low. The method is not appropriate that is used. The learning pattern that the lecturer used is not suitable with student. However, it is

necessary to conduct the research to acknowledge the factors that make the final score of javelin throw subject are low.

Learning is the effort to use every facility and resource internal or external to someone's development. Learning is not only to develop cognitive ones, however affective, and psychomotor is also included. It has purpose to receive information, comprehension of something or to achieve a expertise (Anarinno, 1980: 39). Saffat (2009: 39) says that learning has three factors, they are; process, constant change and there is a change caused by experience. Based on those opinions above, it can be concluded that learning is the relation of change that happened in aspect of someone personality, emotional and physically. Those indicators show the ability as the result of learning is in variant; the simple ones into the complex ones. It also acknowledged as learning outcomes. It is every ability and result that achieved that measured by using learning process and indicated in numerical output (Briggs, 1979: 7). Bloom (1981: 7) says that learning outcomes is the change result of behavior into three aspects, they are cognitive; (1) knowledge, (2) Comprehension, (3) Application, (4) Analysis, (5) Synthesis, and (6) Evaluation. Knowledge, comprehension, and application is categorize as low cognitive ability. Affective aspect such as: (1) Acceptance, (2) Attention, (3) Reaction, (4) Adaptation, (5) Appreciation, and (6) Control. Psychomotor aspect such as: (1) Imitation, (2) Utilization, (3) Carefulness, (4) Coordination and (5) Naturalization. Harrow in Slavin (1994 : 497) says that by making (1) reflect movement, (2) fundamental movement, (3) perceptual ability, (4) Physical ability such as: weight lifting, long distance cycling, (5) accustomed movement and (6) communication without discourse are prominent. Another dominance aspect in javelin throw subject is psychomotor or motor ability. The characteristic of motor ability after follow up the lesson is, Kiram (1996: 18):1) says that 1) first phase of motor is development and mastering coordination roughly, 2) second learning phase, development and coordination mastery softly, and 3) third phase of learning is stabilizing coordination ability and formed a skills. The learning outcome motor lesson is a human activity to change the behavior in training process to achieve ability. It means, it is necessary to have motor learning process.

Uno (2007:191) says that behavioral change that appears toward the object is concrete. This inspection has been formed as movement based on material. A lecturer gives an order to students to do that movement is a stimulus and student who use their thought when that movement do is a response and the result is concrete. It has relation with javelin throw subject. After the lecturer give the example of movement, the student should try it in order to their technique is better than before. Javelin throw is one of athletic number that appear in old Greek sports competition. It is throwing long-cylindrical with measured weight thing that formed like bamboo and has made by using metal as the material. It is done by releasing the javelin by using single hand that posed on the side of body. It has purpose to achieve longest distance by releasing it from the tip of fingers based on the rules.

Willpower and endurance is important in this sport. Husdarta (2010:32) says that willpower is kind of will to achieve something better than before. It means the will is coming from the inside of individual that acknowledge as motive. Motive means a power that individual has that make him or her to do something. It means motive is movement capacity that appear inside subject in order to do some activity to achieve some purpose (Purwanto, 2010 : 62). In order to achieve that purpose, the willpower is necessary to exist inside individual mind. Stoltz (2005:6-7) says that there are four benefit of willpower, they are: (1) willpower explains how far someone can face the trouble and their ability to face it; (2) willpower can predict which one can survive or not, (3) willpower can predict which one can exceed their limit and fail, (4) willpower can predict which one can give up and not. Someone ability to face difficulty, he or she must have survival instinct inside the mind, because, someone achievement is not only measured by using their intelligence, however willpower is important too. In another word, willpower recently appear in the necessity to achieve something by empowering his or her own self (Bompa, 1998 : 436). It means, willpower can be indicated by using four indicators: (1) control, (2) confession, (3) ability range, and (4) endurance. It means willpower in this research is student's ability to response the difficulty that they face. Djamarah (2002:5) says strategy can be defined as general motive of learning and teaching into four aspects: a) identify and state the specification and qualification of student's behavioral change. B) to choose learning process theory based on aspiration and life view of people, c) to choose and state the procedure, method and learning technique and d) state the rules and minimal limit of achievement to do learning evaluation program. Muston and Ashworth (2010 : 87) says that learning strategy in his way is by giving some



tasks to students to train with partner and change the role simultaneously. There is a time the student becomes a subject and observer by using the instructional purpose that the teacher stated before. Reciprocal learning pattern is the individual in class is organized in groups. The teacher give the group's tasks as doer (d) and observer (o), the lecturer can play the role as someone who gives explanation to every group about what should they do. The task of doer is similar with learning pattern; communication by using observation. The task of observer is give a feedback to doer and communicate to lecturer. Lecturer task is watch closely both of doer and observer, however the communication is only with observer (Byra , 2006 : 11). The observer should give the feedback simultaneously to the doer by using a work paper that formed by lecturer

Meanwhile, in command learning pattern, every decision Is taken by lecturer absolutely. In another hand, the lecturer communicates every decision for every part/episode/process in learning process. Lutan (1988: 128) says that command learning pattern is teaching guide that lecture use by giving material as training pattern per part. In this learning pattern, the important elements are the lecturer demonstrates when he or she gives the material to the student and the student is given enough time to practice.

## RESEARCH METHOD

Based on the problem and operational purpose of research, this research is using deign treatment by level 2 X 2 methodologies. This method is chosen in order to observe the effect by using learning pattern, after the learning pattern is implemented at least six times, it will be done a test of javelin throw.

Sampling technique is using Edwards (1985: 15) multi stage random sampling in three stages: (1) choose the learning class by using purposive technique,: every student have same purpose who take javelin throw subject in similar semester (2) choose the class for sample , it using random technique in two section for 120 students, (3) choose the sample for each research cell that using simple random sampling; it is the data from four women students is not used and the data from 4 men students is not complete. It means the sample is 112 in total, only for men students. Analysis techniques include descriptive analysis, regulation test analysis and inferential analysis. It is necessary to test the hypothesis before do inferential analysis based on regulation test analysis such as: 1) Normality test, 2) homogeneity test, 3) Linearity test, 5) covariate influence toward variable and 5) regression line test.

## RESEARCH RESULTS AND DISCUSSION

The result of descriptive analysis of basic ability and learning outcome in javelin throw subject for every research group is appear on Table 1 below:

**Table 1. score recapitulation of basic ability and learning outcome in javelin throw subject for every research group**

B		A				Σ	
		A <sub>1</sub>		A <sub>2</sub>			
		X <sub>11</sub>	Y <sub>11</sub>	X <sub>21</sub>	Y <sub>21</sub>	X <sub>1</sub>	Y <sub>1</sub>
B1	N	14	14	14	14	28	28
	$\bar{X}$	11,04	18,96	7,25	13,06	9,70	16,29
	S	2,97	2,23	1,96	1,82	2,81	3,26
	Varians	8,84	4,97	3,83	3,32	7,89	10,66
	Min	5,35	14,90	4,65	10,70	4,65	11,75
	Max	15,65	22,85	10,30	16,10	16,50	22,85
B2	N	14	14	14	14	28	28
	$\bar{X}$	8,36	13,63	10,71	16,16	8,97	14,63
	S	1,92	1,33	3,15	2,34	3,12	2,83
	Varians	3,68	1,78	9,90	5,47	9,74	8,02
	Min	4,65	11,70	6,65	13,05	4,65	10,50
	Max	11,65	16,10	16,50	21,20	15,65	21,20
	N	28	28	28	28	56	56
	$\bar{X}$	9,53	16,01	9,22	14,89	9,35	15,46

B	A				$\Sigma$	
	A <sub>1</sub>		A <sub>2</sub>		X <sub>1</sub>	Y <sub>1</sub>
	X <sub>11</sub>	Y <sub>11</sub>	X <sub>21</sub>	Y <sub>21</sub>		
	S					
Vars	9,31	13,03	7,99	5,16	8,65	9,09
Min	4,65	10,70	4,65	11,70	4,65	11,13
Max	15,65	22,85	16,50	21,20	16,08	22,03

Explanation : A= Learnin Pattern, A<sub>1</sub> = reciprocal learning pattern, A<sub>2</sub> = command learning pattern, B= Willpower, B<sub>1</sub> = high willpower, B<sub>2</sub> = low willpower, X<sub>1</sub> = basic ability, and Y<sub>1</sub> = javelin throw learning result

Normality test analyzed by using Lillefors test with the significance value  $\alpha = 0,05$ . It show treated sample from population is normally distributed. Homogeneity test from treated sample from this research is done by using F-test and Bartlett test that show there is no variants difference between the tested groups. It means the data is come from homogeny population. Linearity and covariate X test has influence toward free variable (Y). Meanwhile the equal regression line also show that F-test by using regression line for every equalize cell factors.

#### Hypothesis test

Test result of analysis requirement is fulfilling criteria to conduct covariate analysis (ANKOVA). For next step, it necessary that to conduct inferential analysis in order test the research hypothesis.

1. Javelin throw subject learning result that using reciprocal pattern is higher rather than command learning pattern, after controlling basic ability.

**Table 2 : F test statistic about the influence A and B factor and interaction A\*B toward learning result of javelin throw subject after controlling X in average.**

Variant Sources	JK <sub>res</sub>	Df	RJK	F	p
Intercept	380,766	1	380,766	206,443	0,000
X	107,750	1	107,750	58,420	0,000
A	22,506	1	22,506	12,202	0,001
B	24,914	1	24,914	13,508	0,001
A * B	62,534	1	62,534	33,904	0,000
Error	94,065	51	1.844		
Total	13881,425	56			

Based on analysis above, it show that  $p = 0.001 < 0.05$ , and the value of  $F_{count} = 12,202 > F_{table} (0, 05/1/55) = 4, 02$ . It can be concluded that  $H_0$  is not acceptable. It means that learning result that using reciprocal pattern is higher than command learning pattern after measuring basic ability. It can be draw the conclusion that there is a difference between reciprocal and command learning pattern toward learning result after controlling basic ability of student.

2. Learning result of student who has high willpower is higher than student who has low amount of willpower, after controlling basic ability.

Based on variant analysis of two sides of data by using GLM (General Linear Model) procedure is showing that analysis model regression Uni-variant directly. Based on table 2, the value of  $F_{count} = 13,508$  with the value of  $p = 0.001 < 0,05$ , can be concluded  $H_0$  is unacceptable and the data is suitable with this research. In another word, the learning result of javelin throw subject for those who high amount of willpower is higher rather than who have it in low amount after controlling basic ability.

3. There is interaction influence between student learning pattern and willpower toward learning result Javelin throw subject, after controlling basic ability.

The similarity ANKOVAN Uni-variant in table 2 above is using to test the influence of interaction factors between (Colum) learning patterns and (row) willpower toward learning outcome of Javelin throw subject after controlling basic ability. Base on statistic F test in table two

above the value of  $F_{\text{count}} = 33,904$  and  $p = 0,001 < \alpha = 0,05$ . Those values is higher than  $F_{\text{table}}(0,05; 1/51) = 4,02$ . It make  $H_0$  is refused. It means based on this result there is influence between interaction of learning pattern and willpower toward learning result of javelin throw subject after controlling basic ability of students.

The effect of interaction and main influence of learning pattern form and will power after controlling basic ability is significance, in covariant analysis above, therefore, the test is continued by using ANKOVA T-Test between data pairs in order to measure which group is higher between two subjects in average.

Hypothesis test of simple effect is purposed to test hypothesis between two sample groups. in this case, there are four simple hypothesis (simple effect) that will tested: (a) the difference of reciprocal and command pattern toward group who have high amount of willpower by controlling students basic ability in javelin throw subject (b) difference between students who treated by using reciprocal and command after controlling basic skills in javelin throw subject, (c) the difference of learning result between student who have high and low amount of willpower who treated in reciprocal pattern after controlling basic ability in javelin throw subject. And (d) learning result between who have high and low amino of will power that treated in command pattern after controlling basic ability in javelin throw subject. This simple effect hypothesis test will be backed up with SPSS program ; by using GLM Uni-Variat procedure in (1) X B A\*B to examine hypothesis (a) and (b); (2) X A A\*B to examine hypothesis (c) and (d).

4. Examine the difference learning outcome of javelin throw subject between student who treated in reciprocal is higher than command pattern for student who has high amount of willpower after controlling basic ability.

**Table3. Parameter estimation to test difference between Y average toward A factor for every B factor by controlling X**

Parameter	B	Std. Error	T	p
Intercept	10,140	0,867	11,696	0,000
X	0,562	0,074	7,643	0,000
[B=1]	1,331	0,573	2,008	0,040
[B=2]	0(a)	.	.	.
[A=1] * [B=1]	11,438	2,022	5,652	0,001
[A=1] * [B=2]	0	-	-	-
[A=2] * [B=1]	15,924	2,018	7,891	0,001
[A=2] * [B=2]	0(a)	.	.	.

Based on statistic value of T-test in table 3 row  $[(A=1)*(B=1) = 5,652$  in value of  $p 0,001 < 0,05$  ; therefore  $H_0$  is unacceptable. It means the data is suitable for research hypothesis. It can be conclude that especially for  $B_1$  (student who have high amount of willpower) , the learning outcome that given reciprocal pattern treatment is higher than command ones by controlling basic skill before.

5. Learning outcome student who treated in reciprocal is low rather than command for who have low amount of willpower, after controlling basic ability. Based on statistic value T-Test in table 3 line  $[(A=2)*(B=1)] = 7,891$  with  $p$  value  $0,001 < 0,05$ ;  $H_0$  is refused and can be concluded the data is supporting the hypothesis of research. It can be concluded that especially for  $B_2$  group (student who have low amount of willpower) who treated by reciprocal pattern, the learning outcome is lowest than command ones, after controlling basic ability.
6. Examine the difference javelin throw subject learning outcome between student who have high amount of willpower rather than low ones that treated with reciprocal pattern after controlling basic ability.

**Table.4. Estimation parameter to test average difference Y between every factor B for every level a factor by controlling X.**

Parameter	B	Std. Error	T	Sig.
Intercept	10,140	0,867	11,696	0,000
X	0,562	0,074	7,643	0,000
[A=1]	-1,207	0,541	2,230	0,030
[A=2]	0(a)	.	.	.
[A=1] * [B=2]	3,828	0,550	6,961	0,001
[A=1] * [B=1]	0(a)	.	.	.
[A=2] * [B=2]	-1,332	0,573	2,342	0,030
[A=2] * [B=1]	0(a)	.	.	.

Based on statistic value T-Test toward table four row  $[A=1]*[B=2]$  value  $T = 6,961$  with  $p = 0,001 < 0,05$ ; it means can be concluded that especially in  $A_1$  (students who treated in reciprocal learning pattern) in javelin throw that has high amount willpower is higher than student who has low amount of will power, after controlling basic ability before.

7. Learning outcome of student in javelin throw subject that treated in command pattern and have low amount of willpower is higher than student who has high amount of willpower after measuring basic ability.

Based on table four above, the statistic value T-test in row  $[(A=2)]*[(B=2)] = 2,324$  with  $p$  value  $p = 0,030 < 0,05$  therefore  $H_0$  is unacceptable means the data is suitable toward hypothesis. It means especially in  $A_2$  (student who treated with command learning pattern) the learning outcome is higher than student who have high amount of willpower, after controlling basic ability.

### Analysis

In this research, javelin throw learning outcome is the result that gained from students body motor ability that throw the javelin as far as possible by using the rules that stated by Persatuan Atletik Seluruh Indonesia (PASI). In following explanation below, it explain about difference between learning pattern and willpower toward Javelin throw subject learning outcome after controlling student's basic ability.

The difference javelin throw learning outcome between reciprocal and command pattern after controlling basic ability show the result of first hypothesis test. It shows that student who treated in reciprocal pattern has high result rather than command ones. In this case can be draw the conclusion that in order to gain the learning purpose, reciprocal pattern is more effective rather than command learning pattern.

Based on the result of calculation it appear that the average final score of student group who treated in reciprocal learning pattern is 9,70 meanwhile in command pattern is 8,63. It means final score of student who treated with reciprocal learning pattern is better than command learning pattern. Meyer in Muhfida (2010 :12) says that the way of reciprocal learning process are : information, instruction, stated in group in module read-and take conclusion. The benefits that appear in this learning pattern are information task that student should to accomplish, and the student can give a help to members of their group about the tasks. Thus, every student in the learning group actively gives an advice to member of his or her group.

The difference of learning outcome for student who high amount of willpower is higher than who have low amount willpower, after controlling basic ability. Based on research finding, students group who have high amount of willpower has better final score rather than the low ones. Based on data analysis toward student group average score for those who have low amount of willpower is 9,22 and for high one is 9,53. It means learning outcome for student who have high amount willpower is better than the low ones.

The success in javelin throw learning process the lecturer not only counts on student motor movement. There is another aspect that lecturer should pay attention to it: student will, in another word as acknowledged as willpower. Without willpower, student will not achieve the maximal result.

The lecturer should give the lesson to be more creative, innovative and in enthusiasm. It shows that the influence of will power has relation with student characteristic.

There is interaction influence between learning pattern and willpower toward learning outcome of javelin throw subject, after controlling basic ability. The result of hypothesis prove that there is interaction between learning pattern and student's willpower and it influence toward javelin throw learning outcome after controlling basic ability. Student group who high amount of will power and treated with reciprocal pattern, gain better score rather than student who treated in command learning pattern. It shows that influence of learning pattern by using reciprocal pattern has relation with student characteristic. However, for student who have low amount of willpower that treated in reciprocal learning pattern, the result is in below of who treated in command learning pattern. It shows that command learning pattern also has relation with student characteristic. The reciprocal learning pattern is effective when treated to student who have high amount of willpower. In another hand the command learning pattern is effective toward student who have low amount of willpower. Both of them have relation with subject characteristic and interaction with those learning pattern.

The difference javelin throw learning pattern between reciprocal and command learning pattern that have high amount of willpower, after controlling basic ability, based on research result, is student who have treated in reciprocal and have high willpower will take better result rather than command ones. Based on calculation of student group who have high amount of willpower and treated in reciprocal learning pattern after controlling basic ability, the overall average score is 11,04 and who treated with command pattern, the score is 7,25. It means the student who has high amount willpower is effective to treat her or him by using reciprocal pattern.

Based on analysis finding, student who has high amount of willpower and treated with reciprocal pattern, the average overall score is better than treated by using command learning pattern. It has relation with Hamilton argumentation about those two patterns. The difference of implication of reciprocal learning pattern pays attention to the difference of individuals in range of ability. However, command learning pattern does not have general standard for a task.

The difference of javelin throw learning outcome toward reciprocal and command learning pattern for student who have low amount of willpower after controlling basic ability. Based on the research result, there is significance different between javelin throw learning outcome in student group who have low amount of willpower by using command and reciprocal learning pattern. based on the calculation, the student who have low amount of willpower and treated in reciprocal pattern, the overall average score is 7,25, however in command pattern the average overall score 10,71. It can be conclude that learning outcome that treated in command pattern and have low amount of willpower is better than by using reciprocal learning pattern.

The conclusion of this analysis is student who have high amount of willpower have characteristic cannot accept the commandoes, due to it will become barrier of their creativity. However, student who have low amount of willpower is able to accept the command and able to do it in pattern, it help them to have maximal learning outcome.

## CONCLUSION

Based on the finding and considering the limitation of research can be conclude that : (1) learning outcome for student who treated with reciprocal learning pattern is higher than command ones. (2) Javelin throw learning result for student who have high amount of willpower is higher than low ones after controlling basic ability.(3) there is interaction influence between student learning pattern and high amount of willpower toward javelin throw learning result after measuring basic ability. (4) Student learning outcome in javelin throw subject that treated in reciprocal is higher than command ones. (5) Javelin throw learning outcome toward student who have low amount of willpower and treated in command pattern is higher than reciprocal ones. (6) Learning outcome of javelin throw toward student who have high amount of willpower and treated in reciprocal pattern is higher than treated in command pattern. (7) Javelin throw learning outcome toward student who has high amount willpower who treated in command learning pattern is lowest than treated in reciprocal learning pattern.

## REFERENCES

- Anarino, Anthony A. Curriculum Theory and Design in Physical Education. St Loius: The CV. Mosby Company, 1980.
- Bompa, Tudor O. Theory and Methodology of Training: The Key to Athletic Performance. New York: Department of Psysical Education New York University, 1998.
- Bloom, Benjamin S., Max D. Engelhart, Walker H. Hill, Edward J. Frust, dan David R. Krathwohl. Taxonomy of Educational Obyective. Handbook 1: Cognitive Domain. New York: Logman Inc, 1981.
- Briggs, Leslie J. (ed). Intructional Design Principles and A Applications. New Jersey: Prentice-Hall, Inc, 1979.
- Byra, Mark. Resiprocal Style of Teaching, A Positive Motivational Climate 2006 <http://www.questia.com/googleScholar.qst?docId=5002582653>, (diakses 05 Februari 2010).
- Djamarah, Syaiful Bahri dan Aswan Zain, Strategi Belajar Mengajar. Jakarta: Rineka Cipta, 2002.
- Edwards, Allen L. Experimental Design in Psychological Research. New York : Harper and Row, Inc. 1985.
- Husdarta,H. J. S. Psikologi Olahraga. Bandung: Alfabeta, 2010.
- Kiram, Yanuar. Belajar Motorik. Jakarta: Proyek Peningkatan Tenaga Kependidikan Direktorat Jenderal Pendidikan Tinggi Depertemen Pendidikan dan Kebudayaan, 1992.
- Lutan, Rusli. Belajar Keterampilan Motorik, Pengantar Teori dan Metode. Jakarta: Direktorat Jenderal Pendidikan Tinggi Depertemen Pendidikan dan Kebudayaan, 1988.
- Mosston, Muska dan Sara Ashworth. Teaching Physical Education. New York: Mcmillan College Publishing Company, 1994.
- Muhfida. Model Pembelajaran-Free Ebook (Bse) SD, SMP,SMA,SMK <http://sumetris.co.cc>, 2010.
- Purwanto, M Ngalim. Psikologi Pendidikan. Bandung: PT. Remaja Rosdakarya, 2010.
- Shaffat, Idri. Optimized Learning Strategy, Pendekatan Teoritis dan Praktis Meraih Keberhasilan Belajar. Jakarta: Prestasi Pustaka, 2009.
- Slavin, Robert A. Educational Psychology. New York: Allyn & Bacon, 1994.
- Stoltz, Paul G. Adversity Quotient,. terjemahan T. Hermaya. Jakarta: Grasindo, 2005.
- Soedijarto, Pendidikan Nasional Sebagai Wahana Mencerdaskan Kehidupan Bangsa dan Membangun Perabadan Negara-Bangsa. Jakarta: Cinaps, 2000.
- Uno, Hamzah B. Model Pembelajaran Menciptakan Proses Belajar Mengajar Yang Kreatif dan Efektif. Jakarta: Bumi Aksara, 2007.
- Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional.

# **KNOWLEDGE LEVEL STUDENTS PJKR C FORCES 2011 ABOUT VIOLATIONS AND PENALTIES IN FOOTBALL GAME**

**Nurhadi Santoso**

**Yogyakarta State University, Indonesia**

**nurhadi\_santoso@uny.ac.id**

## **Abstract**

Students PJKR C forces 2011 following lectures are still a lot of football games that have not been understood correctly about the breach and what punishment should be given to the player who makes the offense/violation and unsportsmanlike conduct. The purpose of the research is to find out the level of student knowledge PJKR C Force 2011 regarding violations and penalties in the game of football. This research is descriptive quantitative research. The method used survey methods. Subjects in this study were students PJKR C class of 2011 who took the course as many as 51 students of the game of football. The instrument used to obtain the data in this study used self-made questionnaire using content validity and reliability of 0.79. Data analysis techniques using descriptive statistics. Research results through statistical analysis has been done on the level of student knowledge PJKR C Force 2011 to offenses and penalties in a football game as follows: very high category by 2 students (3.92%), high category as many as 16 students (31.37%), Moderate categories as many as 18 students (35.29%), less categories total of 10 students (19.61%), and very less so as a category 5 students (9.80%).

**Keywords:** knowledge, violations, and penalties

## **INTRODUCTION**

Football a sport that is very popular with almost all walks of life the world. In Indonesia, football is very popular in the community from Sabang to Merauke, ranging from children, teens and adults. They could play a football game anywhere, either on the football field, fields are depleted plucked or vacant land that could be used for play. They are very simple to play football without referees to enforce the rules as much as possible / simple, but they still show the game being honest when they made mistakes. Field without the line, the goal of rocks or trees, but they can play happily without any fights while upholding honesty and friendship. This is because they do for recreation, spare time, and even to improve their skills even without a coach.

Football is a sport game played by two teams where each team consists of 11 players. The purpose of each team tried to incorporate as many balls into the net and trying to maintain his own net in order not to concede the ball, which is done according to the rules of sportsmanship and the game. Teams that make a lot more goals against the opponent declared the winner in the match.

Students PJKR is physical education teacher candidates must master the basic skills of playing soccer through courses Motion Football Association. Here students learn the basic techniques of playing football. In Motion Football Association courses, lecturers will provide teaching materials to students of various basic engineering skills to play football without the ball (running, jumping and feinting without the ball) and the ball soccer techniques, namely: kicking a ball, dribble, ball control, heading the ball, steal the ball, shoot on goal, throw-in, feinting and special techniques goalkeeper. Diversity of the basic techniques to be mastered

by students as a preparation for teaching to play football in the future. Students PJKR as prospective physical education teachers should know and even have to master the basic skills of playing soccer. Football courses Basic Motion granted in semester III, this course provide supplies to students on mastering the basic techniques to play football. The students who have taken courses Motion Football Association is expected to have the basic skills to play football well.

In semester IV courses students acquire the Football Game in principle this course apply the basic techniques in how the offense and defense strategies, solve problems in the field, as well as understanding and practicing the rules of the game and the match in the learning process. Through the course Football Game, students also must know, understand and practice the rules of the game and a bit of game rules in the field during the learning process. Regulation soccer game easily understood by frequent reading the rule book, but in its application many students experiencing difficulties.

During this time, students are still many who do not understand the rules of football games, especially the game-related rules. Regulations issued by the football game FIFA 17 is composed of the rules. Students tend to know the rules of the game are practically in the field when play is all kinds of violations and penalties, although not in depth. Most students wrestle the game of football as a hobby or for achievements in their respective clubs, but the knowledge about the kinds of offenses and penalties are still very limited. They know all kinds of violations and penalties when a player does play hard / use excessive force.

This will appear when the student tries to become a referee refereeing practice his friend when playing, often misrepresented offenses and penalties so little debate. Often seen students in umpiring decisions give less precise, players who are not punishable offenses. Game rules if applied in the field is very situational, so it needs to really understand the forms of the offense and the punishment should be given. Through learning soccer game theory students are expected to have knowledge and be able to practice on tactics, strategy, game rules and game rules in a real football game.

Students PJKR as prospective physical education teacher and human being engaged in sports should understand the various rules violations and penalties should be given. People often assume students know about every sport and its rules. In addition, students PJKR indirectly as agent learners in the community, no society rarely ask him something about the events in the game of football. This is because the people of Indonesia at any time presented a live broadcast of football matches national and international via private television broadcasting.

## **LITERATURE**

### **1. Knowledge Itself**

According to Big Indonesian Dictionary (KBBI) Online, knowledge means everything that is known; intelligence: everything that is known or with respect to (a subject). The knowledge according to some experts is: <http://shahibul1628.wordpress.com/2012/02/24/sense-knowledge/> taken on 8 August 2012:

- 1) According Pudjawidjana (1983), knowledge is the reaction of a man by stimulating the surrounding nature through contiguity through the senses and the object of knowledge is the result of conduct that occurred after the sensing of a particular object.
- 2) According Ngatimin (1990), knowledge is the memory of the materials that have been studied and the possible concerns about binding together a set of comprehensive material matters detailed by the theory, but what memories will be given using the appropriate information.
- 3) According Notoatmodjo (2007), knowledge is the result of this idea and after the conduct of sensing towards a particular object. Sensing occurs through human senses,



the senses of sight, hearing, smell, taste and touch. A large part of human knowledge acquired through the eyes and ears.

Some sense knowledge can be concluded that the knowledge of everything that is known is derived from sensory contiguity to a particular object. Knowledge is essentially the result of the process of seeing, hearing, feeling, and thinking is the basis of human and behave and act. Pius Partanto Indonesian dictionary (2001) knowledge associated with everything that is known to be associated with the learning process.

## 2. understanding Football

Football is a very popular sport in the world and the sport is very easy to understand. Football is also a sport that knows no caste, everyone is allowed to play football. On May 21, 1904 stood the world soccer federation FIFA abbreviated (International Federation of The Football Association). Football in Indonesia is shaded by an organization that is entitled to arrange everything for the betterment of football in Indonesia called PSSI (Indonesian Football Association). PSSI was established on 19 April 1930. The game of football is played by two teams each consisting of 11 persons his team players including goalkeeper. The game of football is headed by a referee and two assistant referees helped. Old football games are 2 x 45 minutes with a break of no more than 15 minutes , rectangular playing field, the length should not be more than 120 feet and shall not be less than 90 meters, while the width should not be more than 90 meters and must not be less than 45 meters (length of the field in international matches antara 100 meters to 110 meters, while the width of the pitch between 64 meters and up to 75 meters).

All the players may play the ball with the entire body except the hands. Goalkeeper may play the ball with his hands, but only in the area of his own net. Each team tried to include as many balls into the opponent's goal and try to prevent the opponent to put the ball into the net.

The game of football is one sport that is popular with the people of Indonesia and widely played by all levels of society ranging from children, teens, and parents. In addition, the sport is also played by many women, both in foreign and domestic. The game of football is very popular in the community, so do not be surprised if every afternoon met a lot of children, adolescents, and adults playing football on the football pitch as well as vacant land.

Luxbacher (2004: 2) states that the football played by two teams, each consisting of 11 people. Each team maintains the goal and trying to break through the opponent's goal. Sucipto, et al. (2000: 7) defines the game of football is a team consisting of 11 players and one goalkeeper. Akros Abidin (2000: 26) revealed that the football game is played by two teams, each team consists of 11 players including the goalkeeper. Roji (2004: 1) explains that football is done by two teams, each team consists of 11 players including the goalkeeper. Setiap reserve player for his team is seven players. Old games are 2 x 45 minutes. According Muhajir (2004: 22) that football is a game made by a punt, which has the objective to enter the ball into the opposing goal and maintain the goal in order not to concede the ball.

Football is a team sport, therefore in addition to the ability of the technique a football player should be able to work together with other players in a football team. Described by Soedjono (1985: 16) football is a team game, so teamwork is a football game that demands to be met any teams that want to win.

Based on some opinions on the above it can be concluded that football is a team game played by two teams consisting of 11 players in each of his team, including the goalkeeper, every team has a goal to put the ball into the opponent's goal and prevent the goal just as much to his own goal during game which lasts 2 x 45 minutes.

## 3. Rules of The Game

Every sports game definitely have regulations that aim to manage the game so that the game can run well. Football a sport that has rules of the game. Regulations issued by the football game FIFA 17 is composed of rules, namely: 1) the field of play, 2) the ball, 3) the number of players, 4) the player equipment, 5) the referees, 6) the referees assistant, 7) the duration of the match, 8) the start and restart of play, 9) the ball in and out of play, 10) the method of scoring, 11) offside, 12) fouls and misconduct, 13) free kicks, 14) the pinalty, 15) the throw-in, 16) the goal kick, and 17) the corner kick.

Rules of the game football has beberpa times experienced Anomalies related increments in accordance with the development of the game of football, for example, first ball used only 2 now 6 pieces, balls back pass from forward to goalkeeper should not be held by the keeper. Regulation 11 of these regulations explains the offside where a player is not a foul if only to be in an offside position. A player standing in an offside position, does not violate the provisions of the offside if a player receives the ball directly from a goal kick, throw-in, and corner kicks. A player who wants to try to hit, tackle, kick the opponent may be subject to violations and penalties.

#### 4. Violations and Penalties Itself In Football Game

In the game of football, offenses and penalties are very crucial thing in a game of football both at local, national, and international. This often happens protest against the player for a foul and the referee awarded a penalty which the court on the ground. Players who commits an offense can be punished: 1) the indirect free kick; 2) direct babas kick; 3) direct free kick and a warning (yellow card); 4) direct free kick and expulsion (red card), and 5) the direct free kick (penalty) and ejection (red card). Violations committed by players should not be punished immediately when a foul (wait until the ball is dead) and punished immediately when a violation occurs.

Abuse and disrespectful behavior / evil punished in the following manner: Direct free kick (kicking or attempting to kick an opponent, a tackle or try to tackle an opponent, jumps toward the opponent, hitting or trying to hit an opponent, pushing an opponent, the opponent men-tackle/menyerang in order to get the ball to touch the opponent before touching the ball, hold / held the opponent, spitting at an opponent, holding the ball on purpose). Awarded a penalty kick, if one of the top 10 violations committed by a defender in the area pinaltinya own, regardless of where the ball is, the origin of the ball in the game.

An indirect free kick awarded to a player who did one of the 6 following: 1) Taking more than 6 seconds; 2) Touching the ball again with his hands after it is released from the handle; 3) Touching the ball with his hands after the ball deliberately kicked to him by a teammate; 4) Touching the ball with his hands after receiving directly from a throw-in taken by a teammate; 5) Obstruct / hinder movement of the opponent, and 6) Stonewall keeper to release the ball from his hands.

#### 5. Subject DescriptionThe Football Game

This course weighs 2 credits (1 credits 1 credits theory and practice) and taken by students who have passed the course Motion Football Association. Students are expected to know, understand, and practice the game and the game rules and principles of football tactics approach. Lecture material covers the rules of the game and the game of football, as well as understanding the game of football in a tactical approach that includes: scoring (retain possession of the ball, attacking the goal, creating and using space when attacking), preventing a goal (maintaining the space, keeping the goal area, grab the ball) , restarting the game (throw-in, corner kick, free kick) methodically through the theory and practice courses. Assessment is based on participation lectures, independent and group assignments, theory and practical exams.

## RESEARCH METHOD

### Types of Research

This research is descriptive quantitative survey method, so that the step is not necessary to formulate research hypotheses. The purpose of this study was to determine the level of student knowledge PJKR C class of 2011 on violations and penalties in the game of football. Suharsimi Arikunto (1998: 239), states the following non-descriptive study is a research hypothesis but only describe it as it is on a variable, symptoms, or circumstances. In this study wanted to find a picture of what it is about student knowledge neighbor offenses and penalties in the game of football.

### Definition of Operational Research Variables

According Suharsimi Arikunto (2006: 118) declares a variable is an object of research or what is the focal point of an investigation. The variable in this study is the level of student knowledge PJKR C Force 2011 to offenses and penalties in the game of football. The definitions of the variables in this study were undergraduate students who demonstrate the ability PJKR C class of 2011 defines a kesebuah pemecahkan knowledge gained through the test problem, which in this study was measured by a questionnaire.

### Subjects Research

Subjects in this study were students PJKR C class of 2011 who took the course "Football Game" which amounted to 51. The details of the subject of study as follows:

**Table 1. Details of the research subject**

Class	sex	Subjects
PJKR Force C Class 2011	Man	46
	Girl	5
	Sum	51

### Instruments and Data Collection Techniques

#### 1. Research Instruments

The instrument is a tool that is selected and used by researchers in the study of data collection, so that the data obtained can be accounted for. Instrument in this study are compiled in the form of a questionnaire to determine students' understanding of the game of football in particular violations of the rules and penalties in the game of football. According Suharsimi Arikunto (2009: 151) questionnaire is a number of written questions used to obtain information from respondents in terms of statements about personal or things that are known. According Sutrisno Hadi (1991: 7) there are three steps that must be taken in drafting the variables into sub-variables factors. Sub-variables in this study are the factors that mengkonstrak violations and penalties, three steps are:

##### a. Defining construct

The definition construct in this study is the level of student knowledge PJKR C Force 2011 to offenses and penalties in the game of football.

##### b. Investigate factors

The second step is to investigate the factors that make up the construct, namely 1) the indirect free kick; 2) direct babas kick; 3) direct free kick and a warning (yellow card); 4) direct free kick and expulsion (red card), and 5) the direct free kick (penalty) and ejection (red card)

##### c. Arrange the grains questions

The third step is to draw up a grain of questions that refers to the factors that affect this study, namely 1) the violation by the indirect free kick; 2) direct infringement by babas kick; 3) the violation by a direct free kick and a warning (yellow card); 4) with a direct free kick offense and expulsion (red card), and 5) with a direct free kick

offense (penalty) and ejection (red card). To measure the rate assessed by questionnaire answers. If the answer is "true value is 1 and if the value is 0.

**Table 2. Knowledge Instruments lattice Students PJKR C Force 2011 About Violations and Penalties In Football Games**

Construct	Factor	question	Sum
Student Knowledge PJKR Force C 2011 About Violations and Penalties	Violations by the indirect free kick	2, 4, 5, 7, 14, 20,	6
	Violations with a direct free kick	1, 3, 6, 8, 10, 19, 21, 22, 23, 24, 30	11
	offense with a direct free kick and a warning (yellow card)	9, 11, 13, 18, 25, 28	6
	offense with a direct free kick and expulsion (red card)	12, 15, 16, 17, 26, 29	6
	Off side	27	1
Total			30

To use the instrument validity content validity. Use of content validity, the degree of validity memngambarkan a measuring instrument or the test because the test was able to measure the properties that must be contained in the content or subject matter provided (Nurhasan, 2001:34). The instrument has been developed by content meteri learning delivered by the rules of Fifa football game.

Tests of the reliability of the instrument using two split technique. Based on the results of the reliability calculation halved from 15 respondents obtained reliability of 0.79. Tests done in one shoot instrument that means experimental data taken simultaneously with the actual data retrieval.

## 2. Data Collection Techniques

Data collection techniques are methods used by researchers to collect data. Data collection techniques in this study is a useful questionnaire to determine the level of student knowledge PJKR C Force 2011 to offenses and penalties in the game of football. In a research instrument there are two types of questions, namely the question of positive and negative

### Techniques of Data Analysis

This study is a descriptive analysis deskriptif or by using descriptive statistics. Descriptive statistics were used to analyze statistical data in a way to describe or depict the data that has been collected as is without intending to apply general conclusions or generalizations.

Categorizing the level of student knowledge PJKR C Force 2011 to offenses and penalties in the game of football into five categories, namely: very high, high, moderate, less, very less. Categorizing the level of student knowledge PJKR C Force 2011 to offenses and penalties in the game of football using the formula of Anas Sudijono (2009: 453) as follows:

**Table 3. Norma Categorizing Characters**

No	category	range of Score
1	very High	$X \geq M + 1,5SD$
2	High	$M + 0,5SD \leq X < M + 1,5SD$
3	Moderate	$M - 0,5SD \leq X < M + 0,5SD$
4	less	$M - 1,5SD \leq X < M - 0,5SD$
5	Very less	$X < M - 1,5SD$

## RESULTS AND DISCUSSION

### Description of Data and Research Findings

#### 1. Description of Research Data

Results pengolahan data on the level of student knowledge PJKR C Force 2011 to offenses and penalties in the game of football is obtained descriptive data, as follows: the range of scores obtained knowledge of the offside rule averaged 24.333; value of at least 18; maximum value of 29; while the standard deviation of 2.44677; variance value of 5.987; range 11.

#### 2. Results

The results showed the level of student knowledge PJKR C Force 2011 to offenses and penalties in the game of football in the very high category 2 student (3.92%). Students who have knowledge of violations and penalties in the game of football in the high category, there are 16 students (31.37%). Students who have knowledge of violations and penalties in the game of football in the medium category, there are 18 students (35.29%). Students who have knowledge of violations and penalties in the game of football in the poor category there are 10 students (19.61%). While students who have knowledge of violations and penalties in the game of football in the category of less than once there are 5 students (9.80%).

**Table 4. Categorizing Students Knowledge Level About Violations and Penalties In Football Games**

No	range of Score	category	Frekuensi	Prosentase
1	$X \geq 28,00$	Very High	2	3,92%
2	$25,56 \leq X < 28,00$	High	16	31,37%
3	$23,11 \leq X < 25,56$	Moderate	18	35,29%
4	$20,66 \leq X < 23,11$	Less	10	19,61%
5	$X < 20,66$	Very Less	5	9,80%
Jumlah			51	100%

### Discussion

In the results of the study show the results for the category sanagt less by 5 students are students whose daughter had been lacking to understand the rules of football game. To understand the rules of football games correctly not only theory, but must often play football and watch football games both at local, national, and internationally on television. Students rarely daughter playing football in addition to the current practice on campus and rarely watch a football game on television. Especially pay attention to the referee during the match lead in applying the rules of the game.

Students in categories A total of 10 people, as in playing football is very less and the student does not come into play outside of lecture hours (to play in the football club). In samaping, students in the category of less basic movement skills to play football is not good. Student interest in participating in learning theory in the classroom is also less. Thus, it affects the student's knowledge of the rules of the game of football.

Mahaiswa in the category of good and very good, indeed these students love to play football. Students participate actively in this case football clubs in their own villages. This looks very good football playing skills. Students also actively attend classes theoretical and often ask about things that did not already know about the rules of the game. Thus, the activity of lectures and develop skills through football club is very influential on the level of knowledge of students to the game rules.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

Based on the results of the analysis has been done on the level of student knowledge PJKR C Force 2011 to offenses and penalties in a football game as follows: very high category by 2 students (3.92%), high category as many as 16 students (31.37%), category were a total of 18 students (35.29%), categories A total of 10 students (19.61%), and less so as a category 5 students (9.80%).

### Suggestion

By knowing the results of the study, then the thought of giving suggestions for subsequent research: It is necessary to study the correlation between students' knowledge of violations and penalties in the game of football with the results of arbitration practice in the field.

## REFERENCES

- Akros Abidin.(2000). *Materi Pendidikan Jasmani Dan Kesehatan*. Jakarta : Erlangga.
- Anas Sudijono. (2009). *Evaluasi Pendidikan*. Jakarta: PT Raja Grasindo Persada.
- FIFA. (2010). *Laws of The Game (Peraturan Permainan (terjemahan)*. Jakarta: PSSI.
- Luxbacher, Joseph A. (2004). *Sepakbola (terjemahan)*. Jakarta: PT Raja Grafindo Persada.
- Muhajir. (2004). *Pendidikan Jasmani Teori dan Kesehatan*. Bandung: CV. Angkasa
- Nurhasan. (2001). *Tes dan Pengukuran Dalam Pendidikan Jasmani*. Jakarta: Depdiknas, Dirjen Pendidikan Dasar dan Menengah Bekerjasama dengan Dirjen Olahraga
- Roji.( 2004). *Pendidikan Jasmani Untuk SMP Kelas VIII*. Jakarta: Erlangga
- Sudjono : (1985). *Sepakbola, Taktik dan Kerjasama*. Yogyakarta : PT. Badan Penerbit Kedaulatan Rakyat.
- Sucipto, dkk. (2000). *Sepak Bola*. Departemen Pendidikan Nasional. Perpustakaan FIK UNY
- Suharsimi Arikunto. (2006). *Prosedur Penelitian Suatu Pendekatan Praktik*. Jakarta: PT Rineka Cipta.
- (1998). *Prosedur Penelitian: Suatu Pendekatan Praktek*. Jakarta: Rienika Cipta.
- <http://shahibul1628.wordpress.com/2012/02/24/pengertian-pengetahuan/>

# **STUDY OF INFORMATION SYSTEMS MATERIAL STRENGTH TRAINING PROGRAM FITNESS ACTIVITIES FOR ELEMENTARY SCHOOL CHILDREN**

**Ranu Baskora Aji Putra**

**Semarang State University, Indonesia  
r.aji.unnes@gmail.com**

Physical fitness development programs for elementary schools received less attention in particular . Report the results of national research , among others, the fitness level of our society mean less . Data of SDI( Sport Development Index) 2006 states that approximately 37.40 % in the category once ; 43.90 % less ; 13.55 % moderate ; 4.07 % good , and only 1.08 % either once ( Mutohir , Toho Cholik and Ali infallible , 2007 : 111 )<sup>26</sup> , it is still difficult to find the presence of a teacher Physical education around us were competent and successfully manage their subject , so that students love , respect and sincere in following the learning process and to induce an active and healthy lifestyle in everyday life ( Komnas Penjasor , 2007).<sup>12</sup> So that problems can be discussed needed monitoring and efficiency , especially strength training program on physical fitness in elementary school ? The purpose of this study is to analyze the need for the monitoring of information about strength development program on primary school children in physical fitness teaching materials.. Review of the literature on this issue resulted in the need for information and monitoring strength training programs on a regular basis and special . This is in line wscott and avery<sup>29</sup> opinion and also Keith Scott Cinea<sup>22</sup> . The importance of determining the form of exercise , intensity , sets , reps are in accordance with the characteristics of children of primary school age ( 7-12 years ) . Able whether Teacher Physical Education accommodates this strength building exercises by an average of 30 students each class? This needs with the technology of computer information systems to help monitor and strength training program with the appropriate composition . This study resulted in the idea of developing software for strength training that can be accessed by teachers and students that are widely useful for the user .

**Keywords:** information systems, strength training. the elementary school child

## **INTRODUCTION**

### **Background**

Physical education can be defined as an educational process aimed at achieving the goal of education through physical movement. Has become a phenomenon that the physical education as an essential substance that education has a significant role to develop the quality of Indonesian human. Traditional physical education tend to emphasize the mastery of sport skills. The approach taken as well as sports training approach. In this approach, the teacher determines the tasks he taught to students through physical activity is like a sports coach. These conditions are not optimal function resulted in the teaching of physical education as a medium of education in order to develop the whole child personally. Lack of effectiveness of teaching physical education in schools. To improve the quality of human resources one needs reliable physical fitness. Physical fitness is a life demands that we are healthy and able to work productively. For the strategic development of physical fitness. because it supports the learning capacity of students and activate the participation of students as a whole are highly preferred since elementary school level. While the development of physical fitness program for elementary schools received less attention in particular. This caused a lot of problems that become an obstacle to the implementation of physical fitness training programs include:

- Advancement of technology pampering learners
- Refinement of open space from development
- Leaders who are less concerned about the environment
- Attitude and family lifestyle.

The phenomenon of "sad" subjects related to the task so easy Physical Education encountered in everyday life as well as in national research reports, such as:

1. The fitness level of our society mean less. Data SDI 2006 states that approximately 37.40% in the category once; 43.90% less; Was 13.55%; Either 4.07%; and only 1.08% either once (Mutohir, Toho Cholik and Ali infallible, 2007: 111) <sup>26</sup>
2. Sedentary lifestyle (sedentary lifestyle) like to linger watching TV, videos, play station, affects about two thirds of children, especially in developing countries (WHO, 2002) <sup>30</sup>.
3. Still no understanding of internal circles maple enjasorkes school that is a lesson that boring, a waste of time and interfere with the child's intellectual development (Suherman, 2004). <sup>23</sup>
4. Still difficult to find the presence of a teacher Physical education around us were competent and successfully manage their subject, so that students love, respect and sincere in following the learning process and to induce an active and healthy lifestyle in everyday life (Komnas Penjasor 2007 ). <sup>12</sup>

So far, efforts to increase physical fitness in elementary school children generally already included in any changes in the national education curriculum by the government, but its implementation has not been programmed in detail by teachers PE as executor. So that these barriers coupled with the lack of clarity in the physical fitness development programs conducted by the School physical education teacher and sports health. This resulted in defective development and growth of learners motion. Not surprisingly found a lot of children who are vulnerable to the disease because of its physical endurance and a lot less awkward in physical activity so active lifestyles will not be realized in its development. Strength is one of the important elements forming physical fitness in general in addition to endurance, speed and flexibility. According to Fox, et al (1988:158) <sup>7</sup>, "muscular strength may be defined as the force of tension a muscle, more Correctly, a muscle group can Exert against a resistance in one maximal effort". This means that the muscle strength as a force or tension a muscle or group of muscles that can be used to hold the load at a maximum effort, Believe the myth that strength training is an activity inappropriate and unsafe for children.

### **Formulation of the problem**

Diversity issues in the implementation of physical fitness program authors found a wide range of problems in a matter of physical fitness for elementary school students ;

- 1 . What is the risk of injury that would be faced by children of primary school age in carrying out programs of physical fitness strength training materials for elementary school students ?
- 2 . Has the advantages and disadvantages of the provision in the material strength training program by teachers Physical educating physical fitness ?
- 3 . Do as the development of computer technology can help summarize the problems in the development of the power of physical fitness program ?

### **A. Purpose**

The primary objective of this study is :

1. to obtain the ideal form of strength training for elementary school students
2. to determine whether the need accurate data in order to develop a strength training program on physical fitness a material achievement of the training program for educators and students .
3. to find effective ways to control the implementation of strength training programs effectively and efficiently to accommodate the achievement of strength training programs and development plans .

### **Benefits**

The benefits that can be taken in this study are :

- 1 . For observers of physical education in gaining empirical evidence related solutions to the obstacles encountered in the process of development , especially the development of the power of student fitness . /
- 2 For practitioners in primary school physical education that particular fitness program development should be monitored strength development.
- 3 . Determining the exact formula for the problems facing the development of strength training especially for primary school children .



### **Contribution to Research**

This study is a literature study on strength training program on children load system in a strength training program Fitness activity objectively , fast and efficient in controlling the development of training students .

### **Growth Characteristics of Primary School Children**

Some references say that the child's physical development for elementary school children aged 7-9 years period sitting in class 1 to class 3 and a period of 10-12 years of age to sit in class 4 to 6 years . Children aged 7-9 years have almost the same physical characters for boys and girls . At this age suitable to teach children basic movement correctly . The average child aged 10 to 12 years of very rapid physical growth include increased bone and muscle mass and composition , in this period many children learn movement skills . In general, ages 7 to 12 years , children tend to be more interested in games and sports competitions that are in accordance with the developmental stage of the child's motor . Play is a form of activity that is very loved by children . Because of this delighted to form a situation that can be used as a vehicle to achieve educational goals . Thus there will be a situation that allows spontaneous , so that the original state of the child will be easily visible ( Sukintaka , 1992: 76 ).<sup>25</sup> Physical education curriculum for elementary school includes a fitness activity as a basis for the development of child movement curriculum . In the matter of physical fitness activities in order to develop strength , the children do not use a heavy burden that would inhibit growth , but how they can hold their own body weight against resistance and light weight .

### **Physical Fitness**

According to M. Sajoto (1988 : 57-59 )<sup>19</sup> components of physical condition is one of the necessary prerequisites in any efforts to improve the athlete's performance , and even can be said to be the foundation of a prefix starting point sporting achievements . The physical condition is a unified whole of components that can not be separated either an increase or maintenance in the sense that any efforts to improve the physical condition , then it must develop all the components. According to M. Sajoto (1988 : 58-59 )<sup>19</sup> The components of the physical condition can be expressed as follows : Strength or strength , durability or endurance, explosive muscle power or muscular power , speed , flexibility , balance, coordination, agility, the precision of accuracy, reaction. After learning that the components of the physical condition , is a unified whole that can be known characteristics of each . So keep in mind then is how to know the status or the state of the physical condition of a student at a time. Status of a person 's physical condition could only be known by measurement and assessment , in the form of test capabilities. Before elaborated on a variety of test capabilities , to complete the knowledge assessment of the status and norms need to know the outline of what the measurement and assessment of it. Measurement and assessment are two issues that will be dependent on each other. Measurement is a collection of information from something that is measured or an act of valuation ( James R. Morrow, 1995:4 )<sup>18</sup> and the result is the data rate measurement results. While the assessment is processing the measurement results , it becomes a more meaningful or also a statement of the value or appreciation of outcome assessment ( James R. Morrow , 1995:4).<sup>18</sup> Measurement is the first step in the assessment, a good measurement and assessment result becomes more precise fixed objective . Assessment depends on the quality of the measurement data entry.

Components of the physical condition of the child who has been known to be used as fill material and information development of motor skills in performing physical activity which also includes material about the development of motor coordination , skill development and mastery of the basic motion of physical activity interests Strength exercises. According Harsono ( 1988:177 )<sup>10</sup> suggests force is the driving force of each sport activity and strength plays an important role in protecting the athlete from possible injury , also will force formed to run more efficiently , hit harder , can also help the stability of the joints. Exercises using muscles that tighten to overcome the resistance generated by the load . The heavier the load , the greater the prisoner . Therefore , muscle strength can be defined as one's ability to exert maximum power to overcome a detainee . Fox and Bower ( 1998:159)<sup>7</sup> There are 4 kinds of muscle contractions in the weight-bearing: (1). Isotonic contraction is a contraction in the weight-bearing muscles change the length of the long form to the shortened form repeatedly.(2). Isometric contraction is a contraction in the weight-bearing with fixed muscle

length.(3).Eccentric contraction is when the muscle lengthens contract changes.(4). Isokinetic muscle tension when it is combined with a constant velocity maximum shorten the trajectory of motion. Stone, WJ and Kroll ( 1988:35 )<sup>20</sup> says differentiate into two types of muscle contraction is isometric and isotonic . Isotonic consists of 3 types of concentric , eccentric , isokinetic. Strength training can be based with the type of muscle contraction through a custody / loading . the motion trajectory . How about giving strength training in children ?

Conceptually physical needs of the child in addition to playing is to channel their excess energy . This will further reduce the risk of injury when equipped with strength training . It aligns the opinion of Wayne Westcott , Avery Faigenbaum<sup>29</sup>. American College of Sports Medicine ( ACSM ) claims , 50 percent of teens who sports injuries can be prevented , in large part, to enroll children in the program in the winter of youth strength ( ACSM 1993 ) . studies have shown a significant increase in muscle strength and mass of boys and girls pre - teen ( Faigenbaum et al 1993; Morris et al 1997; . Pikosky et al 2002; . Westcott et al 1995) . Give the appearance of strength training in sport development , growth and body composition reduces the risk of injury and injury recovery period for both children and adults. But strength training can be at risk of broken bones when the muscles while the one in engineering and not according to the rules.(Blimkie, 1993).<sup>4</sup> For that we need special supervision of teachers Physical educating in strength training provision for primary school children .

## PRINCIPLE FIWT

According to Bompa (1990 : 98 )<sup>2</sup> goals exercise that must be understood is as follows : ( a ) to improve the general physical development ; ( b ) to develop specific physical requirements specified by the sport ; ..... Exercise fatherly devoted to child development at the local muscle strength and strength development in general . Some experts said the type calisthenics Children familiarized do by holding load weight to develop strength such as push ups , pull ups , sit ups , back ups , squats and so on ( sharkey. BJ 1986; Scott and Keith Cinea )<sup>22</sup> . However there who think Dumbledore and the use of rubber elastic , more useful , especially for children who are overweight (Westcott et al. 1995; Faigenbaum et al . 1996)<sup>29</sup> According to Rusli Lutan (2002 : 30-33 )<sup>14</sup> Application principle of overload in strength training should be safe for the safety of the students . To that end , it should be noted that four factors called FIWT principle, stands for :

- Frequency ( F ) ; Frequency is how often a person performing a task or physical activity
- Intensity ( I ) ; Intensity is how hard a person practicing during the training period.
- Time ( W ) ; Time is the length of a implemented activity , and how long it lasts depends on the components of exercise fitness training
- Type ( T ) or distinctiveness of this form of exercise or physical activity undertaken by students to improve their physical fitness components.

The type of strength training for elementary school children through isometric contraction exercises recommended several longitudinal studies .. because at the age of 8-10 years, there is a slightly significant increase in isometric strength (Odde Bar.1996. Stolz.1951 ; Faust 1977)<sup>21</sup> . Form of isometric exercise is to consider the angle and length of the load arm . By holding the arm load for 5 seconds and then rest for 5 or 6 times frequency exercise training 3 days per week ( Pyke FS : 1980 )<sup>12</sup> . According to Fleck and Kraemer.1993 suggested for children form isokinetic exercise with 10-15 reps schemes and 1-3 sets per muscle group . While training begins with the load that can be lifted without any children 10-15 reps muscle fatigue . After that exercise can be improved . The American Academy of Pediatrics (AAP.1990)<sup>1</sup> support the child during strength training program with the monitoring requirements of a good coach and can reach the level of maturity of the child. (Fox.Brower.Foss.1988:176)<sup>7</sup> recommend that pree training be performed 3 or 4 days per week on alternate rather than consecutive days.

## Program Monitoring Function

Physical education teachers must understand the true concept of strength training and then apply it to the practice . Implementation can use simple tools , no need to be tied with standardized tools and expensive equipment. An example , we can create a tool to exercise the power of tin cans filled with cement casting can be made in various sizes . Despite the simple tools have shortcomings in terms of security . Dumbledore learning tool that was created to be strong , safe and appropriate to the child's physical condition and need strict supervision of teachers in the implementation of the exercise

. The child 's own body weight can also be used as a load , for example in the form of strength training, push ups , sit ups , back ups , pull ups , squats . The advantages of this exercise easier to do not need a special tool , but teachers need supervision to display the correct movements and also the possibility of children weighing more need adjustment angle and length of the load arm . To obtain meaningful progress needs special note of each child's development of strength training , some of the things that are important in these records include the following : child initial data ( name , height weight , age , gender , etc. ) , the type of exercise , load , sets , reps , frequency per week training exercise goals and progress consist of a physical test .The function of the physical fitness test in PE teaching programs include (Nurhasan, 2001: 134 ) : 1 )<sup>18</sup> Measuring the physical abilities of students , 2 ) Determine the status of the physical condition of the student , 3 ) Assessing the physical abilities of students as one of the goals of teaching PE , 4 ) Knowing the development of capabilities students' physical , 5 ) As the material to provide guidance in improving physical fitness Here's an example diary strength training program students.

**Table 1. Sample Format Monthly Administration Physical Exercise Program Primary**

Name	:	Sex	:
Birth	:	Beginner arm strength	:
Age	:	Beginner body strength	:
Weight (kg)	:	Beginner leg strength	:
Height ( Cm)	:		

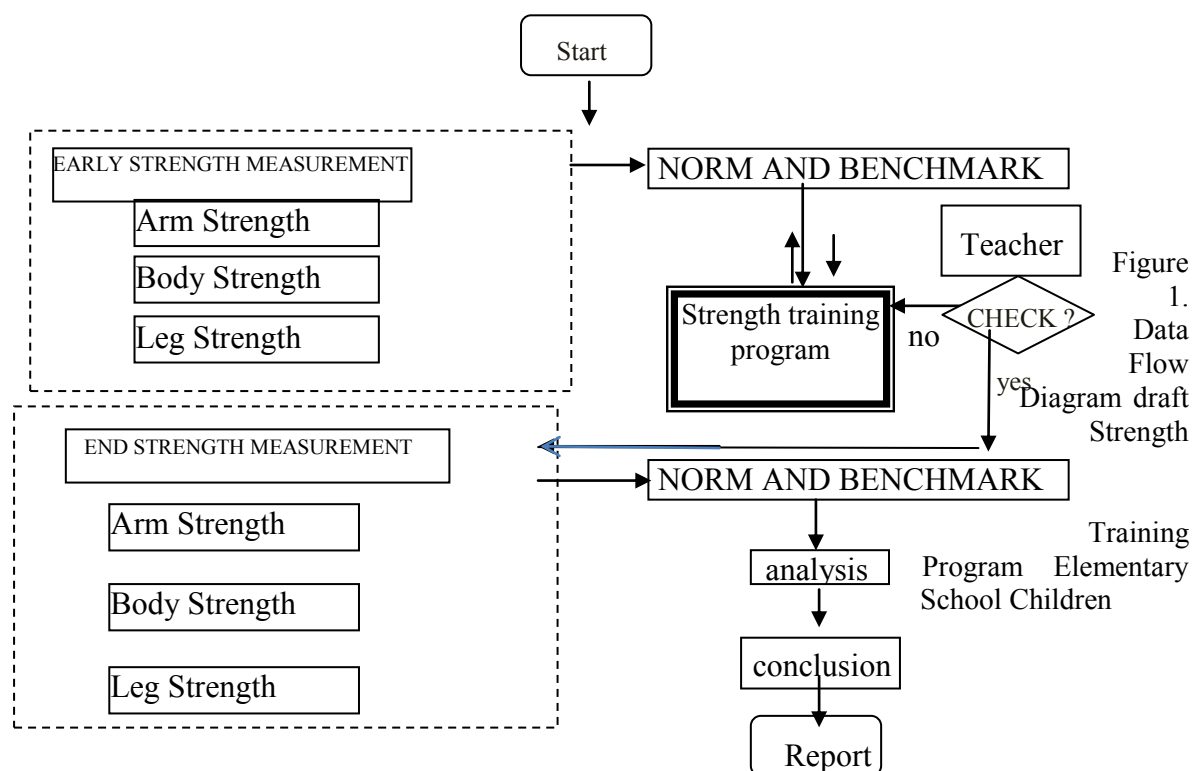
NO	Type of Exercise	Week 1			week 2			week 3			week 4			Information
		1	2	3	4	5	6	7	8	9	10	11	12	
1	Push up													
	/ repetition / set													
	Target /													
2	Sit up													
	Beban/ repetisi / set													
	Target													

## CONCLUSION

Learn from the opinions of many experts that muscle strength and mass in primary school children aged 7-12 years can be improved both sons and daughters ( Faigenbaum et al . 1993; Morris et al . 1997; Pikosky et al . 2002; Westcott et al . 1995).<sup>29</sup> Strength training in children will provide the long term effects and increase the muscle tissue through an increase in protein synthesis . In addition to the effects of strength training can reduce the risk of injury during physical activity . Error factors engineering and safety training tools can cause injuries during strength training not only in children or adolescent even the same . Giving the initial load strength training on elementary school children should not be based on the maximum force would be very vulnerable to injury because of physiological bone and muscle of children still in the soft tissues ( bone , muscle , etc. ) growth . But the initial loading of strength training for children based on the relative strength by measuring a maximum of 10 -15 reps times children can withstand the load . Form of exercise with isometric contraction and type moderate exercise recommended for children grade 1 to grade 3 elementary age 7-9 years whereas type eccentric contraction exercises with low speed grade is recommended for children ages 10-12 years. With using maximum reps times , 1-3 sets . any muscle tissue . Indonesiaan physical education curriculum contains material of physical fitness including strength development . For the Teacher PE responsible and charged with providing the strength training program to students of elementary school . Not be taught exercise program resulted in less bone growth and body composition , as well as students prone to injury during physical activity due to muscle strength to withstand the weight load while moving .

It is necessary for the provision of strength training program with a special observation of the teacher Physical education . Monitoring and evaluation is always given for the development of

strength training is that students can achieve the right direction . Data on students' progress can be properly recorded so that any time a teacher wants increase volume of exercise can be carried out with the dose and the right size . This administration can be effectively implemented with the help of computer technology . So the author get the idea of how all activities program implementation of strength training so that students can be summarized Physical education allows teachers to monitor . Figure 1 below illustrates the flow of data to be taken to obtain data on strength training program on elementary school students :



## SUGGESTION

After reviewing about strength training for elementary school children, the authors provide the following recommendations: [1]. Strength training should have been given to children of primary school age with a dose of proper and strict supervision. [2]. In performing its duties on materials provide strength training fitness Physical educating teachers can use the tools and methods of the results of innovation with safety requirements and in accordance with the characteristics of the students. [3]. The need for teachers PE monitor, monitor and evaluate the progress of students strength training techniques in order to avoid mistakes and injuries as a result of the exercise is not appropriate portions. [4]. Need a computer-based information systems so that teachers, students and parents can work together based on the data and information and culture shaping force fit early.

## REFERENCES

- [1]. American Academy of Pediatrics Policy Statement. Strength, Weight and Power Lifting, and Body Building by Children and Adolescents. Pediatrics. 1990; 5: 801-803
- [2]. Asdep Ordik Kemenegpora RI, Report of PDPJOI .2006. Jakarta: Kemenegpora. 2006.
- [3]. Bompa, O. Todor. *Theory and Methodology of Training Second Edition*. Dubuque, Iowa : Kendall – Hunt Publishing Company.1990.
- [4]. Blimkie Cameron; Oded Bar. *Trainability of Muscle Strength, Power and Endurance during Childhood* .IOC, Blackwell Science.1996
- [5]. Fleck, S.J., Kraemer, W. J. *Strength Training for Young Athletes*. Champaign, IL: Human Kinetics, 1993

- [6]. Fox, E.L. Mathew, DK, The Physiology Basis of Education and Athletics Philadelphia, Ssanders College Publishing.1981.
- [7]. Fox,EL. Bowers,RW. Foss,ML. The Physiology Basis of Education and Athletics,Philadelphia, Ssanders College Publishing.1988.
- [8]. Hurlock, Elizabeth B. *Perkembangan Anak*. Jakarta : Erlangga 1979.
- [9]. Harre, Dietrich. Principles of Sport Training. Berlin Sportverla.1982.
- [10]. Harsono. Coaching and In Psychological Aspects of Coaching. C.V. Tambak Kusuma. (1988).
- [11].Jack K. Nelson & Barry L. Johnson *Practical Measurements For Evaluation In Physical Education*. Department of Physical Education for WomenUniversity of Minnesota. 1969.
- [12].Kelompok Kerja Komnas Penjasor. Report ICHPER-SD and UNESCO about Global Mission Physical Education in Schools. Jakarta. 2007.
- [13].Lamb, David R. Phsycology of Exercise Respon and Adaptation.New York : MacMilan Publishing Co.1984.
- [14]. Lutan Rusli. Towards Healthy and Fit. Jakarta: Depdiknas Ditjen Dikdasmen.2002
- [15]. Lutan Rusli. Principles of Physical Education: Motion Education Elementary school approach. Dasar. Jakarta: Departemen Pendidikan Nasional. 2002.
- [16]. Magill, Richard. *Motor Learning Concept and Application Third Edition*. USA : By WM. C. Brown Publishers. 1980.
- [17]. Morrow, James R. *Measurement and Evaluation in Human Performance*. USA : Human Kinetics. 1995
- [18].Nurhasan. Tests and Measurements in Physical Education Principles and Practice.Jakarta: Direktorat Jenderal Olahraga.2001.
- [19].Sajoto M. *Sports Development in the Physical Condition*. Jakarta: Depdikbud . 1988.
- [20].Stone, WJ. Kroll, WA. Sport Conditioning and Wight Training.C brown Publishing.1988
- [21]. Odde Bar. *The Child and Adolescent Athlete*. IOC Blackwell Science.ltd.1996
- [22]. Scott & Keith Cinea. [https://creightonprep.creighton.edu/uploaded/Athletics\\_Page/Weight\\_Room/Lifting/](https://creightonprep.creighton.edu/uploaded/Athletics_Page/Weight_Room/Lifting/) / asscesed 2004-3-31 at 08.00 WiB
- [23]. Suherman, Wawan. The Importance of Physical Education for Children. <http://www.matabumi.com/pendidikan/perlunya-pendidikan-jasmani-bagi-anak>. 2007.
- [24]. Sugiyanto . *Development and Learning of Motor*. Jakarta : Depdikbud.1997.
- [25]. Sukintaka. Theory Playing For PGSD D2 PE. Jakarta: Direktorat Jenderal Pendidikan Tinggi 1992.
- [26].Toho Cholik Mutohir dan Ali Maksum. *Sport Development Index*. Jakarta: PT. Indeks. 2007.
- [27]. Pyke Franks S. *Towards Better coaching (The art and Science of coaching*. Australian Government Publishing. 1980
- [28]. Winarno Surakhmad, *Didactic Teaching Methodology*. Bandung : Jemmars.1986.
- [29]. Wyne & Avery . <http://www.ideafit.com/fitness-library/strength-training-for-kid> asscesed 2004-3-31 at 08.00 WiB
- [30]. WHO. *The world report.Reduce risk of promoting healthy life*. [http:// whqlibdoc.who.int/publications/2002](http://whqlibdoc.who.int/publications/2002) asscesed 10 -4-2014 at 23.00 WIB

# THE THEORY OF ACHIEVEMENT MOTIVATION ELLIOT MODEL IN A PHYSICAL EDUCATION

Siti Hajar

Tunas Pembangunan University, Indonesia

sitihajar\_s3bk\_upibaru@rocketmail.com

h.siti@ymail.com

## Abstract

Achievement motivation Elliot Model is achievement motivation theory to the field of education and Physical Education. Encouragement to succeed with avoidance of fear of failure (FF or fear of failure). The theory is called Elliot trichotomus model approach and avoidance achievement motivation. The main characteristic of which is 2 x 2 achievement motivation Elliot Model is expectation both in approach and avoidance goals (approach and avoidance) and definition of competence (mastery-performance). Achievement motivation in sports more emphasized on effort avoidance fear of failure (FF) rather than happiness in success of the approach. Fear of failure is the most frequent cause in sports competitions. Achievement motivation in sport can't be measured in terms of cognitive, but the impact of goal achievement will be seen from physical activity. The study aimed to know the theory of achievement motivation in a physical education. Research carried out with library research to basic technical in the Analysis of the data in this study: Mixed Methods (Qualitative-Quantitative)

**Keywords:** trichotomus Elliot model, approach, avoidance, achievement motivation

## INTRODUCTION

Murray motivation theory beginning motivation psychological. Henry A Murray is professor of clinical psychology from Harvard University. Achievement motivation is an encouragement to meet the need for achievement. Human needs begins types of opinions Murray. Needs type of Murray in Introduction to Theories of Personality Hall, Calvin S., and Lindzey, Gardner: 1) n Aba (need abasement); 2) n Ach (need achievement); 3) n Aff (need affiliation); 4) n Agg (need aggregation); 5) n Auto (need autonomy); 6) n Dom (need dominance); 7) n Nur (need nurturance); 8) n Suc (need succorance). Murray on Introduction to Theories of Personality, Hall, Calvin S., and Lindzey, Gardner (1985:317) achievement (n Ach) to accomplish something difficult; to master; to overcome obstacles and attain a high standard; to rival and surpass others. McClelland's Achieving Society, as the inventor and expert achievement motivation, motivation models that try to explain how to predict the behavior and performance of the need for achievement.

Individuals who high achievement motivation have a moderate degree of risk to get success. Difference about expectation of hope of success (HS) and fear of failure (FF) in achieving a goal, as a form of challenge in achieving the need for achievement. Individuals have behavioral achievement motivation to maximize individual to succeed, and to minimize the possibility of failure. Pang's (2006), Heckhausen's (1963) and McClelland et al.'s (1953) in Oliver C. Schultheiss, Joachim C. Brunstein (2010:88) "measures taken together, the subcategories for HS suggest a profile of the prototypical HS-motivated individual as a person who pays greater attention to positive achievement standards as well as to any indications that a positive achievement goal has been obtained (as indicated by the emergence of the themes of positive achievement goal, successful outcome, significant accomplishment, and praise)".

Stevenson (2011:p.13) research on achievement motivation using both classical approaches (for example, Atkinson, 1957, Lewin, 1935, McClelland, 1951) the classic approach also contributes important antecedents of goal adoption like need for achievement and fear of failure or contemporary approaches (eg, Ames, 1984; Dweck, 1986; Nicholls, 1984, 1989) the contemporary approach examines goal orientation as a global motive disposition". Elliot (1999, p. 169) in Stevenson definition

achievement motivation "as the energy and direction of competency-based affect, cognition, and behavior, the purpose of which is thought to affect how individuals interpret and experience achievement settings such as education and activity settings physical".

Kumar, R And Deepla,K (2011:28) "achievement Motivation defined as the need to perform well or the striving the success as the need to perform well or the striving for success and evidenced by persistence and effort to achieve high performance in sports ...". A situation of competitive conditions make a achievement motivation in sport. Competition is core of achievement motivation. Achievement motivation will be awakened from the atmosphere is a competition. Atmosphere of competition that begins the training process until the actual sports competitions, we can make a benchmark achievement.

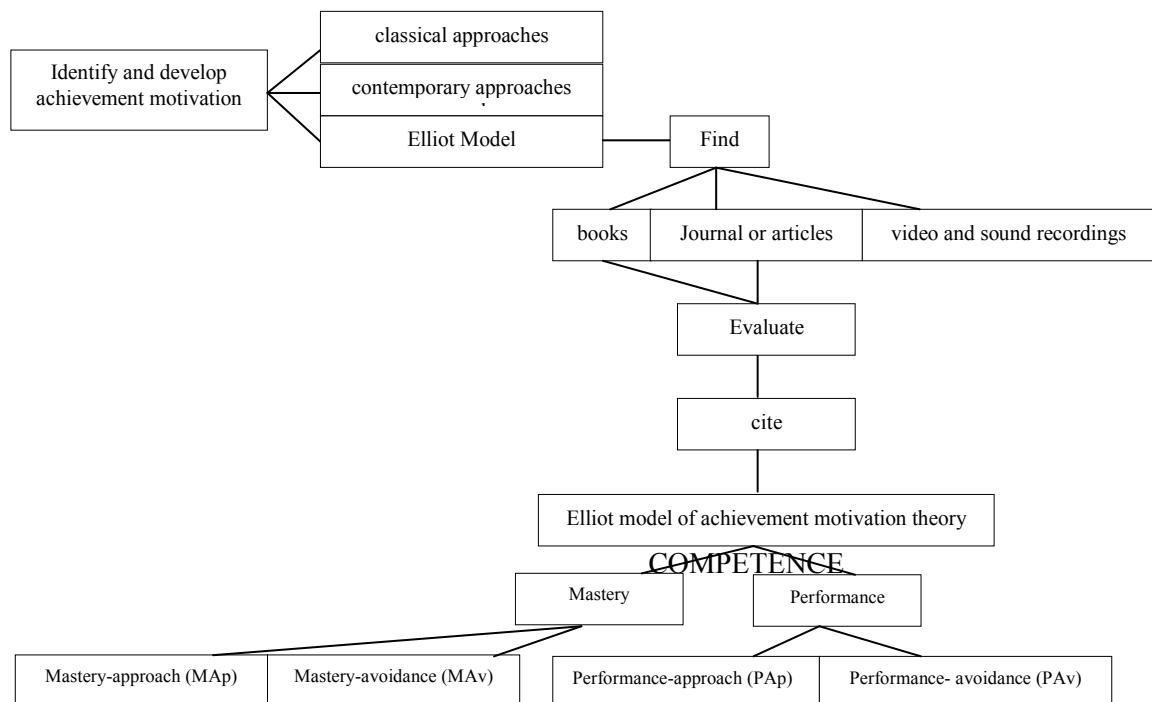
Achievement motivation in sport research has been done in Indonesia tend to use the approach in other areas, for example, using the model of McClelland in which this approach is more appropriate when used in the field of economics. The use of benchmarks in other fields to measure achievement motivation in sport, of course the results are less than the maximum given coaching sports achievements more emphasis on education and physical activity. From this, we see that the theory of achievement motivation Elliot has advantages because the model is very applicable applied in the field of education and physical. Introduction to the theory of achievement motivation Elliot required as appropriate renewal theory in the field of sports. Now, achievement motivation at the two sides of education and physical activity as a whole. The theory of achievement motivation elliot model in a physical education.

## RESEARCH METHOD

The theory of achievement motivation elliot model in a physical education are section desertation research "**Pengaruh Konseling Singkat Berbasis Solusi (*Solution-Focused Brief Counseling/SFBC*) Terhadap Motivasi Berprestasi (Studi *Sequential Exploratory Design* Pada Mata Kuliah Pembinaan Prestasi Olahraga)**". Research carried out with library research to basic technical in the analysis of the data in this study: Mixed Methods (Qualitative-Quantitative). Research library is important to find the source libraries, journals /articles, documents needed to support and build the basic theory of achievement motivation in sport.

Engle (2014) library research in Cornell University "seven steps to effective library research are 1) identify and develop your topic; 2) find the context: background information on your topic; 3) find books; 4) find periodical articles; 5) find video and sound recordings; 6) evaluate what you find; 7) cite what you find". (<http://guides.library.cornell.edu/sevensteps>). Explanation of step in this library research :

- 1) Identification and development about achievment motivation theory and applicated in sport or a physical education.
- 2) find the context: background information about achievment motivation theory, classical approaches, contemporary approaches and Elliot model.
- 3) find books about achievment motivation theory : handbook of approach and avoidance motivation/ Elliot, Andrew J.
- 4) find periodical articles about achievment motivation theory : Elliot (1997,1999,2004,2006), Stevenson (2011)
- 5) find video and sound recordings about Elliot model of achievement motivation theory:
- 6) evaluate what you find about Elliot model of achievement motivation theory.
- 7) cite what you find about Elliot model of achievement motivation theory.



**Figure1: Cornell Library research diagram Elliot model of achievement motivation theory**

## RESEARCH RESULT AND DISCUSSION

### Result Library research

- 1) find books and find periodical articles about achievement motivation levels classical approaches, contemporary approaches, Elliot Model Levels in dividing achievement motivation in sport is discussed by several experts, among others: a view based on the involvement of the state, grouping athletes, age athletes, as well as approach and avoidance motivation, Elliot (1999). Besides grouping achievement motivation as a support in facilitating the achievement of sports coaching program planning.
  - a) Glyn C. Roberts, Darren C. Treasure, and David E. Conroy in Gershon Tenenbaum and Robert C. Eklund, eds (2007:13) “stated that achievement motivation is based on a hierarchical view of the dynamic state of the achievement of the goal achievement is influenced by (1) stable individual differences (such as motive, self-perception, variable rational basis, neurophysiologic predispositions; Elliot, 1999); (2) situational variables (eg, motivational climate; Ames, 1992c; Ames & Archer, 1988). The state has a major role in determining and implementing performance goals will be achieved by athletes as a national sports destination.
  - b) Nicholls' (1984) on the theory of goal or achievement orientations, divides the age of the athletes on the basis of the task and ego orientation. Nicholls' (1984) in Jarvis, Matt (2006: 142), namely (1) the child, based on the orientation of the performance assessment tasks according to their efforts, meaning that when they've worked hard to do the job, they have done their best thinking. Ego orientation based on their success over the age counterparts (mutually exclusive). (2) Adult, task orientation information through a variety of past experiences and the experiences of others in giving directions to assess our competence. Task and ego orientation are not mutually exclusive and can exist in the same person. Some athletes have the temporary basing on performance
  - c) McArdle, Duda, and Hall, (2004) in Elliot, J,A and Dweck, S. Carol (2005:330) divides athletes into 4 groups: the first group was task orientation and high ego, the second group is characterized by high task orientation and orientation low ego, high task orientation third group coupled with moderate ego orientation, while the fourth group has the character of low task orientation and ego orientation was. A strong desire to achieve one's sporting achievements will determine the seriousness of an athlete in training and coaching programs perform tasks in sport achievement will affect the performance of athletes when competing.



- 2) find books and find periodical articles about Elliot model of achievement motivation theory in Handbook Of Approach And Avoidance Motivation, Elliot, J.A (2008:8) definition of approach and avoidance motivation: Approach motivation may be defined as the energization of behavior by, or the direction of behavior toward, positive stimuli (objects, events,possibilities), whereas avoidance motivation may be defined as the energization of behavior by, or the direction of behavior away from, negative stimuli (objects,events,possibilities).  
Elliot, J.A (2008:8-9) conceptualization approach–avoidance motivation, such as:
  - (a) being a motivational distinction, approach–avoidance encompasses both the energization and direction of behavior;
  - (b) inherent in the approach–avoidance distinction is the concept of physical or psychological movement;
  - (c) implicit in the aforementioned point is the notion that movement toward a positive stimulus and movement away from a negative stimulus each has two distinguishable forms;
  - (d) positive or negative valence is construed as the conceptual core of the approach–avoidance distinction;
  - (e) “stimuli” as used herein may represent concrete, observable objects/events/possibilities, or they may represent abstract, internally generated representations of objects/events/possibilities;
- 3) find books and find periodical articles about Elliot model of achievement motivation theory in Elliot’s (1999) 2 X 2 Model Of Achievement Motivation: A Meta analysis Of The Empirical Literature In Physical Activity And Education, Adapted from “A 2 x 2 Achievement Goal Framework” by A. J. Elliot & H. A. McGregor, 2001, Stevenson (2011:12) definision as mastery (absolute, intrapersonal competence), performance (normativen competence) approach (striving for competence), avoidance (striving away from incompetence).

Evaluation and cite from books and articles about Elliot model of achievment motivation theory, aothority, usefulness, and reliability of the information about Elliot model of achievment motivation theory.

## Discussion

The development of the theory of achievement motivation in the field of sports to change, where the initial achievement motivation as an encouragement to meet the needs of achievement preformance achieve the expected goals. Achievement motivation is only seen from the side in terms of mastery of cognitive to contributes important antecedents of goal adoption like need for achievement and fear of failure,develops looked examines the motivation of goal orientation as a global motive disposition. Physical activity into the activity exercised less considered. From this model the emergence of achievement motivation Elliot. Elliot which takes into account the appropriate mastery and performance benchmarks used in education and physical activity.

Theory of achievement motivation are often called elliot model of approach and avoidance trichotomus achievement motivation.Achievement motivation of Elliot (1999) called the 2 x 2 achievement motivation or trichotomus Elliot model. Elliot, J.A and Conroy, E.D (2004:273) “Elliot (1997), motive and goal approachesto achievement motivation have complementary strengths and limitations...”. Achievement motivation in sport can’t be measured in terms of cognitive effects of goal achievement but will be visible from physical activity. Approach and avoidance to goal achievement will be seen from the behavior of individual achievement.The main characteristics of achievement motivation in Elliot is hope (valence) both in approach and avoidance goals (approach and avoidance) and the definition of competence (mastery-performance).

## COUNCLUSION AND SUGGESTION

The conclusion of this study in the first phase with library research, the presence of base and foundation theory of Achievement Motivation Model Elliot in a Physical Education, achievement motivation in accordance in education and physical activity that mastery and performance in

approach–avoidance motivation. From this, the research dissertation Sequential Exploratory Design techniques (qualitative-quantitative), will be followed through to build and design a hypothetical model and design of SFBC as a hypothetical model that is appropriate counseling approach to coaching and the game sporting achievements both before and during the match, one only in overcoming the problems from achievement motivation Elliot Model. Then, proceed with the SFBC is necessary to test the model in the field, the quantitative analysis techniques, the effectiveness of the model SFBC to Elliot Achievement Motivation Model. Appropriate dissertation title “**Pengaruh Konseling Singkat Berbasis Solusi (*Solution-Focused Brief Counseling/SFBC*) Terhadap Motivasi Berprestasi (Studi *Sequential Exploratory Design* Pada Mata Kuliah Pembinaan Prestasi Olahraga)**”.

## REFERENCES

- Elliot, J.A and Dweck, S. Carol. (2005). Handbook of competence and motivation / foreword by Martin V. New York : The Guilford Press
- Elliot, J.A and Conroy, E.D. (2004). Fear Of Failure And Achievement Goals In Sport: Addressing The Issue Of The Chicken And The Egg, *Journal Anxiety, Stress, and Coping*, September 2004, Vol. 17, No. 3, pp. 271-/285. Brouner Routledge Taylor & Francis Health Science. [www.psych.rochester.edu](http://www.psych.rochester.edu) (Diakses: 15 April 2012)
- Elliot, J.A. (2008). Handbook of Approach and Avoidance Motivation. New York: Psychology Press Taylor & Francis Group.
- Elliot, A. J. & Church, M. A. (1997). A Hierarchical Model of Approach and Avoidance Achievement Motivation. *Journal of Personality and Social Psychology*, 72, 218- 232 (Diakses: 15 April 2012)
- Elliot, A.J. and McGregor, H.A (1999). Test Anxiety And The Hierarchical Model of Approach and Avoidance Achievement Motivation. *Journal of Personality and Social Psychology*, Vol.76, 628-/644 (Diakses: 15 April 2012)
- Elliot, A. J. (2006). The hierarchical model of approach–avoidance motivation. *Motivation and Emotion*, 30, 111–116. (Diakses: 15 April 2012).
- Engle, M.(2014). Seven Steps to Effective Library Research. <http://guides.library.cornell.edu/sevensteps> (Diakses: 5 April 2014)
- Gershon Tenenbaum and Robert C. Eklund. (2007). Handbook of Sport Psychology, Third Edition. New Jersey: Wiley.
- Hall, Calvin S., dan Lindzey, Garder. (1985). Introduction to Theories of Personality. New Jersey: John Wiley and Sons.
- Jarvis, Matt. (2006). Sport psychology : a student’s handbook. New York: Routledge
- McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1953). The achievement motive. New York: Appleton-Century-Crofts
- Oliver C. Schultheiss, Joachim C. Brunstein. (2010). Implicit motives. USA: Oxford University Press
- Kumar, R And Deepla,K.(2011). A Comparative Study Of Achievement Motivation Among Individual Game Sports Persons And Team Game Sports Persons, Vol. 1, No. 1, Quarterly March 2011, *International Journal of Health, Physical Education and Computer Science in Sports*, p.28-30. Indian : [www.ijhpecss.org](http://www.ijhpecss.org) (Diakses: 15 April 2012)

Stevenson, J.S. (2011). *Elliot's (1999) 2 X 2 Model Of Achievement Motivation: A Metaanalysis Of The Empirical Literature In Physical Activity And Education*, p.i., A Dissertation In Educational Psychology Texas Tech University <https://repositories.tdl.org/ttu-ir/handle/2346/ETD-TTU-2011-05-1492> (Diakses: 15 April 2012)

# OUTCOME-BASED EVALUATION OF KASETSART UNIVERSITY STUDENTS PARTICIPATED IN OUTDOOR EDUCATION CAMP PROGRAM

Suvimol Tangsujjapoj

Kasetsart University, Thailand  
*fedusut@ku.ac.th*

## Abstract

The purpose of this survey research was to investigate students' outcomes after attended one-week outdoor education camp at Wanagon National Park during 12-18 October, 2013. Subjects were 75(52 males, 23 females) undergraduate students who took the course "Outdoor Education and Camp" in the first semester of 2013 academic year. The research instrument was a self-administered questionnaire. The content validity (IOC) was in the range from .66 to 1. The reliability of Alpha coefficient by Cronbach method was .91. The questionnaires were collected before and after attended outdoor education camp. Data were analyzed by mean, standard deviation, and t-test. Results showed that student outcomes increased significantly from pre-to post-outdoor education camp in family citizen behavior, friendship skill, responsibility, team work, independence, perceived competence, affinity for exploration, affinity for nature, problem-solving confidence, camp connectedness, outdoor living skills, and outdoor safety awareness at statistical level of .05. However, there was no significant difference in statistic in the item of spiritual well-being. It can be concluded that outdoor education camp enhanced students' change in knowledge, attitude and behavior occurred through experience-based learning.

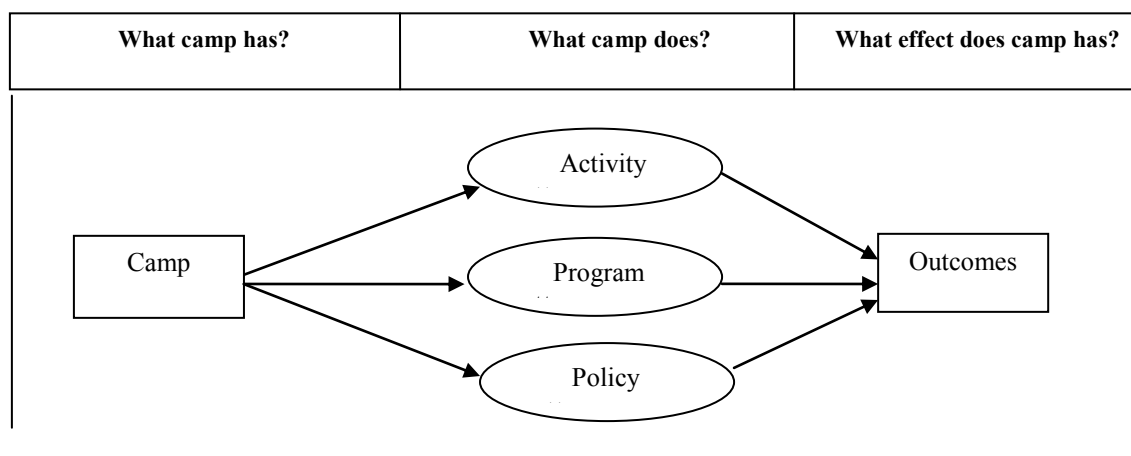
**Keywords:** outcome-based evaluation, student, outdoor education camp

## INTRODUCTION

Outdoor education is education in, for, and about the outdoors (Ibtahim & Cords, 2002). It which grew out the school camping movement of the 1920s and 1930s in USA, in cooperated components of nature study and conservation education into experience-based outdoor learning (Hammerman, 1980). Outdoor education was promoted as both a method and an area of study. As a method, outdoor education did not seek to replace other subjects, but rather advocated for the use of the outdoors to enhance school curriculum. As a subject area, outdoor education placed emphasis on relationships between people and nature utilizing outdoor, experiential learning (Priest, 1986). In addition, Wals, et al (2008) identified two types of learning in outdoor education: emancipator learning focused on personal growth and instrumental learning focused on environmental behaviors. Two outdoor educations have emerged manifesting these types of learning: outdoor environmental education, focusing on specific environmental issues or scientific fieldwork, and adventure education, focusing on physical skills, technical skills, personal and social developmental through challenging situations (Cooper, 1999).

Outdoor education programs tend to have positive impacts on typically measured outcome such as self confidence and teamwork skill (Hattie et al, 1997). The goals of camp are human growth and development. Organizing camping is an educational experience and value of camps as providers of experiential learning environments. It is experiences in group living in outdoors that trained leaders to accomplish intentional goals. Meanwhile experiential learning is a cyclical and holistic process of continual transactions between the learner and his/her environmental (Roberts, 2003). Residential camp experiences have traditionally focused on helping campers reach new skill levels in a variety of areas (Henderson et al, 2007). Camp and outdoor school program provide unique learning experiences for youth that cannot be replicated in the classroom. However, there was not been substantial research to prove or disprove the various claims that outdoor experiences develop, among other things, self-reliance, self-esteem, and social growth among campers and students.

Department of Physical Education, Kasetsart University has offered the course “Outdoor Education and Camp” for 30 years, including a day camp program, and a-week resident educational environmental-centered camp program for the first year students, majoring in physical education. Since outdoor education as an experiential discipline focused on “education in, about, and for the outdoors”, the goals of which include “an awareness of and respect for self, others and the natural environment” (Wattchow, 2004). Meanwhile the outdoor education program provides valuable experiences for students to learn concepts about nature while in nature. Moreover, retrospective studies have shown that children’s outdoor experiences predict their environment responsible behaviors in adulthood (Wells & Lekies, 2006). The concept of the subject “Outdoor Education and Camp” is the more intervention to various activities and programs in the outdoor education camp, the better outcomes effect on campers. Fig. 1 presents the conceptual framework of the subject “Outdoor Education and Camp”.



**Figure 1. Conceptual framework of the subject “Outdoor Education and Camp” of Kasetsart University**

In the past, Kasetsart University outdoor education camp program focused on satisfaction of the participants, rather than concentrating on how well program objectives and outcomes were being met. Therefore, outcome-based evaluation of outdoor education camp program will demonstrate not only whether or not something’s working, but also what is working best and what may need improvement. According to Henderson et al (2007) pointed out that further camp research is necessary to add to a growing knowledgebase, including research related to the value of the outdoor for children and youth. Research and evaluation can play a major role in contributing to the understanding and knowledge regarding the positive impact of outdoor programs on the development of youth (e.g., campers, students). Evaluation is an important step in the camp process, yet so many organizations do not put in the effort required to evaluate their camp appropriately. There is no single way to evaluate a camp program (Moffitt, 2011). Program evaluation provides feedback of staff and campers. Feedback from staff will help measure the success of the processes, plans, and protocols of the camp. Feedback from campers gives them a sense of ownership of their camp experience. Outdoor education camp faces increasing pursue to be evidence based. The development of sound evidence outcome/experience into outdoor education and practice are seen as essential to the profession of recreation curriculum of students at the Department of Physical Education in Kasetsart University.

#### **Purpose**

The purpose of this study was to investigate students’ outcomes after attended one-week *outdoor education camp program*.

## Literature Review

Outdoor education has been described as a method for highlighting embedded, interdisciplinary curriculum concepts as well as character qualities within the teaching of outdoor recreation activities (Bunting, 2011). It is characterized as a learning climate that provides opportunities for direct laboratory experiences related to the identification of and solutions for life problems, as integral to the education process in being a curriculum extension and enrichment versus a separate curriculum, and as broad concept encompassing a wide range of learning experiences extending outward from the classroom (Smith et al, 1972). More recently, ERIC (2000) characterizes outdoor education as “the use of features of the natural environment for instruction in school or school program, includes residential and day camps, adventure education, and curriculum and instructional methods for experiential learning generally”. Outdoor education is actually comprised of three dimension-extension, content, and teaching method (Bunting, 2011).

The first dimension of outdoor education is the process of extending structured learning activities beyond the classroom into the community, natural environment, and other locations of topics being studied.

The second dimension of outdoor education is the content, or what is being taught. The content can include information about the natural environment and its relationships, specific skills to be used in the outdoors, or our relationship with environment and how our activities as individuals and as a socially affect it.

The third dimension of outdoor education is teaching method. Outdoor education is a method that uses activities as a means for developing skills and understanding concepts in a variety of subjects. This method typically uses activities to highlight connections and initiate reflective discussions and journaling. Outdoor education as a teaching method links the cognitive, affective, and psychomotor domains of learning. Factors which influence effects of outdoor education programs (Neil, 2007) are:

1. Individual differences –gender, age, personality, readiness for change, etc.
2. Organizational philosophy and culture.
3. Experiential concrete, consequential problem-solving tasks.
4. Dramatic activity in novel context
5. Theory-based, principle-driven, customized program structure.
6. Carefully selected and trained leaders.
7. Facilitation techniques.
8. Group development processes and dynamics.
9. Program for transferability, including significant other, exploring personal stories and metaphoric thinking.
10. Length of program.
11. Environmental and logistical events.
12. Program modality.

The American Camping Association (1990) describes camping as “a sustained experience that provides a creative, recreational and educational opportunities in group living in the outdoors. It utilizes trained leadership and the resources of the natural surroundings to contribute to each camper’s mental, physical, and spiritual growth”. Camps provide a sustained, group living experience in an outdoor setting and utilize the resources of the natural surroundings to contribute to each camper’s mental, physical, social and spiritual growth (Coutellier, 2002). In other word, camp is a unique and valuable setting for positive youth development outcomes (Garst, Browne & Bialeschki, 2011). Camps provide an exceptionally strong environment in which young people develop supportive relationship with adults that offer guidance and emotional and practical support (ACA, 2006). Core competencies in camping (ACA, 2010) are:

1. Youth and adult growth and development.

2. Learning environment and curricula
3. Program planning.
4. Participant observation, assessment, and evaluation.
5. Professionalism and leadership.
6. Health and wellness.
7. Risk management.
8. Cultural competency.
9. Families and community connections.
10. Nature and environment.
11. Business Management and practices.
12. Competency content area.
13. Human resources management.

Camp is more than a location or a program; it includes what happens to youth during and after the Camp experience. Camp participation has been found to affect youth in multiple ways, enhancing many forms of growth, including: 1) affect (self-esteem and self concept), 2) cognitive (knowledge, skills, abilities, and attitudes), 3) behavioral (self-reported behaviors and behavioral inventions), 4) Physical, 5) social, and 6) Spiritual (Garst & Bruce, 2003). Life skills in the youth camper include being, relating, caring, thinking, giving, and working (Hendricks, 1998).

The American Camping Association (2005) recommends a counselor-to-camper ratio not exceeding 1:15. For facility-based day camp, a ratio of 1:10 is recommended to reduce risk, increase supervision, and provide a high standard of care. Staff-facilitated games and activities need to be fair, safe, fun and age appropriate.

The following review of literature will discuss previous research on outdoor education and camp. Dresner & Gill (1994) studied a two-week camp experience, participants showed greater comfort in the outdoors, greater interest in outdoor activities, increased awareness of environmental issues, and increase enthusiasm about and awareness of things in nature (Self-esteem also increased significantly by the end of the camp experience).

Natural Environmental Education and Training Foundation (NEETF, 2001) research showed that youth development that includes character attributes has emerged as a high priority, with extensive efforts being expended to identify, confirm, and measure desired outcomes for youth through research and evaluation. Evidence showed that many youth programs support the development of teamwork (Larson et al, 2005), and camp improved skills tied to teamwork (Garst & Bruce, 2003).

The American Camping Association (2005) conducted a multi-year study to identify and measure summer youth program outcomes. Results showed that youth development in several domains, including independence, self-esteem, confidence, social skills, exploration, and spirituality. No differences were found that based on the camp type (day, resident) or session length. In addition, the study indicated that camp is a unique educational institution and a positive force in youth development. The camp experience can benefit in children by increasing:-confidence and self-esteem, social skill and making friends, independence and leadership qualities, willingness to try and adventurousness, and spiritual growth, especially at camps focused on spirituality

Research of the Outdoor Industry Foundation (2005) revealed that strong participation in camping (away from car) during 2004 resulted in a total of 105 million outings. Camping (away from car) activity continues to be driven by young Americans -one half (47%) of the 2004 participant population is between the ages of 16 and 24.

Ballantyne & Pacher (2009) found that the most effective learning experiences in natural environment-learning that encompassed changes in knowledge, attitudes, and behavior-occurred through experience-based rather teacher-directed strategies

Outdoor Foundation (2010) study showed that 15.7 million of American participants (ages 18-24) in outdoor activity in 2009. Most popular outdoor activities by participation rate (age 18

to 24) in: - running and jogging, car, backyard and camping, fresh water, salt water and fly fishing, road biking and mountain biking, and hiking. Most influenced (aged 18-24) to participate in outdoor activities is friends Relaxation is the top motivator for young adult (18-24) to participate in outdoor activities. Lack of times is the number one reason youth at ages 18-24 don't participate in outdoor activities more often..

Summary: Outdoor education has a multitude of objectives, some of which include: to help people live in harmony with the natural environmental, to establish a basic understanding of others, to utilize an interdisciplinary approach to education, to learn to use all of the senses, to learn in the natural curiosity of student.

## RESEARCH METHOD

The research instrument was a self-administered questionnaire. It was designed from youth benefit of Youth Outcome Battery of American Camping Association (ACA, 2005). The survey questionnaire consisted of 13 outcomes: Family Citizenship Behavior in camp (FCB), Friendship to camp members (FS), Responsibility to camp work (RESP), Team Work (TW), Independence (IND), Perceived Self-competence (COMP), Affinity for Exploration (AE), Affinity for Nature (AN), Problem-solving Confidence (PSC), Camp Connectedness (CC), Spiritual Well-being (SWB), Outdoor Living Skill (OLS), and Outdoor Safety Awareness (OSA). The content validity of the questionnaire was approved by 5 leisure experts. The Index of Congruence was in the range from .66 to 1. The reliability of Alpha coefficient (Cronbach method) which collected from 30 students was .91. The content validity and reliability of the questionnaire were shows in Table 1.

**Table 1. Subscale Content Validity (IOC) and Reliability (Cronbach's Alpha) of the questionnaire**

Subscale	IOC	Mean	Standard Deviation	Cronbach's Alpha	Numbers of Items
1. Family Citizenship Behavior (FCB)	.66	2.96	.75	.91	1
2. Friendship to camp members (FS)	1.00	3.21	.72	.90	1
3. Responsibility to camp work (RESP)	1.00	3.96	.75	.90	1
4. Team Work (TW)	1.00	3.04	.91	.89	1
5. Independence (IND)	.80	2.79	.88	.91	1
6. Perceived Self-competence (COMP)	.80	3.00	.72	.91	1
7. Affinity for Exploration (AE)	1.00	2.87	.85	.90	1
8. Affinity for Nature (AN)	1.00	3.12	.85	.90	1
9. Problem-solving Confidence (PSC)	.80	2.79	.79	.90	1
10. Camp Connectedness (CC)	.80	2.79	.83	.90	1
11. Spiritual Well-being (SWB)	1.00	2.54	.93	.92	1
12. Outdoor Living Skill (OLS)	1.00	2.58	.83	.90	1
13. Outdoor Safety Awareness (OSA)	1.00	2.96	.86	.90	1
Total	.66-1.00	2.79	.82	.91	13



The data for this survey research was collected from 75 undergraduate students majoring in physical education, including 52 males and 23 females. Data were analyzed by using mean, standard deviation, and t-test.

## RESEARCH RESULTS AND DISCUSSION

### Results

Students participated in outdoor education camp were 69.33 % in male, and 30.67 % in female. They took the course “Outdoor Education and Camp”, as well as had at least a Day Camp experiences prior attended the outdoor education camp. Findings showed that student outcomes increased significantly from pre-to post-outdoor education camp in family citizen behavior, friendship skill, responsibility, team work, independence, perceived competence, affinity for exploration, affinity for nature, problem-solving confidence, camp connectedness, outdoor living skills, and outdoor safety awareness at statistical level of .05. Among these 12 outcomes, three priorities highest mean different scores between pre-and post-attended the outdoor education camp were outdoor living skill (1.33), outdoor safety awareness (1.26), and team work (1.070; the lowest mean different score was independence. However, there was no significant difference in statistic in the item of spiritual well-being (see Table 2).

**Table 2**  
**Testing differences between before and after attended outdoor education camp program.**

N = 75

No	Items	Mean before	Mean before	Mean Different	Sig
1	Family Citizenship Behavior (FCB) in camp	2.75	3.65	0.90	.000*
2	Friendship to camp members (FS)	2.81	3.81	1.00	.000*
3	Responsibility to camp work (RESP)	2.75	3.68	0.93	.000*
4	Team Work (TW)	2.72	3.79	1.07	.000*
5	Independence (IND)	2.88	3.39	0.51	.000*
6	Perceived Self-competence (COMP)	2.68	3.67	0.99	.000*
7	Affinity for Exploration (AE)	2.71	3.61	0.90	.000*
8	Affinity for Nature (AN)	3.04	3.69	0.65	.000*
9	Problem-solving Confidence (PSC)	2.63	3.53	0.90	.000*
10	Camp Connectedness (CC)	2.63	3.56	0.93	.000*
11	Spiritual Well-being (SWB)	2.17	2.43	0.26	.056
12	Outdoor Living Skill (OLS)	2.24	3.57	1.33	.000*
13	Outdoor Safety Awareness (OSA)	2.51	3.77	1.26	.000*
	Total	2.65	3.55	0.90	.000*

\* 05

### Discussion

In the conceptual framework of the subject “Outdoor Education and Camp” in Figure 1, the outdoor education camp provided various activities, programs and policy to students, such as arts and crafts, aquatics, games and sports, team building, group dynamic, leadership, adventure, special events, safety and first aid, camp fire, food preparation and distribution,

democratic system and civic responsibility, as well as expected students to have 13 outcomes, including family citizenship behavior in camp, friendship to camp members, responsibility to camp work, team work, Independence, perceived self-competence, affinity for exploration, affinity for nature, problem-solving confidence, Camp Connectedness, outdoor living skill and outdoor safety awareness. According to students participated in the outdoor education camp (OEC) had at least a Day Camp experiences before attending to OEC, they got use to encounter the negative influences as depressive symptom. The finding of this study also revealed that there was no significant difference in statistic in the outcome of spiritual well-being. Since the mean score before attended (2.17) and after attended (2.43) the OEC had slightly difference (see Table 2). At the same time the study of Cheng & Monroe (2011) showed that children's connection to nature, and previous experience in nature, influenced their intention to participate in nature-based activities in the future.

Moreover, student increased significantly 12 outcomes from pre-to post- outdoor education camp. Among these 12 outcomes, three priorities highest mean different scores between pre-and post-attended the outdoor education camp were outdoor living skill, outdoor safety awareness, and team work. Result of this study was similar to evidence showed that many youth programs support the development of teamwork (Larson et al, 2005), camp improved skills tied to teamwork (Garst & Bruce, 2003), and outdoor activities developed participants to increase awareness of things in nature and environment issues (Drener & Gill, 1994).

## CONCLUSION AND SUGGESTION

Outdoor education camp participation affected students' outcome not only enhance many forms of growth including affective, cognitive, behavioral, physical, social, and spiritual; but also promote life skills including being, relating, caring, thinking, giving, and working.

I recommend that teaching the subject "Outdoor Education and Camp" need to address the inherent value of outdoor experiences and encounters with nature within the scope of environmental and sustainability education. Furthermore, teachers should provide opportunities to experience student interconnection with natural environment as a dynamic rather than static concept (learning in the classroom).

## REFERENCES

- American Camping Association. (1990). *Outdoor living skills: Instructors manual*. IN: American Camping Association, Inc.
- American Camping Association. (2005). *Directions: Youth development outcomes of the camp experience*. Retrieved from: [www.acacamps.org/research/enhance/directions](http://www.acacamps.org/research/enhance/directions).
- \_\_\_\_\_. (2006). *Inspirations: Development supports and opportunities of youths' experience of camp*. Retrieved from: <http://www.acacamps.org/research/enhance/inspirations>.
- \_\_\_\_\_. (2010). *ACA core competencies*. IN: American Camping Association, Inc.
- Ballantyne, R., & Pacher, J. (2009). Introducing a fifth pedagogy: Experience-based strategies for facilitating learning in nature environment. *Environmental Education Research*, 15(2), 243-262. Doi: 10.1080/13504620802711282
- Bunting, C. J. (2011). *Interdisciplinary teaching through outdoor education*. IL: Human Kinetics.

- Cheng, J.C.; & Monroe, M.C. (2011). Connection to nature: Children's affective attitude toward nature. *Environment and Behavior*, 44(1), 31-49. Doi: 10.1177/0013916510385082
- Cooper, G. (1999). Changing roles for outdoor education centers. In P. Higgin & B. Humbustone (Eds.), *Outdoor Education and Experiential Learning in the UK* (pp. 43-49). Luneberg: University of Luneberg Press.
- Coutellier, C. (2002). *Today's camps*. Retrieved from April 4, 2002, from [http://: www.acacamps.org/research/todayscamps.9.html](http://www.acacamps.org/research/todayscamps.9.html).
- Dresner, M., & Gill, M. (1994). "Environmental education at summer nature camp". *Journal of Environmental Education*, 25(3), 35-41.
- ERIC. (2000). *Outdoor education*, p. 4. Clearing-house on rural education and small schools. Retrived July 9, 2001, from the <http://www.ael/eric/scopen.hyml>.
- Garst, B.A. & Bruce, F.A. (2003). Indentifying 4-H camping outcomes using a standardized evaluation process across multiple 4-H educational centers. *Journal of Extension*, 41(3)
- Garst, B., Browne, L., & Bialeschki, M.D. (2011). Youth development and camp experiences. *New Directions for Youth Development*, Summer 2011.
- Hammerman, W.M. (1980). *Fifty years of resident outdoor education, 1930-1980: Its impact on American education*. IN: American Camping Association.
- Hattie, J.A., Marsh, H.W., Neil, J.T. & Richards, G.E. (1997). Adventure education and outward bound: Out of-class experiences that make a lasting difference. *Review of Educational Research*, 67, 43-57.
- Henderson, K.A., Bialeschki, M.D., & James, P.A. (2007). Overview of camp research. *Child and Adolescent Psychiatric Clinics of North America*, 16(4), 755-767. Doi: 10.1016/j.jcho.2007.05.010
- Hendricks, P.A. (1998). *Targeting life skills model*. IA : Iowa State University Extensions.
- Ibrahim, H., & Cordes, K.A. (2002). *Outdoor Recreation: Enrichment for a Life time*. IL: Sagamore Publishing.
- Larson, R., Hansem, D., & Walker, K. (2005). Everybody's gotta give; Adolescents' development of initiative within a youth program. In Mahoney, J., Larson, R., & Eccles, J. (Eds.). *Organizing Activities at contexts of development* (pp. 159-184). NJ: Erlbaum.
- Moffitt, J. (2011). *Day camp programming and administration: Core skills and practices*. IL: Human Kinetics.
- Natural Environmental Education and Training Foundation (NEETF,). (2001). *Using environment-based education to advance learning skills and character development*. Washington, D.C.

- Retrieved March 4, 2002, from <http://www.neetf.org/pubs/enviroedreport.pdf>.
- Neil, J. (2007). *Factors which influence the effects of outdoor education programs*. Retrieved January 14, 2014, from <http://www.wilderdom.com/research/researchfactors.html>.
- Outdoor Industry Foundation. (2005). *Outdoor Recreation participation study for year 2004: Trend analysis in the United States*. CO: Leisure Trend Group.
- Outdoor Foundation. (2010). *Outdoor Recreation Participation Report*. CO: Outdoor Industry Association.
- Priest, S. (1986). Redefining outdoor education: A matter of many relationships. *Journal of Environmental Education*, 17(3), 13-15.
- Roberts, T.G. (2003). *An interpretation of Dewey's experiential learning theory*. Open Paper (ERIC Document Reproduction Service No. ED 481922).
- Smith, J., Carlson, R., Donalson, G., & Masters, H. (1972). *Outdoor Education*. NJ: Prentice-Hall.
- Wals, A.E.J., Geerlin-Eijff, F., Hubeek, F., Vander Kroom, S. & Vader, J. (2008). All mixed up? Instrumental and emancipator learning toward a more sustainable world: Considerations for policymakers. *Applied Environmental Education and Communication*, 7, 55-65.
- Wattchow, B. (2004). *Lived-experience in outdoor education: Expectations for the Educational practitioners/ Researchers*. Paper presented at the Connections and Disconnections: International Outdoor Education Research Conference, VIC, Australia. Retrieved March 16, 2012, from [http://www.latrobe.edu.au/education/assets/download/2004-conference\\_wattchow.pdf](http://www.latrobe.edu.au/education/assets/download/2004-conference_wattchow.pdf).
- Wells, N.M. & Lekies, K.S. (2006). "Nature and the life course: Pathways from children nature experiences to adult environmentalism". *Children, Youth and Environments*, 16(1), 1-24. Retrieved March 10, 2008 from <http://waaa.colorado.edu/journal/cye/>.

# **THE PERFORMANCE OF HEALTH AND PHYSICAL EDUCATION TEACHERS IN GOVERNMENT ELEMENTARY SCHOOLS GRADUATED FROM OPENED UNIVERSITY OF INDONESIA IN PURWOREJO**

**Triyono**

**Open University of Indonesia, Indonesia  
triyono@ut.ac.id**

## **Abstract**

This research aims at exploring the performance of health and physical education teachers in government elementary schools who graduated from Opened University of Indonesia(UT) especially in the area of Technical Implementer Unit (UPT) of Education and Culture Purworejo viewed from four aspects : pedagogic competence, personal competence, social competence and professional competence. This article only discusses the pedagogic competence of the health and physical education teachers. The design of this research is survey by collecting data from the questionnaire given to the students of grade V of government elementary schools, the health and physical education teachers, the principals and the supervisors( for observation). The population is all health and physical teachers in government elementary schools in UPT Purworejo. The subject of research consists of 29 health and physical education teachers ,580 students of grade V, 29 principals and 2 supervisors as the respondents. Data analysis uses evaluative analysis technique which is done by descriptive quantitative. The result of the research shows that the performance of health and physical teachers in government elementary schools graduated from UT in UPT Purworejo from the aspect of pedagogic competence is (1) students as respondents: 4% students claim that the health and physical teachers are less competent, 57 % quite competent, 35% competent, and 4% very competent.(2) teachers as respondents: 24% quite competent, 62% competent, and 14% very competent.(3) principals as respondents: 45% quite competent, and 55% competent.(4) the result of observation by supervisors : 27 health and physical education teachers are categorized to the very competent( 93.10%) and 2 teachers (6.89%) are categorized as competent. The conclusion is that the performance of health and physical education teachers in government elementary schools graduated from UT in UPT Purworejo is categorized as competent. The recommendation based on this research is that the health and physical education teachers in government elementary schools who graduated from UT in Purworejo region have to improve their performance continuously, especially their pedagogic competence as the students' judgment shows that this aspect is not optimal yet.

**Keywords:** performance, health and physical education teachers graduated from opened university.

## **INTRODUCTION**

Serious consideration towards human resources in an organisation gets increase because the productivity of an organisation is much determined by the performance of its human resources (Yasnimar Ilyas dan Aminudin Zuhaeri 2004:2). The indicator of a qualified nation is much determined by the level of its human resources, while the indicator of qualified human resources is determined by its society's educational level. The higher its human resources the better its educational level, or in the vice versa. On the other hand, the quality of education is influenced by the teachers' performance.

Teachers' performance needs to improve continuously because teachers are as the pioneers in developing the quality of human resources. Teachers are the ones who will produce qualified students; in case of their academic competence, skills, emotional maturity, moral and

spiritual so that they will be future generations who will be ready to live and face the challenge in their era. That's why we need teachers who have particular qualifications, competences and high dedication in doing their professional duties.

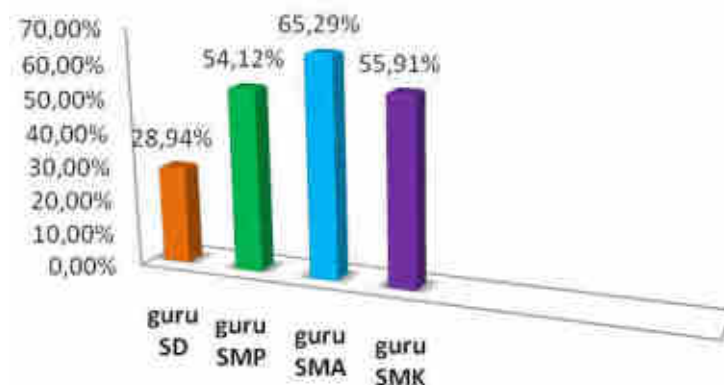
Related to the qualification of teachers, in fact the quality of Indonesian teacher is still unsatisfying.

**Table 1. Data of National Teachers' Qualification**

<b>NUMBER OF TEACHER</b>	<b>2.607.311 persons</b>
<b>QUALIFICATION</b>	
<i>Not Graduate from S-1</i>	<b>1.496.721 persons (57%)</b>
<i>S-1, S-2, S-3, and D-IV</i>	<b>1.110.590 persons (43%)</b>

Resource : Direktorat Jenderal Peningkatan Mutu Pendidik dan Tenaga Kependidikan Kementerian Pendidikan Nasional 2010

According to Surya Dharma, 2009 ( Balitbang Depdiknas), teachers' professionalism in Indonesia viewed from the aspect of appropriateness is still low.



According to Fanan (2005:12), the development of supreme culture can be done through education. The quality of education can only be gained through the management of education which is qualified. That's why, to guarantee that the objectives of qualified education can be achieved, teachers should be qualified in their fields. A qualified teacher is a teacher who has professional competences as an educator. *Studi Basic Education Quality ( 1992)* in Suryadi (2001:9) stated that “ A qualified teacher is determined by four main factors; they are (1) professional competence, (2) professional effort, (3) times spent for professional activities, and (4) accountability.”

However, the fact shows that the quality of education, especially physical education is still very poor. This poor condition which happened in elementary schools caused by several factors i.e. the lack of competence of health and physical education teachers. (Mutohir 2002:16). There are a lot of educators especially physical education teachers in elementary schools who don't have qualification required as stated in the law, that is S1 ( graduate) in the relevant discipline. Most of them graduated from Diploma 2 (D2).

**Table 2. Data of Health and Physical Education Teachers in UPT Purworejo  
Based on Their Almamaters**

SMTA			State University			Private University			JML	Certification I	
			U T	UN Y	UN S	IKIP PGRI Wate s	IKIP Muh.Pw r	IKIP BU,Ml g		No	Yes
SMO A	SG O	KG O	D2	S1	D2	S1	S1	S1			
2	0	3	29	1	2	3	1	7	48	34	14

Resource : The Office of UPT Pendidikan dan Kebudayaan Purworejo 2011

The government policy on the qualification of teachers always changes from time to time, suitable to the demand. Formerly, the elementary school teachers might only graduate from Teacher Training School ( SPG/SGO), then the regulation changed that they had to graduate from D2 and now they must graduate from minimally S1.

Teachers' performance has particular criteria. Teachers' performance can be seen and measured based on the criteria of competence that must be owned by each teacher. Based on the Regulation of Ministry of National Education of the Republic of Indonesia ( Permendiknas RI) No.16 year 2007 about Academic Qualification Standard and Teacher's Competence, educator's performance is attitude or response which gives result refers to what he does when he face a duty. Educator's performance includes all activities and attitudes which an educator experienced with. (Martinis Yamin and Maisah, 2010:87).

While the word 'competence' derived from English word which has similar meaning with 'being competent' and 'competent' is *having ability, power, authority, skill, knowledge, attitude, etc.* According to Fullan( in Hamzah Uno: 2008:62):

*Competence is broad capacities as fully human attribute. Competence is supposed to include all "qualities of personal effectiveness that are required in the workplace"; it is certain that we have here a very diverse set of qualities indeed: attitudes, motives, interests, personal attunements of all kinds, perceptiveness, receptivity, openness, creativity, social skills generally, interpersonal maturity, kinds of personal identification, etc. – as well as knowledge, understandings, action and skills .*

Basically, the term of competence above tends to what people or a society can do from what they know (*What people can do rather than what they know*). This opinion is emphasized by Houston, quoted by Samana, that teacher's competence is the ability performed by a teacher in doing his responsibility to give education services to the society.

Based on Regulation of Ministry of National Education No. 16/ 2007 and UU No.14/2005 about Teacher and Lecturer in subsection 10 stated that teacher's competence includes: 1) Pedagogic Competence, 2) Social Competence, 3) Personal Competence and 4) Professional Competence.

Academic competence and professional competence of a teacher are two integrated aspects, so that their formulation cannot be separated, as stated on clause 1 and 2, subsection 7 Law no. 14/2005 and also subsection 29 Government Regulation no. 19/2005. Related to the four competences above, if they are applied for elementary schools teachers, so the competences includes: 1) the competence to understand deeply the elementary schools students who are going to be served; 2) Mastering the field of study as the resource of learning for the students of elementary school, whether it is the disciplinary content knowledge or it is about the

pedagogical content knowledge; 3) The ability of conducting educational learning process; and 4) improving professional competence continuously.

Then, professional competence of elementary school teachers will be formed through the practicing of academic competence application in an authentic context that is in an elementary school by giving program of field experience systematically and intensively. So, for the reason of integrity of professional certificate that is given to the elementary school teachers, the basic reference which is used in managing various forms of professional education and the assessment of the mastery of pedagogical professional competence are the complete bodies of teachers' professional competences.

In Regulation of Ministry of National Education no 16/ 2007, it is stated the professional competence standard that must be owned by a teacher, e.g.

- 1) Mastering material, structure, concept and scientific mind set which support the subject being taught.
- 2) Mastering standard competence and basic competence of the subject.
- 3) Developing the subject of teaching creatively.
- 4) Developing professionalism continuously by doing reflective action.
- 5) Using information and communication technology for communication and self development.

Based on the background above, this article will describe the result of research related to self assessment of health and physical education teachers, students, principles, and supervisors towards the performance of health and physical education teachers in government elementary schools in UPT Purworejo viewed from the aspect of professional competence. The professional competence aimed to explore the competence aspects of:

- 1) Applying the educational foundations such as: philosophical foundation, psychological foundation, sociological foundation and so on.
- 2) Applying the theory of learning appropriate to the level of students' development.
- 3) Handling and developing the subject learning which become his responsibilities.
- 4) Applying various methods of teaching and learning.
- 5) Developing and using various teaching aids, media and learning resources which are relevant.
- 6) Organizing and doing teaching and learning programs.
- 7) Doing evaluation towards students' achievements.
- 8) Growing students' personalities ( Mulyasa, 2008: 135 – 136 ).

The benefits of this research are divided for (1) *health and physical education teachers*: for self assessment, that is to know the weaknesses and the lack of personal quality. By knowing these, we can reconstruct the way of thinking and behavior to refine and improve professionalism as future health and physical education teachers. (2) *Institution/ users*: as resource of reflection to increase the professional educational services for the society. (3) *Government*: to give feed back in deciding policy, especially relates to the program of certification of health and physical education teachers and for other teachers in general.

## RESEARCH METHOD

This research is designed by using Survey technique. The population of this research is all health and physical education teachers in the government elementary schools in the Ministry of Education and Culture in Purworejo (29 persons), and the respondents are students (580 persons). The samples are 20 students of grade V of each school where the health and physical education teachers teach in. Data collection is by distributing questionnaires to the health and physical education teachers for self assessment, to the students of grade V (580 questionnaires) and principals (29 questionnaires) and supervisors (2 sheets of observation). Data analysis uses percentage which then is described narratively.

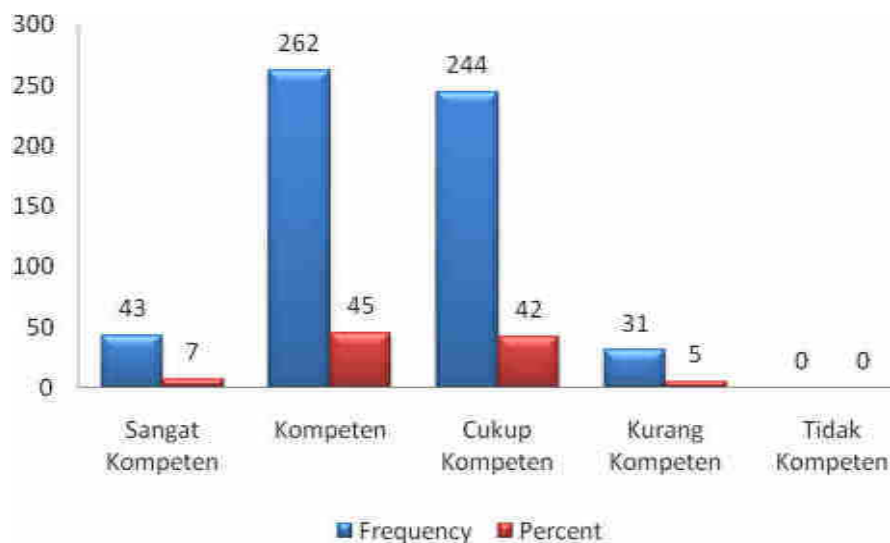


## THE RESULT OF THE RESEARCH AND THE DISCUSSION

### The Result of The Research

The survey found this following data:

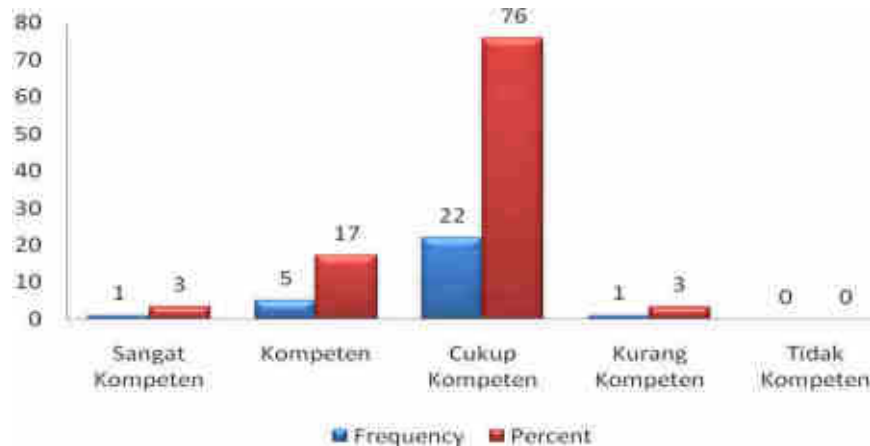
#### 1. Students' Assessment



**Figure 1. Professional Competence of Health and Physical Education Teachers in Elementary School – Students as the respondents**

Picture 1 shows that the performance of health and physical education teachers of elementary schools who graduated from Opened University in case of their professional competence, from 580 students who answered the questionnaire, 31 students ( 5% ) declared that the teachers are *less competent*, 244 students (42% ) declared that the teachers are *quite competent*, 262 students ( 45% ) declared that the teachers are *competent* and 43 students ( 8% ) declared that their teachers are *very competent*.

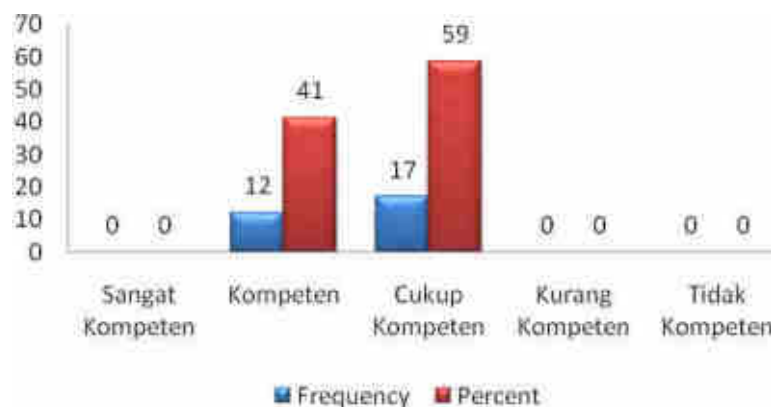
#### 2. Teachers' Assessment



**Figure 2. Professional Competence of Health and Physical Education Teachers in Elementary School – Teachers as the respondents**

Picture 2 shows that the performance of health and physical education teachers of elementary schools who graduated from Opened University in case of their professional competence, from 29 teachers who answered the questionnaire, 1 teacher ( 3% ) declared that the teachers are categorized as *less competent*, 22 teachers ( 76% ) declared that the teachers are categorized as *quite competent*, 5 teachers ( 17% ) declared that the teachers are categorized as *competent*, and 1 teacher ( 3% ) declared that the teachers are categorized as *very competent*.

### 3. Principals' Assessment



**Figure 3. Professional Competence of Health and Physical Education Teachers in Elementary School – Principals as the respondents**

Picture 3 shows that the performance of health and physical education teachers of elementary schools who graduated from Opened University in case of their professional competence, from 29 principals who answered the questionnaire, 17 principals ( 59% ) declared that the teachers are *quite competent* and 12 principals ( 41% ) declared that the teachers are *competent*.

#### 4. The Result of Observation by Supervisors



**Picture 4. Data of The Result of Assessment towards the Performance of Health and Physical Education Teachers (IPKG )In Implementing Teaching and Learning Process by Supervisors.**

Notes:

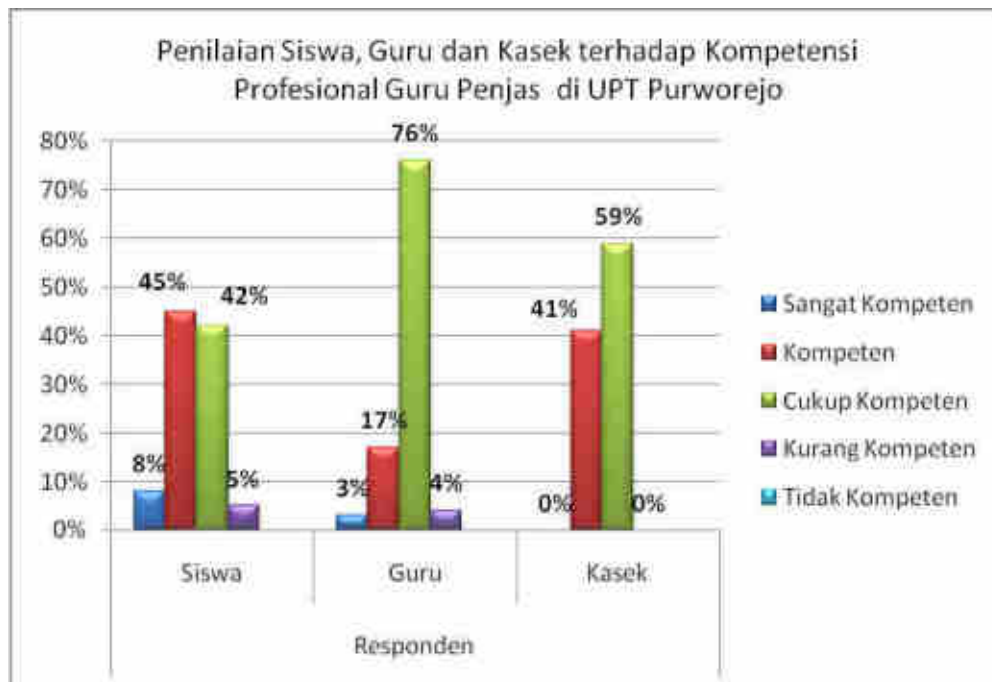
1. Classroom and learning facilities management.
2. Implementing teaching and learning activities.
3. Managing class interaction.
4. Opened minded and flexible in helping students to develop students' positive attitude in learning.
5. Demonstrate specific skills in teaching health and physical education.
6. Giving evaluation on ongoing process and learning outcomes.
7. General impression towards the teachers' performance.



**Picture 5. Category of Teaching Implementation Competence**

By the result of 2 supervisors shows that from 29 teachers of health and physical education in elementary schools in UPT Education and Culture Purworejo, 27 ( 93.10%) of the health and

physical education teachers in government elementary schools categorized as very competent and 2 (6.89%) teachers are categorized as competent.



**Picture 6. Percentage of Three (3) Respondents; Students, Teachers and Principals Towards Professional Competence**

## Discussion

Assessment using *multi assessment* has an advantage that is to give different point of view in evaluating performance. It is predicted that a teacher who makes a self assessment ( tend to give good result) will have different result from that is assessed by others, his students, his principal or by supervisors. The result of this research as showed in picture 4 ( four) on the health and physical education teachers in government elementary schools graduated from Opened University in Technical Implementer Unit of Education and Culture Purworejo is as the followings:

## Professional Competence

Professional competence is a basic competence of a teacher in mastering the knowledge about learning and human's behavior, about the subject taught, appropriate attitude in teaching and learning process, and skillful in teaching and learning technique. Professional competence is closely related to the profession which demands various specific skills in education field or teaching. Suitable with Law No.14 year 2005, Chapter II Subsection 2 Clause (1) states that teacher has a position as a professional worker in the basic education level, advanced education level, young learners education in formal pathway which is selected based on the law regulations. Professional means doing something as a main job, as a profession and not as a part timer job. A professional teacher has to have a broad knowledge of the subject matter ( discipline) which is being taught and master the methodology, have a theoretical concept and able to choose method in teaching and learning process. The result of the research on the performance of health and physical education teacher graduated from

Opened University of Indonesia especially on the aspect of professional competence is quite good; 42% students declared quite competent and the rest 45 % declared competent. None of the students as respondents declared that the teachers are not competent in the aspect of professional competence. However, there is still a problem faced by health and physical education teachers in the aspect of professional competence, that is the lack of ability in using technology such as computer and internet as the resource of study, the use of LCD projector in classroom teaching and learning and as a matter of fact, most of the health and physical education teachers in elementary school in UPT Education and Culture in Purworejo seldom or even never participate in scientific activities of professional organization. From the data, it is found that most of health and physical education teacher rarely use research results to increase the quality of teaching and learning.

The result of the questionnaire and interview with the students, researcher finds information that health and physical education teachers rarely give information about the material of the coming meeting. On the other hand, there is a teacher ( 4% ) declared that he himself is not competent. It means that he is a sportive and honest teacher for he realizes that he is less professional in teaching. 22 ( 76% ) declared quite competent ( the highest percentage of all), and only 5 teachers ( 17% ) declared as competent and only a teacher who was brave to claim that he is very competent. Of course this statement is very subjective because someone is not absolutely true in assessing himself. As the leaders, the principals give assessment towards the health and physical education teachers and categorize them into *quite competent* ( 59%) and 41 % is *competent* in the aspect of professional competence. It means that as a profession, the health and physical education teachers who graduated from Opened University are considered to be quite good in their professionalism viewed by the users of their services. The health and physical education teachers, however, needs to learn more and more to improve their professionalism as stated on the law because there are still 31 students ( 5%) declare that they are less professional.

The result of this research is supported by the result of the observation done by the supervisors. It is found that the teachers of health and physical education graduated from Opened University in UPT Education and Culture in Purworejo are categorized as very competent 27 teachers ( 93.10%) and 2 teachers (6.89%) is categorized into competent. It means that the teachers of health and physical education graduated from Opened University has good professional competence.

## THE LIMITATION OF THE RESEARCH

A research commonly has a limitation or weaknesses. So as this research. The weaknesses are for instance:

- 1) This research is not completed with formal interview instrument, so the researcher cannot get deeper information and data from the respondents about their opinions, reasons and comments related to the topic of this research. But the researcher interviewed some respondents although the questions were not arranged systematically, so the arrangement of the questions were uncontrolled.
- 2) The subjectivity of the supervisors as the observers tends to give good assessment towards the teachers in the area of Technical Implementer Unit Purworejo. Under the assumption that the result of the research which indicates low level of performance will influence psychologically towards the supervisors in building their lower personnels. Otherwise, if the result of the research is good, they will get good respect from their leaders. Actually the researcher has tried to persuade them to be objective in giving assessment to get an accountable result.

- 3) Times provided for this research is very limited or short, while there are many aspects of education related to this research.

## **CONCLUSION**

Based on the data analysis and the discussion above, it is concluded that the performance of health and physical education teachers in the government elementary schools graduated from UT in Purworejo viewed from the aspect of professional competence; 59% of three kinds of respondents declare that they are quite competent and 3% of students and teachers declare that they are less competent those who don't use technology in teaching and learning process.

## **IMPLICATION**

It is hopefully that the result of this research can motivate teachers of health and physical education in the government elementary schools graduated from Opened University and others to improve their performance quality through four aspects of competence: pedagogic, personality, social and professional competence. The result of this research finds that the teachers of health and physical education in government elementary school in Purworejo are generally competent, it doesn't mean that automatically they said to be professional and have done their responsibilities professionally. Moreover, the teachers should always improve their professionalism by learning continuously and change their performance better, so that they can always adapt themselves to the life demand.

This research can also answer the people's doubt about the quality of Opened University as the producer of basic education teachers.

Finally, It depends on the individual's behavior how to improve his professionalism by changing his mind set to adapt to the development of knowledge and technology. By getting good "reward" as a professional teacher, the teacher should be ashamed if they cannot prove their professionalism.

## **SUGGESTION**

### **For Health and Physical Education Teachers**

- Teachers should learn from their weaknesses which showed by their students, principals, supervisors and their own assessment from the aspect of professional competence.
- Teachers should use technology ; such as computer, internet, LCD and others as teaching and information resources.
- Never forget to inform the following material for the next session.
- Teachers should participate in scientific forums.
- Use the result of research to update their discipline.

### **For Institution /Users**

- The institution /users ( principals, supervisors) should always motivate, support, and provide facilities for health and physical education teachers to improve their qualification and performance.

### **For the Regional Government**

- Give larger opportunities to the health and physical education teachers to continue their studies to the higher level of education by giving flexible regulation for them.

### **For Opened University of Indonesia**

- This institution should increase its quality and academic services and use alumni as media of evaluation for each study program.

### **REFERENCES**

- [1] Departemen Pendidikan Nasional, *Pendidik dan Tenaga Kependidikan Menghadapi Era Global*, Direktorat Jenderal Peningkatan Mutu Pendidik dan Tenaga Kependidikan SIMPTK 2008, 2008
- [2] Dharma, Surya, *Pendidik dan Tenaga Kependidikan Menghadapi Era Global*, Jakarta: Direktorat Jenderal Peningkatan Mutu Pendidik dan Tenaga Kependidikan Departemen Pendidikan Nasional, 2009.
- [3] Fanan, F.A., *Indonesia memerlukan Budaya Organisasi*.  
<http://bataviase.co.id/detailberita-10376825.html> [accessed 2/2/2011], 2005.
- [4] Ilyas.Y dan Zuhaeri.A, *Pengembangan Sistem Penilaian Kinerja Sumber Daya Manusia Pada Institut Pendidikan Tinggi Jarak Jauh. Indonesian Journal Of Open And Distance Learning*, Vol.5, No.1 Maret 2004 Pusat Studi Indonesia, Lembaga Penelitian - Universitas Terbuka, 2004.
- [5] Morrow, Jr. J.M. et al. *Measurement and Evaluation in Human Performance*. (2<sup>nd</sup> Ed), Human Kinetics. New York: Macmillan Publishing Co., Inc, 2000.
- [6] Mulyasa, E., *Standar Kompetensi dan Sertifikasi Guru*, Bandung: Remaja Rosdakarya, 2008.
- [7] Undang-undang Republik Indonesia Nomor 14 Tahun 2005, *Tentang Guru dan Dosen*. Yogyakarta: Pustaka Pelajar, 2005.
- [8] Wardani, I.G.A.K, Siti Juliaha dan Ngadi Marsinah, *Pemantapan Kemampuan Profesional (Panduan)*. Jakarta: Universitas Terbuka, 2004.
- [9] Yamin, Martinis dan Maisah, *Standarisasi Kinerja*, Jakarta: Gaung Persada, 2010.

# ANALYSIS FACTORS RELATED TO OVERWEIGHT AT STUDENT OF JUNIOR HIGH SCHOOL

Wilda Welis

Padang State University, Indonesia  
wildawelis@yahoo.co.id.

## Abstract

Overweight is an increase of body weight above a standard for age and sex. Overweight is problem of nutrition imbalance as more foodstuff are store as fat than are use for energy and metabolism. This study aim to examine factors that related to overweight at student of high school. This research using crosssectional design and simple random sampling. The samples were student grade 1-3 of high school at Bogor, total sample are 194 students. Data analysis by chi square and multiple logistic regression. Variables age, sex, knowledge nutrition, body perception, pocket money, food frequency, habit of snacking, fastfood consumption, energy consumption, habit of physical activity , family income, father and mother' education and nutritional status of parent are as independent variables. The result of this study found that subject with overweight was 44,9%. Based on bivariate analysis, male, habit of snacking, low level physical activity, low father's education, low family income and parental overweight showed significant correlation with overweight in adolescent. The most dominant variable to overweight was habit of snacking.

**Keywords:** overweight, energy balance, physical activity

## INTRODUCTION

Obesity is one of the health problems that prevalently increase in the world population. Giving the increasing prevalence worldwide over the last decade to childhood and adolescent obesity, the risk of morbidity and mortality which the obesity is associated with prevention has become an international public health priority requiring the implementation of effective interventions. The obesity mainly increases in the middle-income groups and in the upper ones, due to the excess of energy consumptions. In the upper and middle-income classes, this obesity is also exacerbated by their trends to consume much fast food of high energy and protein. Absolutely, consuming fast food in urban areas is much higher than in rural areas (Jalal & Atmodjo, 1998). Consuming the excessive energy and lack of physical exercises accumulate fat in the body. Thus, they cause the obesity.

In implicating many dietary factors, the percentage of energy from dietary fat has received particular attention. Recently, however, an expert panel concluded that dietary fat may not be the sole dietary determinant of body fatness, but it has widely been assumed to be (McCrory *et al.*, 1999). In addition, a low level physical activity is another factor to obesity and overweight. This, of course, leaves little time for other physical exercises, like sports. According to Susenas (1995), the digit of the urban's habits in getting exercises in aged 10 years and above is 39.55 percent; and 5.5 percent for those in everyday exercises (Department of Health, 1997). Riskesdas (2007) also showed that 48,2 of people in aged 10 years and over do less physical activities.

In developed countries like the United States, the prevalence of overweight in the age range 6-17 years was 22% (Troiano *et al*, 1995). Meanwhile, according to Wang (2002), the prevalence of overweight in the United States is 27.3%. In Australia, according to Harvey *et al* (1994) of 20% more malnourished school children. In China, the prevalence of overweight in the age group 10-18 years was 6.2% in 1997. While Brazil and Russia, respectively 12.3% and 8.5% (Wang *et al*, 2002). In Riyadh in 1999, the prevalence of overweight was 10.5% and obesity was 8.7% in the age group 6-17 years (Shammari *et al*, 2001). In Thailand at 9.3% of children aged 11-17 years were overweight (Samsudin, 1993). According to Florentino *et al* (2002), the prevalence of overweight children in the Philippine private schools is 24.9%.



Meanwhile, in Malaysia there are 19.2% boys and 16% girls more malnourished (Tee et al, 2002)

In Indonesia, the prevalence of overweight and obesity in adolescents are not nationally well known. However, the research shows this tendency increased. According to Samsudin, from anthropometric measurements which were performed by the Department of Health and Namroe in 1987, the age of 6 to 18 years in Jakarta showed the incidence of overweight and obesity, respectively 10.0 % and 3.1 % for boys and of 23.0 % and 10.2 % for girls . A research on nutrition in Bandung, West Java, showed that 9 % of the school children of men and 15 % of girls from different socioeconomic levels and aged over 10 years have a weight above the 97th percentile. While in 1991, it showed 23% of male students and 28 % of female students whose good socioeconomy have 97 weight percentile ( Rasmikayati et al, 1997) . The findings of Soekirman's , et.al (1999), the prevalence of overweight was 23.7 % in children aged 8-10 years in the area of Bogor and Jakarta West. Meanwhile, Rijanti (2002) found that 29.8 % incidence rate in overweight is primary school children in Depok .

Over nutrition and obesity will cause degenerative diseases such as coronary heart disease (CHD), hypertension, diabetes mellitus and other diseases. Psychosocially, a person in over nutrition and obesity faces difficulty in a physical activity, low self-esteem, a sense of distress and despair (Ranakusuma, 1990). The tendency shows that the higher overweight in adolescents, the more problems effect to them. The overweight and obesity, which occur to children and adolescents, will settle down to them when they are growing up to adult. Thus, these problems are relatively difficult to overcome (Dietz, 1994). However, Samsudin (1993 ) postulates that the impact of over nutrition on the children health is generally little if compared it's impact to the adults. The impact of obesity to children shows that the children's growth and physical development of mature faster. Thus, a woman gets her fist menstruation earlier, such as psychosocial impact of relation limits, respiratory disorders, hypertension, dermatitis or eczema on skin folds, which cause bad odors to the body.

The tendency of the increasing of overweight to adolescents, especially, for students of junior high school is very alarming because it will lead to degenerative diseases such as diabetes mellitus, coronary heart disease, high blood pressure later they mature. Junior high school students are the future generation who will be the development of resources in the future. Overweight at a relatively young age are likely to be settled until adulthood and is relatively difficult to overcome. Overweight adolescent problems has become as a clinical problem sporadically, mainly in big cities. This relates to researchers interested in studying the factors associated with the incidence of overweight in adolescents.

#### **THE OBJECTIVE OF THE STUDY**

The objective of this research is to describe the factors that related to overweight of adolescents or the students of junior high school.

#### **RESEARCH METHOD**

Cross-sectional design of this study is that between the independent variables and the dependent variable observed at the same time. This research was conducted in SMP Kesatuan and SMP Bina Insani at Kota Bogor. The number of selected samples are 194 people taken at random from a population of 681 students.

Instrument used was a questionnaires and scales Seca with accuracy of 0.1 kg and height measuring with a microtoise. Data collected included age, sex, nutritional knowledge, perception of the body, the amount of uang saku, frequency of meals, snack habits, fast food consumption habits, physical activity and exercise habits obtained through questionnaires. Data weight and height obtained by the weighing scales and height measurements with microtoise. Student meal consumption data collected through recall. Data parental education, parental income and nutritional obtained with a questionnaire sent by students.

## Data Analysis

The data is processed using univariate study to look at the distribution of the data. To determine whether there is a relationship between the dependent variable with the independent variables then performed bivariate analysis with chi squared test. To investigate factors associated overweight used multiple logistic regression. The first phase of the selection of variables potentially in the multivariate analysis. The variables entered the multivariate analysis have when  $p$  value  $< 0.25$  and if substance closely related to the incidence of overweight (Mickey & Greenland, 1989) in Hosmer & Lemeshow (1989).

## FINDINGS AND DISCUSSION

### Overweight, Ages dan Sex

Based on the results of this study obtained a description of the nutritional status of respondents using body mass index (BMI) for age and sex (WHO, 1995). When the nutritional status grouped into two categories shows that the proportion of respondents with a normal category / less amount more (55.1%) than the proportion of respondents with more nutrition (44.9%) (Table 1.). Most (54.6%) of the respondents of this study age  $< 13$  years. According to Table 1 that amount of female respondents more (51.0%) than male respondents.

**Table 1. Distribution of Respondent According to Nutritional Status, Age and Gender**

Nutritional Status	Number (n)	Persentase (%)
Overweight	87	44,9
Non overweight	107	55,1
Total	194	100,0
<b>Age</b>		
$> 13,5$ years	88	45,4
$\leq 13,5$ years	106	54,6
Total	194	100,0
<b>Gender</b>		
Female	99	51,0
Male	95	49,0
Total	194	100,0

Statistical test results showed no significant relationship between the incidence of sex with overweight. Male respondents more likely to overweight larger than the female respondents. This finding is in line with the McMurray et al (2000) who obtain the prevalence of overweight in young males is higher (35%) than girls (34%). These findings are similar to research done by Nugroho (1999) which suggested a link between the sexes with more nutrition.

### Knowledge to nutrition, Perception to the body and the amount of uang saku

Nutritional knowledge was instrumental in selecting nutritious foods. With the knowledge of good nutrition hopefully someone is able to choose the right foods as needed. In this study, the percentage of respondents who have a high nutritional knowledge as many (59.8%) compared with those who had low nutritional knowledge.

The results of the analysis of research data found that respondents with low category perception of the body more (53.6%) when compared to respondents with moderate category perception of the body. From the results of this study also shows that the respondents with a high category of amount of uang saku fewer (45.4%) compared to respondents with a low category amount of uang saku (54.6%). Statistical analysis of test results show that there is no significant relationship between nutritional knowledge, perception of the body and the amount of uang saku toward overweight. Distribution of respondents according to nutritional knowledge, perception of the body and amount of uang saku can be seen in table 2.

**Table 2. Distribution of Respondents According to Nutritional Knowledge, Perception of the Body and Amount of Uang Saku**

Variabels	Number (n)	Percentage (%)
<b>Nutritional Knowledge</b>		
Low	58	40,2
High	136	59,8
Total	194	100,0
<b>Perception</b>		
Low	114	53,6
Moderate	80	46,4
Total	194	100,0
<b>Uang Saku</b>		
High	88	45,4
Low	106	54,6
Total	194	100,0

#### **Meal Frequency, Snack Habits dan *Fastfood* Habits**

The results of the analysis of the data shown, respondents with a food-frequency <3 times as many (87.1%) than respondents with a food-frequency > 3 times a day. The results of this study also found that the proportion of respondents who always snack 51.0 percent, while the occasional snack is 49.0 percent. A total of 82.5 percent of respondents used to consume fast food less than or equal to three times a week. Statistically, there was no relationship between the frequency and consumption of fastfood. Distribution of respondents according to the frequency of meals, snacks habits and the consumption of fast food habits can be seen in Table 3.

There was a significant association between the habit of snacks with overweight. Respondents were always snacks in school was 3.9 times will be overweight than respondents that occasionally snack at school. The results of this study together with the findings of the study Marbun (2002), Meilinasari (2002) and Darmawan (2001) who found there are a significant association between the habit of snacks with overweight. According Fardiaz and Fardiaz (1992) street food contributes significantly to specific consumer groups such as students, college students, workers and employees. In adolescents, snack contribution to the energy adequacy of 28.5 percent and the protein adequacy of 43.0 per cent.

**Table 3. Distribution of Respondent According to Meal Frequency, Snack Habit and *Fastfood* Consumption**

Meal Frequency	Number (n)	Percentage (%)
> 3x per day	25	12,9
≤ 3x per day	169	87,1
Total	194	100,0
<b>Snack Habit</b>		
Always	99	51,0
Sometimes	95	49,0
Total	194	100,0
<b><i>FastFood</i> Consumption</b>		
> 3x week	34	17,5
≤ 3x week	160	82,5
Total	194	100,0

### Energy Consumption and Macro Nutrition

Distribution of respondents according to the energy consumption of macro-nutrients can be seen in Table 4. The table shows that the majority (83.5%) respondents energy consumption below or equal with the recommended dietary allowance (RDA). There are 16.5 percent of respondents who consume energy just above (RDA). Respondents with fat consumption > RDA there as much as 52.1 percent, higher than respondents with fat consumption < RDA. There is no relationship between energy consumption and fat with overweight. This is probably because the average energy consumption of respondents still under RDA, so that the fat is not needed as a backup, but to meet the needs of both basal metabolism and for the physical activity. Another reason for the accumulation of fat causes overweight is not a fast process (at the present time only), but the process has been going on long enough.

**Table 4. Distribution of Respondent According to Energy and Fat Consumption**

Energy Consumption	Number (n)	Percentage (%)
> RDA	32	16,5
≤ RDA	162	83,5
Total	194	100,0
<b>Fat Consumption</b>		
> RDA	101	52,1
≤ RDA	93	47,9
Total	194	100,0

### Physical Activities and Exercises

The results of the analysis of research data found that respondents with long watching television more two hours a day more ( 69.1 % ) when compared respondents with long watching television less than two hours a day . Respondents who slept more than eight hours a day is 37.6 percent , lower than respondents who slept less than eight hours a day . This study found that the majority of respondents ( 75.8 % ) have a low exercise habits . Just as much as 24.2 percent of respondents with a high exercise habits . The type of exercise performed respondents are badminton , basketball, soccer, swimming, bikes, gymnastics, volley ball, karate, taekwondo, tennis, bowling, running, jogging, push ups and sit ups . Minimal respondents exercise is 30 minutes . There was a significant relationship between exercise habits with overweight. The results were consistent findings with Meilinasari (2002) , Rijanti (2002) , Bernard et.al (1995) and Salbe et.al (2002) and Klesges (2002 ) who found no association between exercise habit with overweight. While other findings such as Anonymous (2002), Mc Murray (2000), Gazzaniga and Burn (1993), Subardja et al (2000), Pearcey and Castro (2002), Einsenmann et.al (2002) mentioned that there was a relationship of physical activity ( including sports activities ) with a lower body mass index .

**Table 5. Distribution of Respondent According to Watching TV, Sleep and Exercise**

Watching TV	Number (n)	Percentage (%)
> 2 hours per day	134	69,1
≤ 2 hours per day	60	30,9
Total	194	100,0
<b>Sleep</b>		
> 8 hours per day	73	37,6
< 8 hours per day	121	62,4
Total	194	100,0
<b>Exercise</b>		
Low	147	75,8
High	47	24,2
Total	194	100,0

According Parizkova (undated) is not only the level of spontaneous activity was lower in overweight adolescents but also time to games were less active than normal adolescent. Participation overweight adolescent in sports clubs was low frequency. According to Bray (1993) physical activity (sports) may increase fatty acid oxidation by muscle, regular exercise can lower the tendency to become overweight. Physical exercise raises muscle tissue hypertrophy, in addition, the body fat will decrease gradually. Distribution of respondents according to physical activity and exercise habits can be seen in Table 5.

### **Income, Parents Educations and Their Nutritional Status**

Family income is obtained from the amount of income received by the father and mother (when working). In Table 6 it appears that nearly all (81.0%) respondents family income is low. There are 19.0 percent of the income of parents were high category.

**Table 6. Distribution of Respondent According to Income, Education and Nutritional Status of Parents**

<b>Income</b>	<b>Number (n)</b>	<b>Percentage (%)</b>
High	24	19,0
Low	102	81,0
Total	126	100,0
<b>Father's Education</b>		
Low	70	41,2
High	100	48,8
Total	170	100,0
<b>Motber's Education</b>		
Low	111	63,8
High	63	36,2
Total	174	100,0
<b>Parent's Nutritional Status</b>		
Overweight	93	55,7
Non Overweight	74	44,3
Total	167	100,0

Respondents with high education fathers categories more (58.8%) than low education fathers category. The reverse of the distribution of respondents according to father's education, respondents with low mother's education categories higher (36.2%) compared to respondents with low mother's education categories. In Table 6. seen that respondents with one or both parents overweight categories higher (55.7%) than respondents who non overweight parents (44.3%). The results of statistical tests that there were relationship between income and nutritional status of the parents with overweight.

The findings of Wang, Y. et al (2001) to mention China and Russia, overweight experienced by high economic groups. According to WHO (2000) with increasing revenues, traditional diets tend to change with the increased intake of animal protein and fat and sugar consumption and decreasing consumption of complex carbohydrates.

The possibility of a child becoming overweight 7% if no parent is overweight, to 40% if one of the parents is more nutrition and increased to 80% if both parents are obese (Nguyen et al, 1996). Nguyen et al further explained that children of overweight parents tend to experience a decline in the ability to increase fat oxidation when fat intake increased compared with children with no parental nutrition. Meanwhile, according to Eck et al (1992) in Obarzanek (1994) asserts children at high risk for overweight if their parents are also overweight.

### **The Factors of Overweight**

The results of multivariate test shows that the variables gender, snack habits , consumption of carbohydrate, long sleep and nutritional status of the parents is variable jointly significantly associated with better nutrition . Male respondents likely to experience overweight 4,348 times than female respondents . Respondents were always likely to snack every day 5,311 times overweight than the respondents sometimes snack . While respondents who sleep more than 8 hours a day chance to 2,709 times compared with who slept less than or equal to 8 hours a day . When viewed from the consumption of carbohydrates , respondents who consumed carbohydrate nutritional above RDA likely 2,250 times overweight than respondents who carbohydrate consumption was less or equal RDA . The respondents that either one or both parents have overweight 3.294 times likely than respondents with both parents of non overweight .

When viewed from the five variables turned out to snack habit variable was the variable most related. This is understandable because it is a snack habits of adolescent were almost evenly across all study sites conducted by Harahap et al (1998)

Street Food Project IPB survey found that the contribution of street food on the menu adolescents in a day in the Bogor is quite high. 21.5% of energy and 20% of the RDI of protein derived from snacks. The availability of various types of snacks in school will obviously contribute significantly to the incidence of overweight, if the student is not provided with adequate nutrition knowledge. This is because there are many negative aspects, positive aspects in addition to snack food consumption. Among the negative aspects in terms of nutrition is still a lot of street food that does not contain even a high-fat balanced nutrition and energy, while in terms of food safety sanitation or hygiene quality is still low and many are using food additives and harmful to health (Fardiaz & Fardiaz, 1992).

### **CONCLUSION AND SUGGESTIONS**

Based on the results of the study concluded that the incidence of overweight was significantly associated with gender, snack habits, exercise habits, education level and nutritional status of the parents. Among all of these factors, the habit of eating snacks are the most dominant factors on the incidence of overweight.

Government should improve the implementation of activities related to UKS to provide more information about the nutritional prevention. Encouraged also to the schools to supervise the cafeteria and traders streetfood around the school in order to provide education about healthy eating and food safety.

### **REFERENCES**

- Bray, G.A, 1993. The Nutrient Balance Approach to Obesity. *Nutrition Today*, vol. 28, no.3.
- Dietz, 1994. Critical Periods in Childhood for The Development of Obesity. *AJCN* 59: 955.
- Depkes, 1997. *Survey Kesehatan Rumah Tangga 1995*. Jakarta.
- Fardiaz & Fardiaz, 1992. *Makanan Jajanan dan Peluang Peningkatannya*. Gizi Indonesia Vol. XVII, No.1.
- Harahap dkk, 1998. Kebiasaan Makan dan Jajan Anak Sekolah Dasar Penerima PMT AS di Desa IDT. *Gizi Indonesia*, (23).
- Hosmer & Lemeshow, 1989. *Applied Logistic Regression*. John Wiley & Sons. New York.
- Lemeshow et al, 1997. *Besar Sampel dalam Penelitian Kesehatan*. Gajah Mada University Press.

- McMurray, R.G. et.al, 2000. The Influence of Physical Activity, Socioeconomic Status and Ethnicity on the Weight Status of Adolescent. *Obes. Res.*8:130-139.
- McCorry MA et al., 1999. Dietary variety within food groups: association with energy intake and body fatness in men and women. *Am J Clin Nutr* 1999;69:440–7.
- Marbun, 2002. *Hubungan Konsumsi Makanan, Kebiasaan Jajan dan Pola Aktifitas Fisik dengan Status Gizi Siswa*. Tesis PS IKM UI.
- Magarey et al, 2003. Predicting Obesity in Early Adulthood from Children and Parental Obesity. *Int. Journal of Obesity*, vol 27 (4) (www. Int. Journal of Obesity, akses tgl 11/7/03).
- Nguyen et.al, 1996. Fat Intake and Adiposity in Children of Lean and Obese Parent. *AJCN* 67:507
- Rasmikayati, R dkk., 1997. *Prevalensi Gizi Lebih dan Persepsi Orang tua Anak TK tentang Gizi Salah di Kodya Bandung*. Laporan Penelitian. Fakultas Pertanian. Unpad.
- Ranakusuma, 1990. Obesitas dan Manfaat Serat. *Gizi Indonesia*. 15(1); 76-80.
- Riskesdas. 2007. Laporan Hasil Riset Kesehatan Dasar. Badan Penelitian dan Pengembangan Kesehatan. Depkes RI. Jakarta.
- Shammari et al, 2001. Community based Study of Obesity among Children and Adults in Riyadh Saudi Arabia. *Food and Nutrition Bulletin*, vol. 22 no. 2.
- Salbe et.al, 2002. Assessing Risk Factors for Obesity Between Childhood and Adolescents : Energy Metabolism and Physical Activity. *Pediatrics*, vol 110 no.2.
- Samsudin, 1993. *Gizi Lebih pada Anak dan Masalahnya*. Widya Karya Nasional Pangan dan Gizi V. 20 –22 April 1993.
- Satoto, 1993. *KIE Gizi Lebih Sebagai Bagian dari KIE Gizi Ganda*. Widya Karya Nasional Pangan dan Gizi V. Jakarta 20 – 22 April 1993.
- Suhardjo, 1989. *Sosio Budaya Gizi*. Depdikbud-Dikti. PAU – IPB. Bogor.
- Tee et al, 2002. Regional Study of Nutritional Status of Urban Primary Schoolchildren. Kuala Lumpur, Malaysia. *Food and Nutrition Bulletin*, vol. 23 no. 1.
- WHO, 2000. *Obesity, Preventing and Managing the Global Epidemic*. Technical Report Series 894.

# **DESIGNING MOTOR LEARNING IN PHYSICAL EDUCATION AT SCHOOLS**

**Yudanto**

**Yogyakarta State University, Indonesia  
yudatrias@yahoo.com**

## **Abstract**

Physical Education has a goal to develop the cognitive, affective, psychomotor, and physical domain. Motor learning is an essential part of physical education in schools. Motor learning is defined as an attempt to change the motor behaviour through the conditions and situations that deliberately created to make the process of change to be effective and efficient. Developing motor skills is a part in motor learning. Physical and psychomotor domains have more important role in motor learning. Physical education teachers have a very important role in determining the success of motor learning. Motor learning in physical education at the schools, is influenced by several factors, such as: 1) to understand what should be learned, 2) an opportunity to respond, 3) feedback, and 4) reinforcement. Designing motor learning conducted by physical education teachers, should be based on these principles: build progress (extension), pay attention to the quality of student performance (refinement), and provide opportunities for students to apply the skills affect the motor learning.

**Keywords:** design, motor learning, physical education

## **INTRODUCTION**

Physical education is a part of the whole educational process. The essential goal of physical education is the same as the purpose of education in general. The purpose of learning is to produce a change in behavior, as well as the purpose of physical education also to cause a change in behavior. The process of learning to move and learning through movement are the characteristic of physical education. In physical education, students will learn and taught through certain movement in order to achieve the learning objectives. In addition, students are also taught to practice the certain movement. In the physical education, students will be engaged in motor learning.

Motor learning is a series of association training or experience that can change the direction of movement to a certain performance skill. Changes in learning motor skills movement is an indication of the learning process performed by a person. Motor learning in physical education basically include cognitive, psychomotor, affective and physical domain. Cognitive domain is used to study the behavior of movement which include mind-body connection. Psychomotor domain includes process of development, stabilization, and a decrease in physical structure and function of neuromuscular. Affective domain deals with emotions and feelings. Physical domain in motor learning can be divided into organic freshness and physical fitness. In the physical education, students will be involved in motor learning. Motor learning has an important role in physical education. Physical education has two important aspects. The first aspect relates to the efforts to improve the physical abilities and the second aspect deals with



the efforts to improve the quality of the motor. Efforts to improve the physical ability can be done by doing physical activity which refers to the principles of physical exercise (physical training). Meanwhile, efforts to improve the motoric quality based on the principles of motor learning.

Motor skills acquired in motor learning, not only influenced by the maturity of motion, but also factor of motor learning process. The role of physical education teachers is crucial to success in motor learning in physical education at school. Additionally, the success of motor learning is also influenced by the environment, the ability of students, and the tools and facilities. Physical education teachers in the motor learning skills should be able to guide and create an atmosphere that is conducive and supportive, so that the motor learning process can run smoothly and successfully. Physical education teachers should be able to design a motor learning in physical education by adjusting learners' ability. The principles in designing learning materials in the motor must be considered by the teacher before delivering the material to the students.

## **LITERATURE REVIEW**

### **THE NATURE AND THE ROLE OF MOTOR LEARNING IN PHYSICAL EDUCATION**

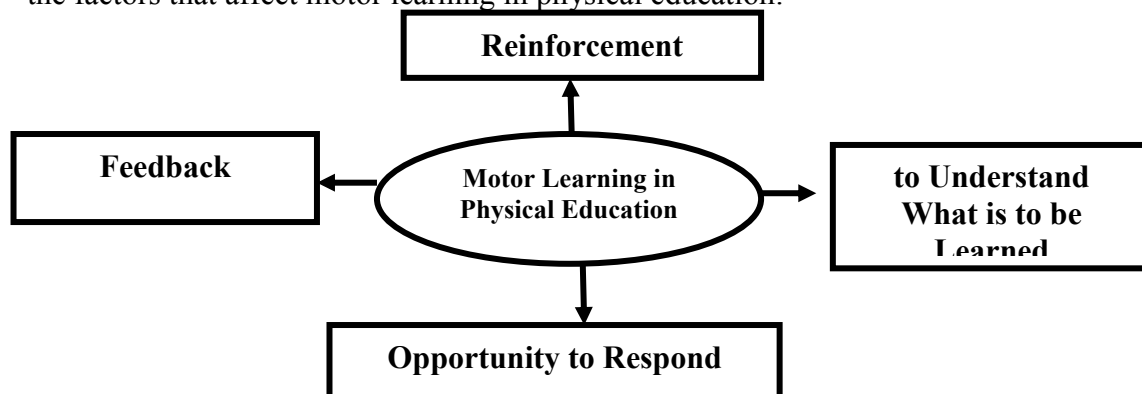
The notion of motor learning can not be separated from the notion of learning in general. Motor learning is a learning process that leads to the dimensions of movement, which is actualized through motor responses which are shown in the movement of the body or specific body parts to improve the quality of movement, (Heri Rahyubi, 2012: 208). According to Sugiyanto (1993: 232) motor learning is a form of learning that emphasizes on something specific, that is for the purpose of improving the quality of body movement. Meanwhile, Schmidt (1991) views motor learning as a set of processes associated with practice or experience leading to a relatively permanent change in a person's ability to show the skilled movements. Someone who does motor learning properly will experience some changes, for example, students who from unskilled become skilled, from unable become able to perform something related to matters of movement and motor. Motor activity here can be in the form of movement in sports, music, art, and other works and professions. From some opinions above, it can be concluded that motor learning is a series of learning process exercises to get change or improve the quality of motion or movement to get more skilled movement

The targetted domains physical education are cognitive, psychomotor, affective, and physical. Motor learning has a very important role in physical education. The role of motor learning in physical education is related to physical and psychomotor domains. According Sugiyanto ( 1993 : 236 ), the role of motor learning in physical education in an effort to achieve such goals: 1) to develop motor skills body, 2) to control of movement patterns of sports skills, and 3) to express personal behavior patterns and interpersonal are both in the game and dance. To achieve the goal of improving the quality of a person's motor skills, the undertaken activities should be based on principles of motor learning. Principles to be considered in motor learning include: **The first principle, a learning exercise and experience influence:** The development of capabilities can indeed be developed without training. The abilities can be developed, for example, because of the influence of maturity and growth. This kind of capability changes will increase the skills, although only up to the minimum level. A simple example of this case is the skill to run. Without practicing in the real practice, the ability to run will keep growing due to the influence of maturity. Any normal child will surely

master the skills of running without having the practice. Changes in children's skills because of the maturity of the children certainly can not be said as a result of learning. This is due to the students' change is not a result of the exercise. From the above definition, it can be said that the change must involve the proper training or the provision of a particular experience. **The second principle, learning is not directly observable:** Many changes in the central nervous system, when the exercise takes place. These changes occur because the weaving motion of various abilities and experiences in the memory systems of the brain. This process is usually solidify the changes to be relatively sedentary. This process generally can not be directly observe. What can be done is to look at the changes that occur through the appearance of the movement. Exercise causes the changes of "panel board" in the brain that are associated with the program movement, so the movement is being performed looks better. **The third principle, the changes are relatively settled:** It is important to believe that exercises are the factors that will affect the appearance. The Changes of the skill will characterize the ability of the person and will be useful when it is needed in certain time. The new capabilities that will be brought wherever the person move.

#### **FACTORS AFFECTING THE MOTOR LEARNING**

Success in motor learning in physical education at school is influenced by several factors. According to Heri Rahyubi (2012: 358), motor learning is influenced by four factors, such as: to understand what is to be learned; the opportunity to respond, feedback, and reinforcement. **The first factor is "to understand what is to be learned"**. This relates to the clarity of the learning goals, which is the skill that must be mastered, is the circumstances in which it should be known by the learners to help achieving the learning effectiveness. In the learning process, this situation is often referred to as a way to give the stimulus. Stimulus factors have a positive impact on the effectiveness of motor learning, especially in physical education. **The second factor is the "opportunity to respond"**. The opportunity to respond is the dominant factor affecting the control when learning process takes place. This refers to the quality response that must be obtained by learners. Sometimes, students have many opportunities to respond during learning process, but they do not show the quality response. **The third factor is "feedback"**. Feedback determines the success of motor learning, without feedback the motor learning will not be successful. The more fixed information given to students in giving feedback, the sooner the student will master the skills of movement. **The fourth factor is "reinforcement"**. It is a series of steps that follow a behavior that increases the chance that the behavior will be repeated. Reinforcement can be done in variety forms, such as: the words used by the teacher, friends' recognition, winning the game, awards, and so forth. Here is a chart to clarify the factors that affect motor learning in physical education:



### **Figure 1. Factors that Affect of Motor Learning in Physical Education.**

Meanwhile, according to Heri Rahyubi (2012: 208), motor learning is also influenced by four factors, they are: the individual, the environment, equipment or facilities, and teacher (facilitator). In terms of individual factors relate to the potential, talent, ability, and willingness of the learner. Environmental factors relate to the matter of whether a place used to conduct the learning process is a conducive environment or not. The equipment or facility factor relates to the availability of tools or infrastructure to support the smooth process of motor learning. While the teacher or facilitator factors relates to the extent to which a teacher is able to guide and create an atmosphere so that the motor learning process can run smoothly and successfully.

### **STAGES OF MOTOR LEARNING**

Fitts and Posner cited by Judith E. Rink (2010: 25) the stages of motor learning, such as:

1. Cognitive stage.  
The learner uses information on how the skill is to be performed to develop an executive/motor plan for a movement skill. Thought processes are heavily involved as the learner consciously attends to requirements of the whole idea of the skill and sequencing the pattern. Student responses are characterized by a high degree of concentration on how to perform the skill. The learner is unable to manage small details of the movement or cope with adapting the movement to environmental changes.
2. Associative stage.  
The learner can begin to concentrate on the temporal patterning of the skill and the refinement of the mechanics of the skill. For most complex skills learner is in this stage a great deal of time. The learner at this stage can profit from feedback and can begin gradually to cope with external demands of the environment. All the attention of the learner does not have to be on every aspect of the performance.
3. Automatic stage.  
The goal of motor learning is for the skill to be performed automatically. At this stage the learner does not have to give cognitive attention on the movement itself. Performance is consistent and can be adapted to the requirement of the environment, such as where to place the ball and defensive players in open skills.

### **DESIGNING AND DEVELOPING MATERIALS MOTOR LEARNING IN PHYSICAL EDUCATION**

Development in motor learning materials should consider several principles. According to Judith E. Rink (2010: 83-85) that the development of good material has the following characteristics:

1. Developing Progress (extension).  
Building progress is an attempt to sort the material from the easier one to more difficult or from simple to complex. Teachers can do this by creating a series of task enrichment. Teacher starts the lesson with the easiest exercises and gradually increase the difficulty level of the exercise. Sometimes, teachers do not increase the level of difficulty of an exercise but find other ways to practice exercise in a different way.
2. Attention to the quality of student performance (refinement).

The teacher's caring on the quality of student performance can be shown by giving good feedback on the overall performance of students in a class or individually.

3. Provide opportunities for students to apply skills (application)

Teachers should provide opportunities for students to apply what they have learned so that both teachers and students can determine the level of students' understanding of the material. Exercises that give students the opportunity to practice often referred to as an applied practice. Teachers usually start learning by providing informing task. From this informing task, teachers develop materials by integrating three other materials development principles: 1) extension: the arrangement of the material from the easier to more difficult, 2) refinement: focusing on the quality of students' performance, and 3) application: the application of skills learned

Analysis of material development helps teachers to provide appropriate training and sequentially material. This analysis helps teachers to identify the characteristics of a good performance and to integrate applied practice. The analysis begins by identifying the aspects of development progress (extension) of a skills development. In developing learning materials, physical education teachers should be able to show the existence of improvement and progress. At this stage, teachers formulate how to reduce the level of difficulty and complexity of the materials to the students and to develop the parts that would be the sequence of a practice. Here are the factors to be considered in analyzing the development of learning material in physical education:

1. Exercise from each section: the teacher can reduce the level of difficulty of the exercise by dividing the exercises into several parts and having students practice these parts before finally practicing the exercise as a whole.
2. Modification of equipment: the teacher can modify the exercise equipment to facilitate the students do the exercises. Modification of sports equipment is highly recommended when teachers teach small children where the size of the equipment is not proportional to their body or when teachers teach beginner students, at any age, who have not had a good ability to use equipment with actual size.
3. Structuring space for practice: the teacher must adjust the space with the material that will be learned.
4. Focus on the purpose of the performance: the orientation of the goal of an exercise can have a strong influence on how students performed a skill.
5. Performance characteristics: a requirement of a performance that can increase or decrease the level of difficulty of the material is specific materials. In some circumstances it can be manipulated, the following requirements may be modified to increase or decrease the level of difficulty
6. Changing the rules: the level of difficulty of a practice can be increased or decreased by manipulating the rules of sport activities. The rules are requirements that limit the performance/movement of a game. Game rules can be modified if such regulations interfere with the game naturally.
7. The number of combined skills: the teacher must consider how a skill is used and prepare students for a variety of ways in which these skills are used with other skills.
8. Development of the number of different responses: in the development of the concept of learning, the ultimate goal of teaching is to make students able to apply the concepts they have learned into practice activities. The development of practical skills will develop a practice that help students to understand a concept and expand

the number of appropriate responses and asks the students to practice what they have learned.

9. Improving quality improvement: this aspect answers the question "how to practice well?" Here is a quality improvement process stage: identifying the instructions that can be used by teachers during the presentation, things to consider when observing the practice of student teachers, and provide information that will be used when giving feedback to students. In the actual learning process, when the students' practices do not meet the criteria, the teacher has several options: fix the practice of any individual if possible, make the task easier, and stop the class and focusing on the instructions for all students to improve their performance.
10. Designing assessment practice: at this stage, teachers prepare analysis columns of practices assessment that describe the development of performance activities. It can help students to apply their improved skills to the changed situation by shifting the focus from how to use these skills or assess these skills. Here is an example of the application of applied exercise: self-assessment (individual/pair), self-assessment (group), competition, judging performance using the criteria.

### APPLICATION OF MODIFIED IN MOTOR LEARNING

Motor learning should reflect the principles of Developmentally Appropriate Practice (DAP). DAP principles emphasize that the given task should pay attention to changes in the ability of children and can help develop these changes. Thus, the teaching assignment must correspond with the level of development of students who are learning. According to Yoyo Bahagia and Adang Suherman (2000: 1), the essence of the modification is to analyze and develop the learning materials in a sequence way in learning activities that can potentially facilitate students in learning. It is intended to guide, direct, and teach students who are unable to do to be able to do, from being in lower level to be in a higher level.

Physical education teachers must have knowledge of the analysis of modifications in motor learning. According to Yoyo Bahagia and Adang Suherman, (2000: 2) some aspects that can be analyzed in modifications include:

1. Modification of the learning goals.  
Modification of the learning objectives relates to the goal of learning from the lowest highest goal. The modification of material goals is done by: **expansion goals**: learning objectives that emphasize on the acquisition of knowledge and the ability to perform the skills regardless the essence and effectiveness aspects. **Smoothing goals**: learning objectives that emphasize on the acquisition of knowledge and ability to perform efficient movement of the learned skills. **Application goals**: the purpose of learning that emphasizes the acquisition of knowledge and ability to perform the effective movement or learned skills.
2. Learning materials modification  
Modification of learning materials relates to learned skills, which includes: **Skill Component**: modifying the skills can be done by adding/reducing the level of complexity and difficulty. Example: analyzing and dividing the overall skill into some parts, then train it each part before doing the whole exercise. **Materials classification**: modifying skill by increasing/decreasing the level of complexity and difficulty based on the skill classification. **Appearance condition**: modifying the conditions of student performance by reducing or adding levels of complexity and difficulty. Example; increasing/decreasing the level of speed, doing in a place or

moving forward or in any direction. **Total skill:** decreasing or increasing the level of complexity and difficulty by combining movement or skill. Example: running while dribbling a basketball, shooting while jumping. **Expanding the number of different responses:** adding the level of complexity and difficulty can be done by increasing the number of different responses to the same concept. Example: the concept of prefix length and strength.

3. Modification of the learning environment.

Modifications can be attributed to the learning environment of learning, which includes: equipment, space arrangement in practice, and the number of students involved.

4. Modification of learning evaluation.

Modification of learning evaluation activities includes the preparation of the study focused on the evaluation of student skills already learned in a variety of situations. Evaluation activities may change the focus of students' attention on how the skills should be done into how those skills are used or what the purpose of that skill is. Some modification forms of evaluation include: self-testing (individual or pairs), self-testing (group / group), and the match

## GIVING TASK PRACTICE TO STUDENTS

Giving practical work to students should use the proper way to give students a complete overview of the skills that will be studied, including the provision of a description of how the skill performed. According to Agus Mahendra (2007: 6) some things that need to be considered in giving practical work for students, such as, regarding to how to give instruction and modeling/demonstration:

1. Giving instruction.

Giving instructions is a common thing in almost every teaching. Instruction is usually spoken (although it can also be written, and provides information about the most important aspects of a skill. Too much information will soon be forgotten, and also note that the information in verbal form was sometimes limited by the accuracy and truth. Therefore, the instructions given should be short and to the point, emphasizing only one or two general concepts. Furthermore, according to Judith E. Rink (2010: 72), a good command has some characteristics, such as: accurate, it is important to the task practice being described, brief, and appropriate with the age and ability level of students. Singer (1980) cited by Agus Mahendra (2007: 7) notes that giving these instructions must include the following four things: constantly giving instruction and direction, only used as a technique of pre-exercise value transfer (pre-training), encouraging students to respond to the particular sign at the time of certain time, and offer corrective advice on appearance is concerned.

2. Modelling and demonstration.

The best media in delivering instruction before students perform a movement task are visual aids, such as a true picture of a technique or skill, movie clips, video, or demonstration by peers or by teachers themselves (modeling). Information about skills in this way is not limited by the use of words, but strengthened with a vivid description of the movement to be studied. According to Judith E. Rink (2010: 72), in providing a task demonstration to the students, teachers should consider several principles: demonstration should be accurate, demonstration should be done by students, demonstration should be in the correct movements, emphasizing the

important information of an exercise, explain why the exercise is done, check the students' understanding after the demonstration, and demonstration should be performed more than once. Agus Mahendra (2007: 9), explains that in order to optimize the demonstration, the teacher should be guided by four things: the students should be made aware to observe the examples given with full attention, the teacher must deliver optimal information that can be processed by the ability of students, the demonstration will give a better effect if repeated more than once, and it is helpful to be able to show a demonstration in the form of films.

## **CONCLUSION AND SUGGESTION**

The learning of school physical education is related to motor learning. Motor learning in physical education at schools provides the opportunity for students to get relatively permanent change in a person's ability to show the skilled movements. Material or movement in the motor learning task given by the teacher must be designed appropriately and correctly so that the learning goals can be achieved successfully.

Designing motor learning in schools which conducted by teachers, should pay attention to these several things: the factors that affect motor learning, motor learning principles, stages of motor learning, considerations in developing materials or motion tasks to students, giving the task to the student movement and the application of the modification in motor learning.

## **REFERENCES**

- Agus Mahendra (2007). *Teori Belajar Mengajar Motorik. (Modul)*. Bandung: FPOK UPI Bandung.
- E. Rink, Judith. (2010). *Teaching Physical Education for Learning (Sixth Edition)*. New York: Mc Graw Hill.
- Heri Rahyubi. (2012). *Teori-Teori Belajar dan Aplikasi Pembelajaran Motorik*. Majalengka: Referens.
- Sugiyanto, dkk. (1993). *Belajar Gerak*. Jakarta: Depdikbud, Proyek Peningkatan Mutu Guru SD Setara D-II dan Pendidikan Kependudukan, Bagian Proyek Penataran Guru Penjas dan Kesehatan SD Setara D-II.
- Schmidt, Richard A. (1991). *Motor Learning and Performance: From Principle into Practice*. Human Kinetics. Champaign, IL.
- Yoyo Bahagia dan Adang Suherman. (2000). *Prinsip-Prinsip Pengembangan dan Modifikasi Cabang Olahraga*. Jakarta: Depdikbud, Dirjen Pendidikan Dasar dan Menengah, Bagian Proyek Penataran Guru SLTP Setara D-III.

# GAME VOLLEYBALL PREPARING ATTACK FOR SPORT AND HEALTH EDUCATION LEARNING FOR FIRST CLASS IN JUNIOR HIGH SCHOOL

Yuyun Ari Wibowo

Yogyakarta State University, Indonesia

## Abstract

Title of this research is game volleyball preparing attack for Sport and Health Education learning for first class in Junior high school. This research based on volleyball learning process with drill method commonly makes students bored. Playing type is to be on of the alternative to disappear saturation. Purpose of the research develops game volleyball preparing attack. This research is a development. Development is done through phases: preliminary design, production, evaluation, and revision. After going through the initial stages of production resulting products were validated by experts material. Furthermore, the products have been tested on students through the testing phase of small and large scale. Product trials are subject class VII student of SMP N 2 Kasihan. Data were collected through observation. Data in the form of product quality assessment, suggestions for product improvement. Quantitative data were analyzed with descriptive statistics. The suggestions obtained is used as the basis for revising the product. Results of the study is the formulation of a model for the volleyball game preparing attack sport and physical education teaching health class VII. The model of the game is: (1) *passing* dari bola pantul, (2) *passing* pantul serang, (3) *passing* tangkap serang, (4) *passing* tangkap lalu serang dengan *passing* bawah.

**Keywords:** game, prepare for an attack, volleyball.

## INTRODUCTION

The learning process of physical education and health sport synonymous with the active role of the learner. Active learners in the learning process is now questioned because often encountered students who just sit around during the learning process. Issues about activity learners being a hot issue for the students raised in the final thesis. The existence of learners who do not want to come or queue activity and rest make less than the maximum optimization study time. Even worse if the students also behave passively in their daily life, then fitness will be very difficult to be realized.

Optimization of time in the learning process to be one thing that is very important in the educational process. Time for physical education subjects in junior sport and health are 2 x 40 minutes. The question is: can utilize the time available to continue the move. Unpleasant activity will certainly not be able to make the students want to do it in a longer period of time, so the shade, lounging, and do other activities besides the subject matter is the choice. An example is the passing down of learning for students of class VII, drill approach, by being asked to do in a portion of the lot and a long time will make learners are easily bored and consequently some of the above. So we need a way to be able to optimize the learning time.

The game is one way that can be used for physical education to learn sports and health. The game also as one of the preferred activities. Proof that games are a nice



thing is when learning of physical education and athletics own health, when the teacher asked today want to learn what? The answer would have been a lot of students who answered play soccer, volleyball, or another game. Game has a number of advantages to active learners. Learners can be active with the game because the game will make them challenged and feel curious.

The game can make students more excited, because there are competitive elements. Competitive element of the game can influence the participants to continue the game. Someone that play and defeat a little or thin certainly still felt could win the game.

Physical education and sports health much use sports games as the material. Examples of sports games that are used in physical education and health sport is football, basketball, volleyball, and others. Volleyball game is one sport that takes a long time to be able to play it.

Learn to play volleyball with the drill method often makes the students become bored. Form of play to be one alternative to relieve boredom. Form of play is also believed to be able to make the students feel challenged. Learn to play volleyball with mini-game form of actual game will also help learn the supporting techniques.

Learn to play volleyball get through techniques or tactics. The basis technique of the volleyball game is service, passing down, passing on, spike and block. Tactics that are in the volleyball game can be grouped in two things; tactics of attack and defense, and can also be distinguished on individual and group tactics. One of the defense tactic is to prepare the attack. Preparing attack tactic is a tactic used to produce a good passing to get lured easily. Preparing attack tactic in the volleyball game there some sort.

Learners in junior class VII generally will get a volleyball game in odd and even smester. Volleyball game first taught in junior high school is the basic technique. The initial basic technique is given in general is passing. The main function of passing is to prepare the attack. Preparing for an attack is a problem of tactic in the volleyball game. Researchers associated with this expansion will do to make a game with volleyball preparing attack tactic for class VII students.

## **METHODS**

### **1. Development Model**

This research is a development research. According to Borg and Gall (1983:) research and development is a process used to develop or validate the products are used in education and learning. Development carried out to get a game to prepare an attack.

### **2. Procedure Development**

The procedure to prepare the attack volleyball game development is in accordance with the steps of research and development according to Borg and Gall. According to Borg and Gall (1983: 222) in conducting research development, there are several steps that must be taken, the steps that must be taken as follows, (1) an analysis of the information that has been collected, (2) plan research, (3) developing initial products, (4) expert validation and revision, (5) with small-scale field trials and revisions products, (6) large-scale testing and revision of the product. development measures according Wasis Dwiyo D. (2004: 6) is: (1) performs the analysis of the product to be developed; (2) developing initial products; (3) validation of the expert; (4) the trial court, (5) revision of the product.

Based on the development steps of Borg and Gall then researcher planned research steps as follows:

- a. Analyze of the information gathered.
- b. Develop the initial product.
- c. Expert validation and revisions.
- d. Field trials and revisions with small scale or large scale and revision.
- e. The result of the evaluation made by the experts are then used as input material for researcher to improve the models that have been compiled and then having to do revision / improvement, then do a test model in a larger scale.

### 3. Testing Products

Product trials meant to collect data as a basis in determining the goodness of the model developed. Here is a description of the trial design of the product, subject try, data type, data collection instruments, and data analysis techniques.

#### a. Product Trial Design

Trial design is intended to get direct feedback from users about the quality of the developed model. This study will test the model draft done twice, that is small-scale trials and large-scale trials / wide. Before any testing both small and extensive prior validation requested experts as well as physical education teachers.

#### b. Subjects Try

Subjects try involved in this study were students in SMP N 2 Kasihan Bantul. Then according to the stages of research for a small-scale trial involving 12 students and a large-scale trial involving 32 students.

#### c. Data types

Data collected from this study is data from experts, teachers, and students. Data from the experts and teachers using a questionnaire to assess the quality of the quality of the learning model before field testing. Data small-scale field trials, and wide scale resulting from the observation that given the expert and teacher while observe the implementation of the trial that has been documented. The data obtained from the student questionnaires after students attend trials on a wide scale.

#### d. Data Collection Instrument

Data collection instrument in this study is questionnaire then made a survey of assessment tools from 2 consultants / experts and a junior high school sports and health education teachers. Instruments for field trial using the guidelines is expected to offer observations reveal the opinion of the experts and sports and health education teachers. Questionnaire and observation guidelines using questionnaire and observation Ahmad Rithaudin guidelines on research with the title "game model in the water as a learning medium physical education for elementary school children of the underclass". Questionnaire and observation guidelines used because basically that is developed is just the same that is a game, and games are arranged or produced for the learning of physical education.

#### 4. Data Analysis Techniques

Data analysis techniques in this study using descriptive data analysis. There are two kinds of descriptive data analysis performed in this study namely: descriptive data analysis of quantitative and qualitative. Quantitative data analysis is done to analyze the data and the observation of experts and teachers on the quality of the model prior to the field trials. Qualitative analysis was conducted on data from the observations of experts and sports and health education teachers in providing advice or input as well as revisions to the model are arranged mainly in the field testing stage both small scale and large scale.

### RESEARCH AND DEVELOPMENT

Data obtained from the questionnaire filling of sports experts and teachers a guide to state models made feasible or not. The results of the questionnaire by experts and teachers can be seen in table 1 below.

**Table 1**  
**Recapitulation Data Questionnaire Results of the Experts in the Draft Model.**

No	Model type	Experts Assessment Score			Total Score	Average Score
		A.1	A.2	G.1		
1	Permainan <i>Passing</i> dari Bola Pantul	64	66	63	193	64,33
2	<i>Passing</i> Pantul Serang	65	66	62	193	64,33
3	<i>Passing</i> Tangkap Serang	65	64	62	191	63,67
4	<i>Passing</i> tangkap lalu Serang dengan <i>passing</i> bawah	63	62	60	185	61,67

#### Information

A.1 : Expert 1

A.2 : Expert 2

G.1 : Teacher

Based on data from Table 1 above it can be concluded that the models are feasible for small-scale performance tested. It can be seen from the average score across the experts and teachers are above a score of 45 as the limit of the receipt of a model. The mean score drafts 1, 2, 3 and 4 above 45 then the draft prepared declared eligible to be tested.

The following are inputs to the model are established: (1) clarify the whole sentence in the model developed, (2) The purpose of the game should be clarified, (3) classroom management should be able to accommodate all learners to learn, (4) passing principles incorporated under the laws volleyball.

As for the advice and input from the observation of the small and large scale are: (1) after catching the ball should be able to run forward while bringing the ball to be ferried, (2) area for the proposed service to be 3 feet from the rear, and 3, 5 from the side lines.

Research by title volleyball game preparing attack on sports and physical education teaching health class VII produces four kinds of games namely: (1) *Passing* dari Bola Pantul, (2) *Passing* Pantul Serang, (3) *Passing* Tangkap Serang

dan (4) *Passing* tangkap lalu Serang dengan *passing* bawah. As for a more detailed explanation of the above games are as follows:

1. *Passing* dari Bola Pantul

**Table 2**  
***Passing* dari Bola Pantul**

GENERAL INSTRUCTIONS		
Name Game	<i>Passing</i> dari Bola Pantul	
The game goal	Increase the frequency of doing <i>Passing</i> , as well as correcting the basic techniques of passing down.	
Facilities and Infrastructure	1	volleyball court, size 18 x 9 meters.
	2	Net
	3	Ball, size 4
Time	25-30 Minutes	
Rules of the game	1	Service replaced by the bottom two-hand throw, in the service area. The service area is an area of 2 square meter box that is 3 meters from the rear line of volleyball field and 3.5 meters from the side lines volleyball court.
	2	Games with 6 vs 6
	3	Earn points when team opponent can not return the ball beyond the net.
	4	System point is relly point.
	5	Reach 25 points first is the winner.
	6	Ball from the opposing team assault as a result the service or when relly should reflect to the floor first than allowed to be passing down.
	7	The ball from passing down should bounce then allowed captured by another member of team and than allowed to attacked to the opposing team. Allowed to bring the ball forward before pass the net.
	8	Ball attacked to the opponnent's field must pass over the net with a height of 2 meters. The throw is used with two hands from below.
	9	Not allowed to take across the ball thrown from the shoulder and using one hand.
	10	Rotation is rotation used in official volleyball game.
How to make a game	Start the game using the two-handed shot as a substitute service, in the service area. Ball result of past service on the net should be bouncing on the floor before passing down. Passing down results should also reflect on the floor first before being caught and space attacked to the opponents. Ball results throw down a two-handed should pass over the net and fell in field opposite. Team which win the relly earn points.	

1. *Passing pantul serang*

**Table 3**  
***Passing pantul serang***

<b>GENERAL INSTRUCTIONS</b>	
Name Game	<i>Passing Pantul Serang</i>
The game goal	Increase the frequency of doing Passing, passing under the correct basic techniques, as well as creating a simple rally in playing volleyball.
Facilities and Infrastructure	1 volleyball court, size 18 x 9 meters.
	2 Net
	3 Ball, size 4
Time	25-30 Minutes
Rules of the game	1 Service replaced the bottom two-hand throw, in the service area. The service area is an area of 2 square meter box that is 3 metse from the rear line of volleyball field and 3.5 meters from the side lines volleyball court.
	2 Games with 6 vs 6
	3 Earn points when team opponent can not return the ball beyond the net.
	4 System point is relly point.
	5 Reach 25 points first is the winner.
	6 The ball from the other side of both servicing and attack results when relly should direct passing.
	7 Passing the ball must bounce first then allowed to captured by a another member of team then allowed to attacked to the opposing team.
	8 Ball attacked to the opponnent's field must pass over the net with a height of 2 meters. The throw is used with two hands from below.
	9 Not allowed to take across the ball to be thrown over the shoulder and using one hand.
	10 Throw the ball fall on the ground opponnent in the attack line until mid-line is considered out.
	11 Rotation is rotation used in official volleyball game.
How to make a game	Starting the game with a two-handed throw-down instead of a service, in the service area. Service that passes the ball over the net should direct passing. Passing the ball must bounce on the floor first before being captured. Throw the ball down the two hands must pass over the net and fell field opponents. Balls are dropped on the ground opponnent from attack line until mid-line is considered out. Team that wins the rally earn points.

## 2. *Passing Tangkap Serang*

**Table 4**  
***Passing Tangkap Serang***

GENERAL INSTRUCTIONS		
Name Game	<i>Passing Tangkap Serang</i>	
The game goal	Increase the frequency of doing Passing, as well as creating a simple rally in playing volleyball.	
Facilities and Infrastructure	1	volleyball court, size 18 x 9 meters.
	2	Net: Height: 200 cm
	3	Ball size 4
Time	25-30 Minutes	
Rules of the game	1	Service replaced the bottom two-hand throw, in the service area. The service area is an area of 2 square meter box that is 3 meters from the rear line of volleyball field and 3.5 meters from the side lines volleyball court.
	2	Games with 6 vs 6
	3	Earn points when team opponent can not return the ball beyond the net.
	4	System point is relly point.
	5	Reach 25 points first is the winner.
	6	The ball from the other side of both servicing and attack results when relly should direct passing.
	7	Passing the ball immediately captured by a team of friends to attacked the opponent field.
	8	Ball attacked to the opponnent's field must pass over the net with a height of 2 meters. The throw is used with two hands from below.
	9	Not allowed to take across the ball to be thrown over the shoulder and using one hand.
	10	Throw the ball fall on the ground opponnent in the attack line until mid-line is considered out.
	11	Rotation is rotation used in official volleyball game.
How to make a game	Starting the game with a two-handed throw-down instead of a service, in the service area. Service that passes the ball over the net should direct passing. Passing the ball then caught and passed over the opponent's net spaciousness. Throw the ball down the two hands must pass over the net and fell field opponents. Ball fall on the ground opponnent in the attack line until mid-line is considered out. Team that wins the rally earn points.	

3. *Passing tangkap lalu Serang dengan passing bawah*

**Table 5**

***Passing tangkap lalu Serang dengan passing bawah***

GENERAL INSTRUCTIONS		
Name Game	<i>Passing tangkap lalu Serang dengan passing bawah</i>	
The game goal	Increase the frequency of doing Passing, as well as creating a simple rally in playing volleyball.	
Facilities and Infrastructure	1	volleyball court, size 18 x 9 meters.
	2	Net: height: 200 cm
	3	Ball, size 4
Time	25-30 Minutes	
Rules of the game	1	Service replaced the bottom two-hand throw, in the service area. The service area is an area of 2 square meter box that is 3 meters from the rear line of volleyball field and 3.5 meters from the side lines volleyball court.
	2	Games with 6 vs 6
	3	Earn points when team opponent can not return the ball beyond the net.
	4	System point is relly point.
	5	Reach 25 points first is the winner.
	6	The ball from the other side of both servicing and attack results when relly should direct passing.
	7	Passing the ball caught before touching the floor, and then passed to another friend of the team with throw hands from below.
	8	Ball attacked to the opponents with passing.
	9	Ball attacked to the opponents must pass over the net with a height of 2 meters.
	10	Throw the ball fall on the ground opponnent in the attack line until mid-line is considered out.
	11	Rotation is rotation used in official volleyball game.
How to make a game	Starting the game with a two-handed throw-down instead of a service, in the service area. Service that passes the ball over the net should direct passing. Passing the ball before it touches the floor had to be captured after that throw with two hands for the next passing by a friend to passed to the opponent's field. Team that wins the rally earn points.	

## CONCLUSION

Based on our results, it can be concluded that is arranged volleyball preparing attack model for learning Sports and Health Education Class VII. Models of this game is as following settings: (1) *Passing* dari Bola Pantul, (2) *passing* pantul serang, (3) *Passing* Tangkap Serang dan (4) *Passing* tangkap lalu Serang dengan *passing* bawah.

## REFERENCES

- Borg W. R. & Gall M. D. (1983). *Education Research*. Fourth edition. New York: Longman Inc.
- Wasis D. D. (2004). *Konsep penelitian & pengembangan*. Makalah disajikan pada lokakarya Metodologi penelitian pengembangan di UNY, 19-20 Juli 2004.



# **THE UNDERSTANDING LEVEL OF TACTIC AND STRATEGY OF BASKETBALL GAME IN PJKR STUDENTS OF FIK UNY**

**Tri Ani Hastuti**

**Yogyakarta state University, Indonesia**

## **Abstract**

Besides physical, tactical, and mental factors in playing basketball, there is an understanding about tactics to be implemented appropriately while playing. This research aims to determine the level of students' understanding of tactics and strategies in basketball game of PJKR Study Program in Faculty of Sport Science Yogyakarta State University. The research is a descriptive research using survey method. The technique of the research is taken by test. The research sample uses purposive sampling of students of PJKR B 2011 FIK UNY for 42 students. The research instrument uses a test instrument. The results indicate that the instrument validity test of 25 question items, 3 items found invalid so it is 22 items taken and has a valid question reliability coefficient of 0.864. The analysis uses quantitative descriptive statistical analysis as outlined in the form percentage. The research results show that the level of PJKR B 2011 FIK UNY students' understanding of the tactics and strategies in the game of basketball are 3 students (7.14%) have the "very low" understanding, 3 students (7.14%) have "low" understanding, 4 students (9.52 %) have "medium" understanding, 14 students (33.33 %) have "high" understanding, and 18 people (42.86 %) have "very high" understanding.

**Keywords:** understanding, tactic, strategy, basketball

## **INTRODUCTION**

Sports game of basketball is a sport that involves all fitness movement; a good player would require good physical, technical, tactical and also mental. Applied learning methods should also enable learners actively involvement and participatory. By applying this method, the students are expected to have the freedom to develop all the power of intelligence to understand critically. Similarly, an evaluation is given to the evaluation process and no longer evaluation model that makes the students feel dictated and have to memorize something without an opportunity to provide their opinions and arguments.

The process of learning game of basketball in PJKR course refers to the applicable curriculum, the content or the content material should really be selected and adapted to the progress of science and the needs of stakeholders that are always dynamic. Nevertheless, the process of learning the game of basketball are faced with problems in implementation so that it will hinder the achievement of the course goals. On the other hand, weaknesses and constraints in the implementation of a curriculum rooted in different perceptions between components executing, as well as the diversity of ability in translating curriculum into operational form of learning. By presenting learning material that can not be separated from each other, then it is expected to form an integral personality learners who lives in harmony with its surroundings.

Understanding has a very important meaning in every execution of a task or job. Knowledge will not be meaningful in the application if it is not supported by an understanding of the knowledge itself. It is similar with an understanding that will have no meaning or achieved if there is no previous existing knowledge. Based on Kamus Besar Bahasa Indonesia (2001: 811), understanding means process, way, how to understand or to give understanding. Anas Sudijono (2007: 50) adds, understanding is the ability of someone to understand and comprehend something after it is known and remembered.

Understanding according to Anderson and Krart cited by Pujiarto Wahl (2006: 21) is to translate, describe, interpret, simplify, and make calculations, in other words, educators can explain the new idea or concept. To understand is an ability that is more than just know. According to Wahyu Baskoro (2005: 235) cited by Pujiarto (2006: 22) understanding is a process of creating ways how to understand or implant and to give comprehension. Giving understanding is fixing the good things so other people can understand, comprehend, and implant understanding.

Atmojo Noto (1993: 141) says that to know is first stage before coming to the next stage:

- a. Know, defined as the ability to remember the material they have learned.
- b. Comprehension or comprehend, defined as an ability to explain properly about the objects that are known and can correctly interpret the material.
- c. Applications, defined as the ability to use materials that have been studied on the actual situation or condition.
- d. Analysis, interpreted as the ability to describe a material or an object into components but still in an organizational structure, and still has something to do with each other.
- e. Synthesis, meant an ability to devise new formulations of old formations.
- f. Evaluation, interpreted as the ability to justify or assessment of a material or object.

Based on the description above it can be concluded that after the process of understanding, someone is expected to comprehend about something that has been learned or known. In this research understanding is interpreted as ability to explain something that has been studied previously and can interpret correctly.

The game of basketball is a team game that uses a big ball. The ball size 7 for men and size 6 for women both in adolescent and adult categories. Basketball is played by two teams in the field facing each other with each team consists of five players. The goal of playing this game is to put the ball into the opponent's basket as much as possible and try to defend themselves from opponent's attack. The characteristics of this game is to play the ball by using the whole body.

Hal Wissel (1996: 2) says that basketball is a game played by two teams with five persons per team in order to get the point (score) by inserting the ball into the opponent's basket and prevent their opponent doing the same. They can play the ball by passing, dribble, shoot and rebound. Based on PERBASI (2010: 1) definition of basketball is a game played by two (2) teams, each consisting of five (5) players. The goal of each team is to score a basket opponent and trying to prevent the opponent scored. The match is led by the referee, the desk clerk and the commissioner, if present. Based on the definition above, it can be concluded that basketball is a game between two teams, each team consisting of 5 persons with goal to score as much as possible and trying to block your opponent to score at a specified time.

To win the game it is needed sportive way, because sometimes a team has the physical and technical superiority, but not how to implement it so they will be defeated, this is called tactic (Djoko Pekik Irianto, 2002: 90). Based on Kamus Besar Bahasa Indonesia, tactic is a systemic plan or action to achieve the goal.

Tactic is an activity that is based on human reason or human psyche. It can also be called as strategy. Problem of tactic should be solved by a team as a whole and by each individual player. The success of each player to solve the tactics problem will help to the success of tactical situation.

Based on some definitions above, it can be concluded that tactic is a way to win the game in sportive way based on capabilities of his team and opponents faced. Tactic is a strategy or idea on how to apply the techniques that have been mastered in playing to attack the opponent for the win, or in other words, tactic is a way used to penetrate the opponent's defense based on the ability he has. In applying tactic needs requirements such as physical condition, technical ability, mental stability, and intelligence of the player. The tactic applied when the game is played.

In doing or using tactic that will be taken to face an opponent in a game, players and coaches should consider the following factors:

1. The ability to think of a player or team
2. The ability of the team: physical health, skills, mental, maturity and experience to compete.
3. Strengths and weaknesses of the opponent.
4. Game situation (referees, officials, spectators, tools, facilities, grounds, weather patterns and game systems, rules, where the game etc.).
5. Tactic that ever applied to similar situations.
6. Non-technical conditions (opponent tactic, terror / psychological opponent or spectator)

According to Djokok Pekik Irianto (2002: 94) there are four stages of how to do the tactic, namely :

1. Stage perception (Perception)

Perception is result of observation when the match is playing. Perception expands opponent's concentration of observations and other acts that related to the position of teammate. Concentration is very necessary at this stage, because before taking action an athlete must observe the performance of the opponent and environmental conditions.

2. Phase Analysis (Analysis)

Analysis is done on the situation movements obtained from observations on the perception stage. Correct analysis is a successful solution toward implementation of the right tactic task.

It depends on the power of thinking, mental processes, so an athlete is required to have sufficient intelligence. For a short time he has to be able to analyze situations and solve problems in the game soon.

3. Phase completion mentally (Mental Solution)

This stage is carried out by observation and analysis of the situation of the match. The goal of mental solution is to find the most efficient way taken by consideration of any risk happens.

4. Completion motoric phase (Motor Solution)

Solving it is the final step of the motoric phases tactic, the success of this stage is determined by the skill of the athlete. If the athlete fails in this stage, he should

immediately conduct an evaluation to the next stage of tactic in other situations. Stages tactic are done in a very short time and the changing circumstances so the playing experience factors will determine the success of choosing tactic. It is possible for the player having physically and techniques weaknesses, but can win the game because he is able to apply the best tactic.

Strategy is an accurate plan regarding activities to achieve specific goal. Strategy is done before the game starts. Strategy is a way or idea that used just before the game started to look for wins in a sportive way ( Djoko Pekik , 2002: 90 ). Roji (2012 : 6 ) says that strategy is a way or idea used or prepared before the game and it is a plan that used to face a game .

Strategy and tactic are arguably the two things complement each other and can not be separated from each other. As an illustration in a basketball game, the coach instructs his strategy to win the team's defense strategy with tactic he uses by keeping an opponent with a man to man full court press with a pattern of 1 to 1 , then blocking tactic are done by every attacker and other tactic that support the strategy of attack. It means that a strategy must be aligned with the tactic used in achieving a goal of winning the team and vice versa, because if the strategy and tactic can not be aligned, goals expected will be very difficult to achieve .

Precision in applying tactic and strategy will determine the success of a team in a match, so it needs to be prepared carefully, sometimes a coach trying to "peek" game potential opponent before the match. Djoko Pekik Irianto (2009: 91) distinguishes between tactic and strategy as follows:

**Table 1. Differences of Tactic and Strategy**

Tactic	Strategy
1. Done when playing 2. Role of player is more dominant 3. Activity form: a. Effectively solving strategy according to the situation b. See, decided to act quickly c. Tactics is sometimes incompatible with strategy prepared	1. Done before the match 2. The role of coach is more dominant 3. Observations the power of potential opponent 4. Activity form: a. Observations opponents' weaknesses and strengths b. Exercise effectively and efficiently to establish a pattern and playing system. c. Adaptation to the environment d. Problem solving based on prediction.

## RESEARCH METHOD

This research is descriptive quantitative research, a research that has met the scientific principles that concrete/empirical, objective, measurable, rational and systematic (Sugiyono 2006:13). The objective of this research is to assess or measure the students' understanding of tactic or strategy in playing basketball. The method used in this research is a survey instrument to use in retrieving the data from the test sample.

The population of the research are PJKR FIK UNY students who took the course in semester 2 basketball game. The samples are PJKR B students class of 2011, amounting to 42 who are taken using purposive sampling approach in the implementation of the course using the tactic and physical education. This research uses

a test instrument. The results indicate that the instrument validity test of 25 question items , 3 items found invalid so it remains 22 items and has a valid question reliability coefficient of 0.864 . Data analysis using descriptive quantitative statistic as outlined in the form of a percentage.

## RESEARCH RESULTS AND DISCUSSION

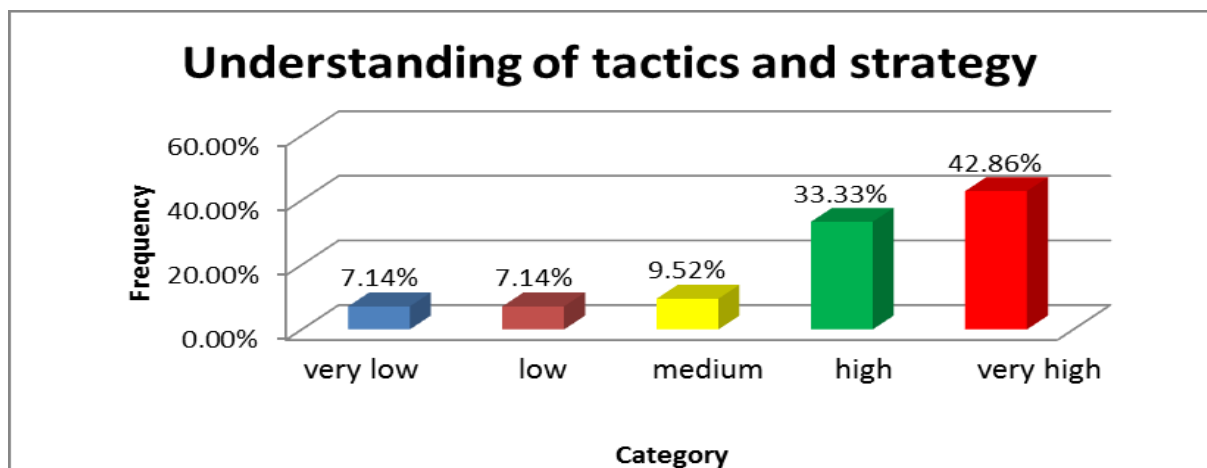
### Results of the research

This research is descriptive research, so the condition of the object will be drawn in accordance with the data obtained. Overall, the obtained maximum score = 22; minimum score = 0; mean = 15.05; standard deviation = 5.15; median = 16.00; and modus = 16.00. Based on the calculation above, the frequency categories distribution of students' understanding of the tactic and strategies PJKR B 2011 UNY in the game of basketball can be seen in Table 1.

**Table 1. Frequency Category Distribution of Students' Understanding of Tactic and Strategy in 2011 UNY in PJKR B Basketball Game**

NO	INTERVAL SCORE	CATEGORY	FREQUENCY	PERCENTAGE
1	>16.50	Very High	18	42.86%
2	12.84-16.50	High	14	33.33%
3	9.18-12.83	Medium	4	9.52%
4	5.51-9.17	Low	3	7.14%
5	≤5.50	Very Low	3	7.14%
Total			42	100.00%

Based on the table above, the understanding of tactic and strategy of UNY 2011 FIK PJKR B students in the game of basketball: 3 students (7.14%) are very low, 3 students (7.14%) are low, 4 students (9.52%) are medium, 14 students (33.33%) are high, and 18 students (42.86%) are very high. When illustrated in a bar chart, as follows:



**Figure 1. Bar Chart Understanding of Tactic and Strategy of UNY PJKR B Students in Playing Basketball**

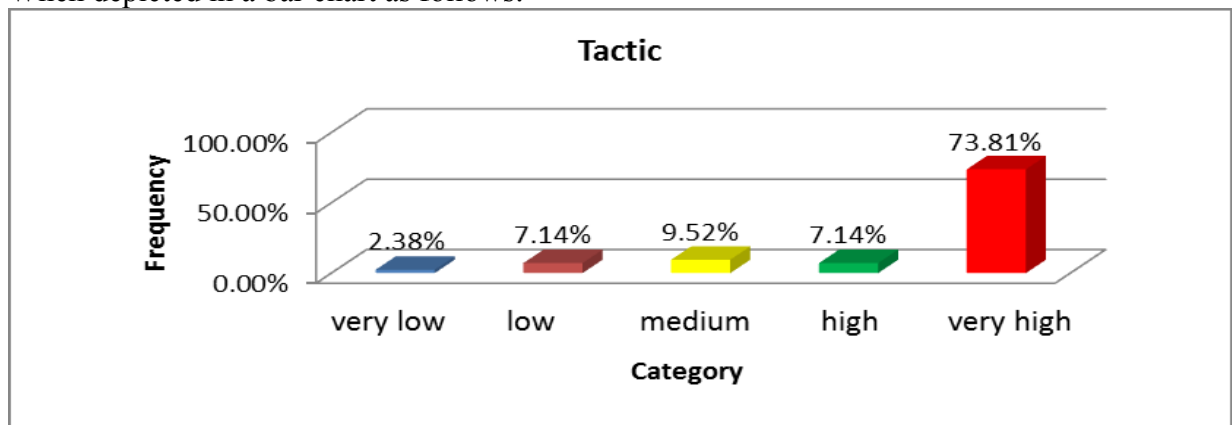
### Tactic Factors

In this research, factors tactic consisted of 7 items question. The results of the research derive maximum score = 7; minimum score = 0; mean = 5.74; standard deviation = 1.70; median = 6.00; and modus = 7.00. Based on calculation above, the frequency distribution of understanding based on factors tactic can be seen in Table 2.

**Table 2. Frequency Distribution of Understanding based on Tactic Factor**

NO	INTERVAL SCORE	CATEGORY	FREQUENCY	PERCENTAGE
1	>5.25	Very High	31	73.81%
2	4.09-5.25	High	3	7.14%
3	2.93-4.08	Medium	4	9.52%
4	1.76-2.92	Low	3	7.14%
5	≤1.75	Very Low	1	2.38%
Total			42	100.00%

Based on the table above, it is obtained understanding based on tactic factor: 1 student (2.38%) is "very low", 3 students (7.14%) are "low", 4 students (9.52%) are "medium", 3 students (7.14%) are "high", and 31 students (73.81%) are "very high". When depicted in a bar chart as follows:



**Figure 2. Bar chart of Understanding based on Tactic Factor**

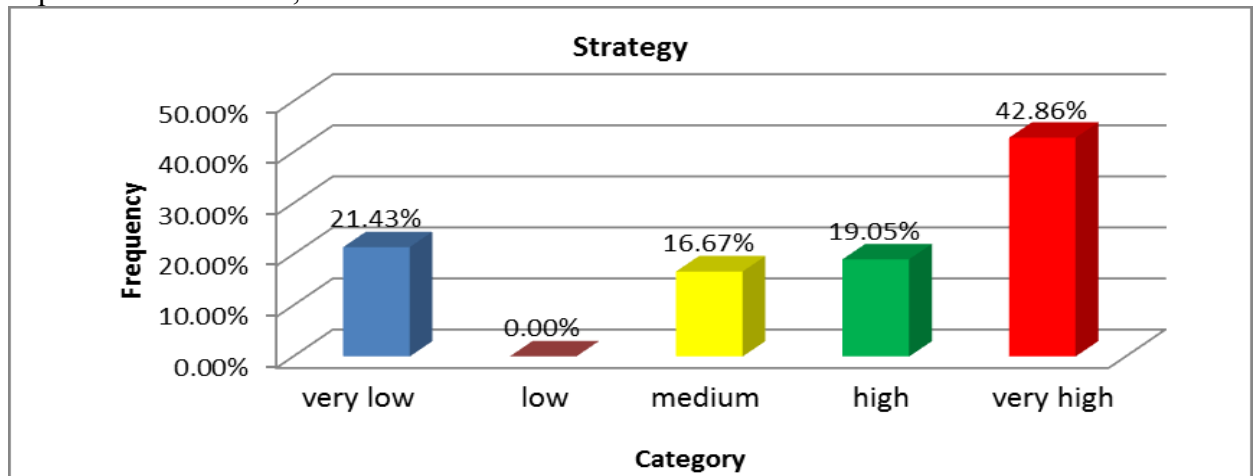
### Strategy Factor

In this research, factors strategy consists of 4 question items. The result derives maximum score = 4; minimum score = 0; mean = 2.76; standard deviation = 1.34; median = 3.00; and modus = 4.00. By calculation above, the frequency distribution based understanding of the strategy factors can be seen in Table 3.

**Table 3. Frequency Distribution of Understanding based on Strategy Factor**

NO	INTERVAL SCORE	CATEGORY	FREQUENCY	PERCENTAGE
1	>3.00	Very High	18	42.86%
2	2.34-3.00	High	8	19.05%
3	1.68-2.33	Medium	7	16.67%
4	1.01-1.67	Low	0	0.00%
5	≤1.00	Very Low	9	21.43%
Total			42	100.00%

Based on the table above, it is found factor strategy understanding which are 9 students (21.43%) are very low, 0 students (0%) is low, 7 students (16.67%) are medium, 8 students (19.05%) are high, and 18 students (42.86%) are high. When depicted in a bar chart, as follows:



**Figure 3. Bar Chart Understanding based on Strategy Factors**

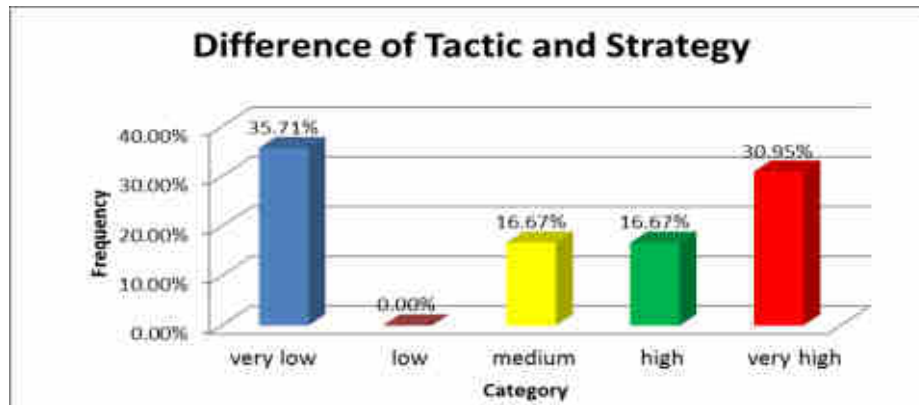
#### **Differences Tactic and Strategy Factors**

The results of the research derive maximum score = 4; minimum value = 0; mean = 2.36; standard deviation = 1.38; median = 2.00; and modus = 4.00. Based on these calculations, the frequency distribution of the difference factor understanding of tactics and strategy can be seen in Table 4

**Table 4. Frequency Distribution Understanding based on Differences of Tactics and Strategy Factors**

NO	INTERVAL SCORE	CATEGORY	FREQUENCY	PERCENTAGE
1	>3.00	Very High	13	30.95%
2	2.34-3.00	High	7	16.67%
3	1.68-2.33	Medium	7	16.67%
4	1.01-1.67	Low	0	0.00%
5	≤1	Very Low	15	35.71%
Total			42	100.00%

Based on the table above, PJKR B UNY 2011 students' understanding of basketball game based on differences factors tactics and strategy as follows: 15 students (35.71%) are very low, 0 students (0%) is low, 7 students (16.67%) are medium, 7 students (16.67%) are high, and 13 students (30.95%) are very high. When depicted in a bar chart as follows:



**Figure 4 . Bar Chart Understanding based on Difference of Tactic and Strategy Factor**

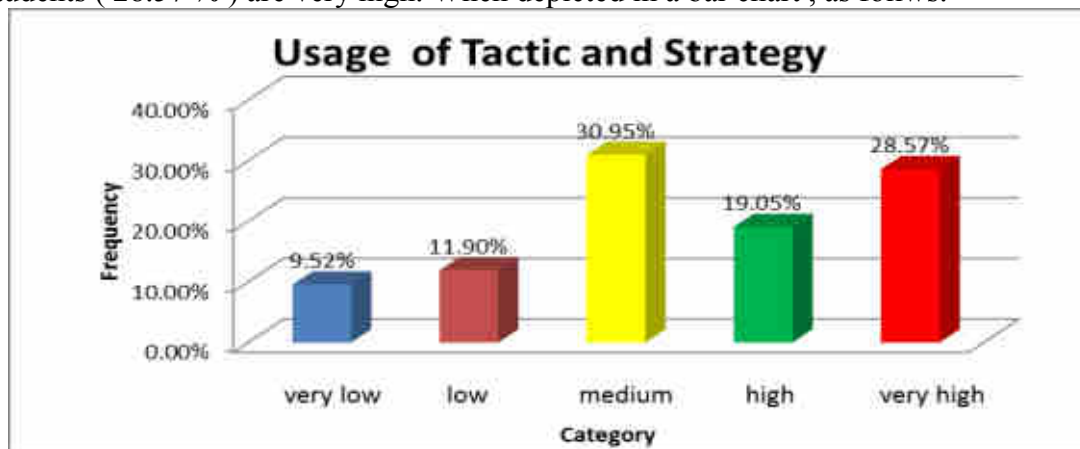
#### Usage Factor of Tactic and Strategy

The results of the research derive maximum score = 7 ; minimum score = 0 ; mean = 4.19 ; standard deviation = 1.98 ; median = 4.00 ; and modus = 4.00 . Based on calculation above, the frequency distribution of understanding by the usage of tactic and strategy factors can be seen in Table 5 bellow.

**Table 5 . Frequency Distribution of Understanding based on Usage Tactic and Strategy Factor**

NO	INTERVAL SCORE	CATEGORY	FREQUENCY	PERCENTAGE
1	>5.25	Very High	12	28.57%
2	4.09-5.25	High	8	19.05%
3	2.93-4.08	Medium	13	30.95%
4	1.76-2.92	Low	5	11.90%
5	≤1.75	Very Low	4	9.52%
Total			42	100.00%

Based on the table above, it found understanding of the tactic and strategy of PJKR 2011 FIK UNY B students in basketball game based on usage of tactic and strategy factor as follows: 4 students ( 9.52 % ) are very low ,5 students ( 11.90 % ) are low ,13 students ( 30.95 % ) are medium , 8 students ( 19.05 % ) are high , and 12 students ( 28.57 % ) are very high. When depicted in a bar chart , as follows:



**Figure 5 . Bar Chart Understanding based on Usage Tactic and Strategy Factor**



## Discussion

Based on the results of the research, it shows that the level of PJKR B 2011 FIK UNY students' understanding of the tactics and strategies in basketball game is very high. In detail, it found that 3 students ( 7.14% ) are very low, 4 students ( 7.14% ) are low, 4 students ( 9.52 % ) are medium, 14 students ( 33.33 % ) are high, and 18 students ( 42.86 % ) are very high. Having examined from each of these factors, it gained very high category on the factor of tactics and strategy. While the differences in tactics and strategy factors obtained very low category, and the usage of tactic and strategy factors obtained medium category. Based on this finding, it seems clearly that the PJKR B 2011 FIK UNY students' understanding in the game of basketball in the factor of tactic and strategy is the highest, while the lowest factor is the factor difference in tactics and strategy.

On tactics and strategy differences factors, obtained very low category, this means that plenty of PJKR B FIK UNY 2011 students are not yet or can not clearly distinguish what tactics and strategies are. This case means that the UNY 2011 FIK PJKR B students' understanding of the differences between tactics and strategies is not exactly lies on the difference of it and when to use. Thus, the duty of teacher or instructor ( lecturer ) so that students can know and understand what exactly about tactic and strategy, what the differences, why should understand the tactics and strategies and when to use.

It is influenced by some factors, in learning basketball game that applied to the students of PJKR B 2011 has been tried with a more tactical approach that has been conditioned in training students in small groups or when playing is actually confronted with the actual situation. In this case the student is faced to overcome the problems that arise in the field. Consequently expected to have critical thinking skills because they have to immediately make decisions that are not predictable. Besides, this research has been conditioned from the beginning as a blend shape approach tactics and models of sport education, so that students learn to be responsible both to the task on themselves and the team. Based on this case, it gives motivation for the students to gain a better understanding of the tactics and strategies in basketball game. In addition it is very possible because the factors of the students concerned, as fact, in class B PJKR 2011 there are some students who are talented in the game of basketball. This can be proved there are some students who have entered the selection of UKM Basketball UNY, moreover there are some students who enter the UNY main team. They also already have a license and train in some areas.

## CONCLUSION

Based on the results of the research, it can be concluded that the level of understanding of PJKR B 2011 UNY students about tactics and strategies in basketball game is "very high". In detail, there are 3 students (7.14%) have an understanding "very low", 4 students (7.14%) have understanding of "low", 4 students (9.52%) have understanding "medium", 14 students (33.33%) have understanding of "high", and 18 students (42.86%) have understanding "very high".

Based on these results, the implications of this research are as follows: to review the course syllabus of basketball game theory learned in the class and practical in the field can complement each other and sync, add lecture material with studies of both national and international matches as well as the implementation of the game of basketball off-campus.

## REFERENCES

- Anas Sudijono. (2008). *Pengantar Statistik Pendidikan*. Jakarta: PT. Raja Grafindo Persada.
- Dani Kosasih. (2008). *Fundamental Basketball – First Step to Win*. Semarang: Karangturi Media.
- Djoko Pekik Irianto. (2002). *Dasar Kepelatihan Olahraga*. Diklat. FIK UNY.
- Hal Wissel. (1996). *Bola Basket*. Jakarta: PT. Raja Grafindo Persada.
- Muhajir. (2008). *Pendidikan Jasmani Olahraga dan Kesehatan*. Bandung: Yudhistira.
- Noerhadi T.H. (1998). *Filsafat Ilmu Pengetahuan*. Diakses dari <http://zankmaxim.blogspot.com/2012/12/pengetahuan-dengan-ilmu-pengetahuan.html>. Pada tanggal 8 april 2013, jam 22.05 WIB.
- Nuril Ahmadi. (2007). *Permainan Bolabasket*. Jakarta: Depdikbud.
- Perbasi. (2010). *Peraturan Resmi Bolabasket 2010*. Diakses dari <http://mainbasket.files.wordpress.com/2011/07/peraturan-resmi-bola-basket-2010.pdf>. Pada tanggal 14 april 2013, jam 15.30 WIB.
- Soekidjo Notoatmodjo. (2010). *Metodologi Penelitian Kesehatan*. Jakarta: Rineka Cipta.
- Sugiyono. (2006). *Metode Penelitian Pendidikan*. Bandung: CVF Alfabeta.
- Suharsimi Arikunto. (2010). *Prosedur Penelitian Suatu Pendekatan Praktik*. rev.ed. Jakarta: Rineka Cipta.
- Tim Penyusun Kamus Besar Bahasa Indonesia. (2002). *Kamus Besar Bahasa Indonesia*. Jakarta: Balai Pustaka.

# **THE INFLUENCE OF EXERCISE THE BARRIER HOPS ON CROSSING AT STUDENTS YOUNG INDONESIAN SOCCER FOOTBALL CLUB IN PALEMBANG**

**Ahmad Richard Victorian**

**Bina Darma University, Indonesia**

## **Abstract**

This study discusses the influence of exercise on the strength of the barrier hops crossing school students young Indonesian soccer football club in Palembang. Problem in this study is there any influence of exercise on the strength of the barrier hops crossing school students young Indonesian soccer football club in Palembang. Purpose of this study is the researchers hope to get an increase in the use of kick instep through the exercise barrier hops. Determination of the total sample using sampling techniques, sample study of 30 people who were divided into two groups by ordinal pairing that 15 people were in the experimental group given exercise treatment barrier hops and 15 people are not given the treatment. Data analysis techniques are used normality test. Homogeneity test, using a t test. t test results showed that the test t table = 1.70 while the t test = 0.29, df = 28 and = 5 %, so, thus there are significant " barrier hops on strength training crossing school students young Indonesian soccer football club in Palembang "

**Keywords:** barrier hops, crossing

## **INTRODUCTION**

Sports are good for the community is that can be used to maintain or improve physical fitness, and can be done by many people both young and old as well as carried out by the wider community. Branch is the author olahraga taken football sports. because the author himself is a football coach Air National D license and also coaches young Indonesian football club football academy. football for his special moment southern Sumatra Indonesian society has been in the spotlight since won the Cup INDONESIA three times in a row.

In the game of football to be able to produce a long-range shot bounced more appropriate to use the instep, as it will result in a parabolic kick the ball so that the distance that will be traveled further and further away. In order for a hard kick into the stomach and leg muscles will require maximum power, therefore we need to train the leg muscle power. In the power train leg muscles, researchers use one training method is the method Poliometri. The material Poliometri exercises to improve explosive power exercises leg muscles are Barrier Hops ( Skip obstacles ). Kick the ball bounced in order to produce a much kick the leg muscle explosive movements are needed to obtain the right style.

Based on the description above, the writer wants to hold a kick away stomach exercises on Football players are entitled: " Effect of exercise on the ability of the barrier hops kicked in the stomach remote Indonesian Football School students Muda FC

In this study the research issues that will be studied can be formulated as follows  
1) What is the effect of exercise on the Barrier Hops kick in the stomach remote school students INDONESIA YOUTH FC Football?

This study aims to obtain an increase in the use of kick instep through the exercise barrier hops

Donald A. Chu (in Cayoto 2007:41) Exercise Barrier Hops is: "exercise done on a wicket wicket or obstacles that high (between 30 - 90cm) laid sector in line with the distance determined by ability. Barriers will fall when the athlete makes a mistake, starts with standing behind obstacles, bouncing movements that pass the obstacles with both feet bersaman. The movement started from stretchable waist and knees, then use a second swing arm to maintain balance and achieve the heights.

Researchers themselves using obstacles - obstacles or her 50cm high box because in accordance with the height right kids school football and obstacles lined up according to the ability of athletes at the time of the initial test .

Barrier hops is one form of exercise plyometrik , which exercises explosive power in this muscle in his explosive power training is the muscles of the lower body , due to kick the ball and produce maximum results in the need to train the lower body , Maskur in his book entitled kinesiology ( 2006:38 ) one of the most important muscle groups for movement jump , run and kick is the calf muscle ( musculus triceps surae ) . Muscle - This muscle is composed of three parts , namely the twin calf muscle ( musculus gastrocnemius ) with two Origo , respectively - each on the medial and lateral femoral condyli and a flat muscle ( musculus soleus ) which berorigo on the dorsal tibia and the plantar musculus Origo her on condylus lateralis femoris . Her third has one achilles tendon with tendon is attached to the os calcaneus.

## METHODS

In his book titled research procedures a practice approach, suharsmi, Arikunto (2006:3), defines an experiment as a research situation that at least one free variable, which is called experimental, deliberately manipulation by researchers. To determine whether there is manipulation of the independent variables influence the dependent variable in an experimental study, the observations need to be done.

This study is experimental research, which is to determine the effect of exercise hops barrier against stomach kick distance. Physiologically, exercise can be seen from the results and influence within 6-8 weeks with a frequency of at least 3 times a week (Harsono, 1998)

According Suharsimi Arikunto ( 2006:108 ) " the overall study population is the subject of research " . Overall that were targeted in this study were students SSB INDONESIAN YOUTH FC with a population of 30 students .

The technique used is total sampling technique with ordinal pairing system to determine the experimental group and the control group .

instrument is a data collection tool that is in use in a study . In the implementation of this study , the test instrument used in the test kicking the ball itself. Tests kicking a ball aimed to measure how much distance results instrumaent kick the ball using a tape measure or measuring instrument in meters .

Facilities and infrastructure that are used in this test , namely : 1 ) Ball 2 ) soccer shoes 3 ) Field 4 ) soccer Costume 5 ) Meter 6 ) Whistle 7 ) Stationery 8 ) The recording of test results

Implementation of the test :

Students are made in the sample stand in the field marked ( lines ) with the ball is behind the line , students kick as far as possible, then proceeds to kick the ball on the mark with chalk students when the ball dropped . Samples were given a chance to kick

3 times , then measured with a tape measure and take the farthest distance . Scores : Grab the farthest distance from the test results of the three kicks as kicking a ball

This study was carried on the football field STEP 3 Soak place was chosen because it is an exercise in SSB INDONESIAN YOUTH FC

This study was done for 6 weeks from 13th September until 22 October . This exercise lasted for 3 times a week , the day , week , Wednesday , Friday . Her practice time afternoons from 15:30 to 17:30 o'clock .

The variables in the formula can study it as an attribute value or the nature of people or events that have a certain variation in the set by the researchers to be learned and then pull in the conclusion ( Sugiyono , 2006: 42 ). In this variable there are two variables :

a. The independent variable ( X )

As the independent variable of this study is the deepest iabel exercise barrier hops

b . The dependent variable ( Y )

The dependent variable in this study is the ability to kick the ball away , the test results achieved from kicking the ball .

Before giving the existing restrictions on the research variable , then it must needs be that there is no limit in accordance with the intended interpretation . The operational definition of variables in this study are as follows :

1 ) The effect is that there is power or arising out of one person , who also helped with the character object , one's beliefs or actions . 2 ) Exercise is an activity that is carried out systematically , repeatedly and given the amount of load that is increasingly rising to the regular programs to achieve specific goals , ( Kosasih 1985:46 )

Prior to the study of things that must be done to prepare a study is as follows : 1 ) Prepare and administer a permit to do research 2 ) Setting up the instrument 3 ) Prepare the auxiliary personnel in the conduct of research data retrieval 4 ) Carry out tests on the variables to be studied through measurement : Kick the ball away stomach

Data analysis method is a way in which to obtain or analyze the data obtained . The analysis aims to truth hypotheses that have been formulated . One hypothesis would be accepted or rejected depending on the result of data showing the influence or not the results of the exercise . For that needs to be verifiable. Statistical data analysis techniques that researchers use is the test " t "

Statistical formula t test ( t - test) :

$$t = \frac{Mx - My}{\sqrt{\left(\frac{\sum x^2 + \sum y^2}{Nx + Ny - 2}\right)\left(\frac{1}{Nx} + \frac{1}{Ny}\right)}} \quad (\text{Arikunto, 2006:311}) \quad (1)$$

$$\sum x^2 \text{ dapat diperoleh daari } \sum X^2 - \frac{(\sum X)^2}{N} \quad (2) (\text{Arikunto, 2006:312})$$

$$\sum y^2 \text{ dapat diperoleh dari } \sum Y^2 - \frac{(\sum Y)^2}{N} \quad (3)$$

## RESULTS AND DISCUSSION

In this chapter the author will elaborate on the presentation of data , data analysis , and discussion of research results . The purpose of these three is to test the truth of the hypotheses that have been proposed . Thus the truth that there can be justified scientifically . A more detailed explanation is as follows . Presentation of data. After

preparatory studies completed, his next activity is the implementation of the research. Implementation research is a form of data collection activities are in need. Implementation of this research is done on the football pitch sukabangun II Palembang. This study was done with the stage: Test data retrieval gastric kick the ball long distances. The steps for the preparation of the implementation of the test, namely:

- a. Contacting students to be sampled and provide an appropriate explanation in its relation with the retrieval of data.
- b. b. Contact the coach and the other executors of his aides that his fellow students program of study PE to participate in the data collection of this study.
- c. c. Record data that was obtained from each sample that has been doing the tests.
- d. Of these variables are kicking the ball hull test results remotely collected and compiled, then if the statistical calculations. To facilitate the way of process data, then the data obtained were inserted into the table listed below.

**Table 1. List Of Pre Test Distance Kick Soar**

Exsperimen Group			Control Group	
Nama	Pretest	No	Nama	Pretest
AND	44,0	1	JNP	43,9
MSP	41,3	2	RAF	42,0
ANG	40,0	3	MSK	40,3
SMP	39,9	4	SMT	39,8
AAT	39,7	5	HAN	39,7
BAP	39,4	6	MAL	39,7
DWS	39,2	7	DIH	39,6
FR	37,8	8	DM	39,4
FP	37,5	9	MLF	39,3
MB	37,3	10	GGP	39,0
MRE	37,1	11	ADK	37,7
MSP	37,1	12	DWK	37,5
REV	37,0	13	GNT	37,2
DYS	35,7	14	RMP	35,1
RSA	35,0	15	HMA	35,0
	578	$\Sigma$		585,2

t obtained is 6.87. With  $df = 30 - 2 = 28$  and the 95% confidence level ( $\alpha = 0.05$ ), it can calculate the value of t table for  $df = 28$ , which is contained in the table is 1.70. Because  $t(6,87) > t \text{ table}(1,70)$  then there is a significant difference between the experimental group and the control group. Thus, the hypothesis  $H_0$  is rejected and  $H_1$  is accepted. The  $H_1$  statement that "There is an effect of exercise on the strength of the barrier hops kick in the stomach remote Indonesian school football youth football academy in Palembang."

## CONCLUSION AND RECOMMENDATIONS

Based on the research and analysis of the data it can be concluded as follows 1) The ability of the stomach kick remotely on a young Indonesian soccer school student football academy is good enough, it can be seen from the analysis of the data where the average ability before being given treatment that is the ability of the stomach kick distance nya38, 56. 2) After getting exercise during the 6-week exercise turned out to be no effect of gastric barrier hops to kick remotely on a football school students

younger Palembang Indonesia . Where the average ability in the stomach kick distance of 38.56 before training increased by 0.8 so that the average ability of the stomach kick distance becomes 39.36 . 3 ) Exercise barrier hops basically aims to train explosive power of lower limb muscles .

Exercise barrier hops affect the increased strength of the hull distance shot at students young Indonesian soccer school in Palembang , so researchers will provide suggestions as follows: 1 ) Use it as a form of exercise barrier hops latiahn for athletes or students that aims to improve the ability of the stomach kick distance . 2 ) To be able to practice in accordance with the purpose of the exercise training should be done in accordance with the principles of the existing training and exercise program appropriate denagn akank run . 3 ) The form of exercise can be done by modifying accordance with existing infrastructure.

## REFERENCE

- Arikunto, Suharsimi. 2006. *Prosedur Penelitian Suatu Pendekatan Praktik*. Jakarta: PT. Rineka Cipta.
- Harsono. 1988. *Coaching dan Aspek Psikologi dalam Choaching*. Jakarta: Departemen Pendidikan dan Kebudayaan, Direktorat Jenderal Pendidikan Tinggi, Proyek Pengembangan Lembaga Pendidikan Tenaga Kependidikan.

# VALIDITY AND RELIABILITY OF FUTSAL SKILL TEST

Agus Susworo Dwi Marhaendro

Yogyakarta State University, Indonesia

## Abstract

The aim of this study was to assess the criterion validity and the test-retest reliability of the Futsal Skill Test (FST). Twelve male futsal players and 12 female players from university futsal teams volunteered to participate in this study. The FST requires players to pass, control, dribble, and shoot the ball as quickly as possible whilst making the fewest mistakes. Participants completed two main trials on the same day. All trials were performed inside a futsal court, using futsal balls, and following a standardised warm-up. Validity of the time taken (.7506 and .6503) and the total performance time (.7786 and .6830) for male and female. Reliability of the time taken (.7895, .7532, and .8866) and the total performance time (.7792, .7404, and .8734) for male, female, and all players. The validity for the time taken and the total performance time were acceptable for male players and questionable for female players. The reliability for the time taken and the total performance time were moderate. The validity and reliability of the FST were lower for female players. In conclusion, the FST are valid and reliable protocols to assess differences in futsal skill performance.

**Keywords:** skill test, futsal

## INTRODUCTION

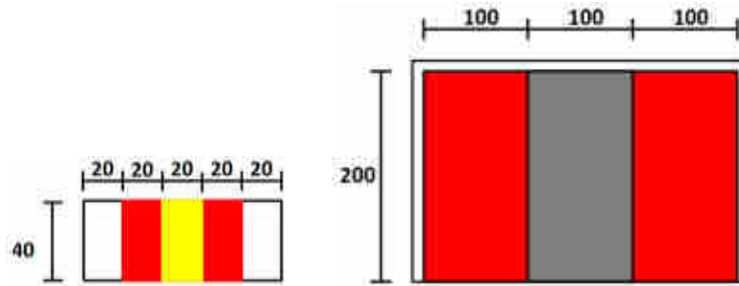
Futsal is a FIFA regulated five-versus-five indoor football game played on a hard surface court. Futsal is a recent ball team sport with a significant increase in popularity over last years. In this decade, futsal became one of the most attractive team's sports. Futsal has incredibly fast passing, and is the epitome of a team sport that still allows room for individual demonstrations of skill, tricks and feints that are relished by players and spectators like [1]. Futsal is deference than soccer. Every futsal players had more changes to contact with the ball (receiving, passing, dribbling and shooting) because the players was too a little and the pitch was too narrow than soccer. The public was more playing futsal.

Futsal is a team sport. The team sport differs from individual sports in that there is no definitive index of each player's performance. The coach may consider that the individual played well if he/she has contributed to executing the overall game plan [2]. The fundamental principle of futsal is to score more goals than the opposing team. Futsal players cooperate with team member in pursuit of common aims, the principal ones being to score goals for the team when in possession of the ball, and to prevent goals being scored against the team when the opposing players have the ball [3]. Team sports refer to games played between two opposing teams. The players interact directly and concurrently to achieve an objective that involves team members facilitating the movement of the ball or a similar item in accordance with a set of rule. Futsal is a team sport, so it takes the performance of each player to be able to support the team's performance. Performance players have a minimum standard that must be mastered. Every player must have the futsal skills as an indicator the futsal team player. It would appear that skilful performances are crucial to winning futsal matches.

Skill was more than technique. The skill aspect is the where the player has a learnt ability to select and perform the correct technique as determined by demands of the situation [4]. A futsal player might have good patterns of movement but if he/she does not perform the right action at the right time then he/she becomes an almost useless player. Futsal players must be able to demonstrate techniques of controlling, passing, dribbling, and shooting as the circuit is limited by space and time. A farther aid to the coach attempts to get to know the need of the







**Figure 2. Passing target and shooting target.**

#### **Instructions for the futsal skill test**

Participant started with the futsal ball by the centre passing area (yellow rectangle). The first perform; the participant was doing sequence of passes six times to the coloured target, and the first examiner started timing the test, using a hand-held stopwatch, from the moment the ball was passed at the first time. The second perform; the participant was strike dribbling to the pivot area, than dribbled back to the centre passing area again. The third perform; the participant was required sequence passes six times to the two coloured target by turns. The fourth perform; the participant was required dribbling zig zag to the other pivot area. The fifth perform; the participant are required sequence passes six times to the coloured target at the two passing area (green rectangle) by turns. The final perform; the participant was required shooting into the net (goal) three times, two times with dominant leg and one with the other leg, at the two shooting areas (blue rectangle). If three balls had shot into the net two times with dominant leg and one time with the other leg, the shooting has been completed. But if it has not been able to shoot the three balls was given a chance up to seven balls. If seven balls has not been able into the net, the shooting has also been completed.

The first examiner started timing the test, using a hand-held stopwatch, from the participant was kicked the ball and stopped timing test to the shooting has been completed. The second examiner was to record penalty time points accrued during trials. Penalty time was awarded for the following errors:

- 3 s for handling the ball
- 2 s for missing the goal from shooting
- 1 s for hitting the bar goal from shooting
- .5 s for hitting the middle target goal
- 1 s for shooting the ball from outside of the designated area
- 1 s for the ball touching any cone
- 1 s for the shoes touching any cone
- 1 s for the pivot dribbling outside of the designated area
- 0.5 s for hitting the red target area passing
- 1 s for hitting the white target area from passing
- 1 s for passing the ball from outside of the designated area
- 1 s for receiving the ball from outside of the designated area

Furthermore, the players were informed that for best performance on the FST they would have to perform the test as quickly as possible whilst making the fewest mistakes. Score test such as time taken and penalty time in performing a series of tasks. Penalty manifested in a sentence with the addition of time, according to the mistakes made. So the total test score is derived from the sum of the time that execution time and penalty time. The score test was the best score of the two trials.

#### **Experiment procedures**

The participants completed two mail trials, at the one day. Participants are given the opportunity to try out the protocol of futsal skills test before recording the data. While between

the two trials, participants did not have a chance to practice. A 15-minutes standardized warm-up, consisting of jogging, striding, sprinting, and stretching exercises, preceded the trials.

### Statistical analysis

Test-retest is a method of estimating reliability [7]. Pearson's correlation was used to assess reliability between sets of score. The criterion-related approach to test validation involves examining the empirical relationship between score on test and a criterion of interest, typically by use of correlation coefficient [12]. Concurrent validity design studies collect test and criterion score at about the same time. The criterion is player rank at the team as coach's judgment. Every team, male and female, had three coaches. Spearman's rank correlation was used to assess validity between score test and player rank as criterion score. The validity was average Spearman's rank correlations. Median-split analysis was used to assess criterion validity. Cross-validation was performed by calculation of the phi coefficient [10]. Calculating the correlation coefficient used Microsoft Excel 2010 and IBM SPSS Statistics 19. The strength of correlations was based on values derived from Vincent [9], i.e., 0.5 (low), 0.7 (moderate), and 0.9 (strong).

## RESEARCH RESULTS AND DISCUSSION

### Results

A summary of the FST performance score for male and female players, as well as both groups combined, is presented in Table 1. The actual performance score comprises two variables: the time taken to complete the FST and any accrued penalty time for poor control or inaccurate passing, dribbling and shooting. Trial 2 scores were significantly improved in all but one of the variable, thus highlighting a trial order effect.

The result of the median-split table analysis showed that for all components of FST, the majority of the subjects were in the "expected" group (table 2). So for example, for total performance time, 11 out of 12 male players were better than the median score and 11 out of 12 female players were worse than the median score.

There were moderate correlation between trials for the time taken to complete the FST ( $r = 0.7532 - 0.8866$  table 1). The correlation for penalty time was low for male and all groups ( $r = 0.0400 - 0.2740$ ) but was moderate for female group ( $r = 0.6923$ ). The correlation for the overall performance for the whole group was moderate but statistically significant ( $r = 0.8734$ ).

**Table 1 Mean ( $\pm$  SD) FST performance times, correlation (r) between trials and significant (sig.)**

Variable	Trial 1 (s)	Trial 2 (s)	R	sig.
Male (n = 12)				
Time taken	57.89 ( $\pm 10.43$ )	56.59 ( $\pm 11.08$ )	0.7895 *	0.002
Penalty time	12.25 ( $\pm 5.33$ )	11.46 ( $\pm 3.99$ )	0.0400	0.902
Performance time	70.14 ( $\pm 14.81$ )	68.05 ( $\pm 11.27$ )	0.7942 *	0.002
Female (n = 12)				
Time taken	83.63 ( $\pm 13.59$ )	78.34 ( $\pm 11.81$ )	0.7532 *	0.005
Penalty time	13.42 ( $\pm 5.16$ )	15.29 ( $\pm 2.14$ )	0.6923 **	0.013
Performance time	97.05 ( $\pm 17.34$ )	93.64 ( $\pm 11.78$ )	0.7404 *	0.006
All (n = 24)				
Time taken	70.76 ( $\pm 17.70$ )	67.47 ( $\pm 15.77$ )	0.8866 *	0.000
Penalty time	12.83 ( $\pm 5.17$ )	13.38 ( $\pm 3.69$ )	0.2740	0.195
Performance time	83.59 ( $\pm 20.92$ )	80.84 ( $\pm 17.26$ )	0.8734 *	0.000

\* indicates significant correlation between trials  $p < 0.05$ ; \*\* indicated significant correlation between trials  $p < 0.01$ ;

**Table 2 Median-split table for FST performance between male and female players**

		Above median	Below median
Time taken	Male	11	1
	Female	1	11
Penalty time	Male	11	1
	Female	1	11
Performance time	Male	11	1
	Female	1	11

**Table 3 Validity FST for all players**

		Time taken	Penalty time	Performance time
Trial 1	Male	0.7552 **	0.7972 **	0.8765**
	Female	0.7110 **	0.3112	0.6807*
Trial 2	Male	0.5758*	-0.0385	0.6154*
	Female	0.5734*	0.1037	0.5711*
Best score	Male	0.7506**	0.4044	0.7786**
	Female	0.6503*	0.2762	0.6830*

There correlation between rank coach judges and score for the time taken to complete the FST were moderate to trial 1 for male and female, and to the best score for male, were low to trial 2 for male and female, and to the best score for female. The correlation for penalty time was moderate to trial 1 for male but were poor to the other. The correlation for the overall performance time were moderate to trial 1 and the best score for male, were low to the other. The agreement between coaches were moderate for all coupled male team coaches, and were strong for female team coach 1 and coach 2, but were moderate for the other. The objectivity of the FST was average the agreement between coaches, for male 0.8461 and female 0.8881 were moderate correlation.

**Table 4 Objectivity between coaches**

		Coach 1	Coach 2	Coach 3
Coach 1	Male	1	0.8741	0.7762
	Female	1	0,9441	0,8951
Coach 2	Male	0.8741	1	0.8881
	Female	0,9441	1	0,8252
Coach 3	Male	0.7762	0.8881	1
	Female	0,8951	0,8252	1

## DISCUSSION

The aim of this study was to valid and reliable the Futsal Skill Test as tool to assess futsal skill for use with male and female players. Male players exhibited better performance score than female players, thus confirming the criterion validity of the test. There was a good degree of reliability for the group as a whole but male players showed more consistent performance, between trials. To be a “good” test, a test ought to have adequate evidence for its validity, reliability, and accuracy for the purpose it is being used for, and for the persons it is being used with [7]. The FST have validity by criterion-related validity and reliability by rest-retest reliability could use to assess futsal skill for male or female players. The variable can be measure by FST were time taken and performance (total) time, so the FST have two form protocol test; just time taken and total performance time. The FST (time taken) had validity

(0.7506 and 0.6503), and reliability (0.7895 and 0.7532) use for male and female. The FST (performance time) had validity (0.7786 and 0.6830) and reliability (0.7942 And 0.7404) use for male and female.

The median-split table was used to examine expected and observed outcomes. For this analysis, all subjects' scores were ranked—in theory, all of the male players would perform better than the median whereas all female players' scores would be below this criterion score. Table 2 shows that 11 out of 12 female players were in the “expected” group whereas 11 out of 12 male players were in the “expected” group. As male players were perceived to have a superior futsal-playing ability and, as this was confirmed by their performance on the FST, this highlights the construct validity of the test. Another approach to validity of criteria-referenced test is decision accuracy that involves decisions of cut-off score [10]. Phi coefficient was calculating from the media-split table ( $r = 0.9495$ ). Thus it would appear the FST also has a high degree of criterion validity. The FST could use for both of them with validity (0.9495 and 0.9495) and reliability (0.8866 and 0.8734) by time taken and performance time form.

A test can be valid only if it is reliable, so reliability sets an upper limit for validity [14]. Reliability is more easily obtained than validity, so that the test should have a greater reliability than validity. The FST used to male for time taken and total performance had reliability upper than validity (0.7895 and 0.7942 > 0.7506 and 0.7786). Similarly, for female (0.7532 and 0.7404 > 0.6503 and 0.6830). However, different for male and female, was higher validity than reliability on time taken only and total performance time (0.9495 and 0.9495 > 0.8866 and 0.8734). To present a good supporting evidence for reliability (and thus, validity), a correlation of 0.70 or higher is desirable [11] (Lacy, 2011; 89). Although, the validity of the scale is greater than the reliability, but the evidence of the validity and reliability can be accepted. While the validity of the tests used for female still need to do further study, because it is less than 0.7. This can affect the amount of validity to use for both male and female.

The value of reliability has its own interpretation. The interpreting reliability was based on values of correlation coefficients derived from Barrow and McGee [7], 0.60 (questionable), 0.70 (poor), 0.80 (acceptable), 0.90 (very good), and 0.95 (excellent). Reliability of the FST used to male were poor for time taken only and total performance time and to female too. That deference for reliability the FST used to both male and female was acceptable. Only one method of determining reliability was used in this study for comparison with previous (and future) test and to increase the stringency with which the reliability can be assessed. This reliability can be used by internal consistency or agreement methods.

The value of validity has its own interpretation. The interpreting validity was based on value of correlation coefficients derived from Barrow and McGee [7], 0.60 (questionable), 0.70 (acceptable), 0.80 very good and 0.85 (excellent). Validity of the FST used to male were acceptable for time taken only and total performance time but to female were questionable. That deference for validity the FST used to both male and female was excellent. Only one method of determining validity was used in this study for comparison with previous (and future) test and to increase the stringency with which the validity can be assessed. This validity can be used by content validity by expert.

Validity and reliability evidence must be obtained for any new test before the test is used [6]. Test FST can used to assess futsal skill players that had validity and reliability evidence for male and female players. The participant are the students at university, so this test can used to them or the same level players. The validity and reliability of the test cannot be automatically generalized to other populations [11]. Evidence of validity and reliability for male players and female together is higher than for male players or women on their own, so it is still worth doing the assessment and verification of validity and reliability in other subjects, such as students or junior level. Thus it can be seen that the cutoff score of the skills of junior and senior futsal players.

Reliability is the extent to which an instrument consistently measures whatever it measures. There was a trial order effect where players improved performance from trial 1 to trial 2; however, we feel that a few more attempts to habituate participants with the test would

reduce this learning effect in the future. The steps in learning skill were; understanding, practice and performance [13]. At performance's stage, the skill is executed in a match or activity. When executing the skill, players should focus on the purpose of the activity and not the process. When a skill is being performed conscious thought is replaced by automaticity. More mastery players is more automaticity, making it quicker to adapt to the situation.. Trial 2 is more performed than trial 1 on all aspect for male and female, expert on penalty time for female. There is evidence that male players more performed than female players. More power (quickly) is less accuracy [5]. Female players is less performed than male players, so when she added power (quickness), she less accuracy or more error. The results of this study suggest that the more skilful players were able to do this, thus highlighting the validity of the FST.

Scoring is the best time of the two trials to test. The validity of the test scores are lower than the scores obtained from the trial 1, for all aspects (time taken only, penalty time and performance time)). This does not have to consider how to make use of Anomalies scores, but more on that aspect of punishment that do not have time high validity. Thus the aspect of error in performing skills cannot be a major consideration. The players had good skill made errors caused by psychological factors rather than physical and techniques factors.

Regardless of the type of analysis, the result of this study show that the gross motor aspects of test would appear to be more repeatable. The score for male players were upper than those for female players for speed and accuracy aspects but was lower for error aspect. That's indicating that the test were more reliable in both players. Knapp suggested that skill is also synonymous with the minimum outlay of time and energy [15]. Consequently, the more skilful players, they are quicker able to perform the skill test without compromising their ability to make accurate passes, receiving, dribbling and shoot the ball. It is for these reasons that the FST included a dynamic element so that players had to decide upon how best to receive the ball, how to position themselves for the pass and shoot in relation to the targets, and so on.

Finally, the FST have been shown to be valid and reliable methods of assessing futsal skill performance for research use. They appear to be more repeatable for better players who show less variability in their skill performance.

## **CONCLUSION AND SUGGESTION**

The FST was developed to measure futsal skill for male and female players. This test can be used for research purposes and the selection of players. If there is a tiered competition in futsal coaching achievement, then this test can be used as a tool to determine the skill level of players at the level futsal competition everywhere. So the competition can be run more competitive, because every player has a skill impartial.

## **REFERENCES**

- V. Hermans and R. Engler, *Futsal: technique tactics training*, Maidenhead: Meyer & Meyer Sport (UK) Ltd. 2011, p 11.
- T. Reilly, *The Science of Training – Soccer*, Madison Ave, NY: Routledge, 2007, p 19.
- B. Travassos, D. Araujo, L. Vilar, and T. McGarry, "Interpersonal coordination and ball dynamics in futsal (indoor football)," in *Human Movement Science*, vol. 30, pp. 1245-1259, April 2011.
- A. Ali, C. Williams, M. Hulse, A. Strudwick, J. Reddin, L. Howarth, J. Eldred, M. Hirst, and S. McGregor. Reliability and validity of two tests of soccer skill, in *Journal of Sport Sciences*, vol. 25 , pp. 1461 – 1470, November 2007.
- E. Worthington, "The coach" in *Coach's manual Australian Soccer Federation*, Melbourne: The Broken Hill Proprietary Company Ltd., 1984, p 17.

- T.A. Baumgartner, Measurement and Evaluation Council in Measurement Issues in Aging and Physical Activity (Zhu, Weimo and Chodzko-Zajko, Wojtek) Champaign, IL: Human Kinetics, Inc., 2006, p
- T. Kubiszyn, T and G. Borich, Educational Testing and Measurement: Classroom Application and Practice (9<sup>th</sup> edition), Hoboken, NJ: John Wiley & Sons, Inc., 2010, p.329.
- B.N. Strand, and R. Wilson, Assessing Sport Skill, Champaign, IL: Human Kinetics Publishers, 1993, p 11.
- J.W. Vincent, Statistics in kinesiology, Champaign, IL: Human Kinetics Publisher, 2005, pp. 93 – 124
- J.R. Thomas and J.K. Nelson, Research methods in physical activity, Champaign, IL: Human Kinetics Books, 1990, p 348.
- A.C. Lacy, Measurement and evaluation in physical education and exercise science, San Francisco, CA: Pearson Education, Inc., 2011, p. 89.
- K.S. Shultz and D.J. Whitney, Measurement theory in action: case studies and exercises, Thousand Oaks, California: Sage Publication, Inc., 2005, p 101.
- P.G. Schempp, Teaching sport and physical activity, Champaign, IL: Human Kinetics, 2003, p 40.
- M.L. Van Blerkom, Measurement and statistics for teachers, Madison Ave, NY: Routledge, 2009, p. 46.
- B. Knapp, Skill in sport: The attainment of proficiency, London: Routledge, 1963.

# **PHYSICAL EXERCISE FOR TENNIS ATHLETE WITH WEIGHT TRAINING**

**Ahmad Nasrulloh**

**Yogyakarta State University, Indonesia**

## **Abstract**

Tennis is one of game sports that is popular in today's society. Tennis sport achievement in Indonesia still needs to be improved because it has not shown an outstanding achievement in the international arena. The athlete performance while competing is strongly influenced by physical ability, technique, tactics and mentally. Physical ability will be obtained only by practice. Exercise that should be carried out must be in accordance with the principles of exercise. One example is the principle of overload, where each athlete during training should be given more exercise load that training can be meaningful. Excess weight will be more effective if done using external load with the help of weight training equipment. Therefore we need a method of physical exercise using the loading system in the form of weight training to help improving athlete performance when competing. Weight training is importantly needed by a tennis athlete to help improving his or her physical abilities to perform the best when competing. Tennis athletes require weight training to train the muscles that have contributed significantly to the performance. The muscles that contribute while playing tennis are leg muscles, chest muscles, and arm muscles. One of the training methods to train these muscles is with weight training method. The weight training program was conducted by the method of circuit weight training with a fast rhythm, the intensity is 40-80% RM and the frequency of exercise is 3 times / week. This exercise uses 6-12 posts with recovery post between 0-30 seconds. This exercise should be done 2-5 sets with 10-25 reps and <60 seconds recovery among sets.

**Keywords:** physical exercise, tennis athlete, and weight training

## **INTRODUCTION**

Tennis is one game sport that is popular in today's society. Most people have started to recognize this and made the sport as a hobby. The number of children who joined in a tennis coaching club shows that tennis is favored by children. From among adolescents and adults who are often do tennis are done as a competition to get the achievement. It is also often used as a means of interacting with the environment. Some people who are elderly use tennis as one alternative to be able to maintain physical fitness and as a means of recreation, so their health quality is always maintained.

The tennis sports achievements in Indonesia still needs to be improved because it has not shown outstanding achievement in international level. Indonesian athlete performance when playing is still not maximum in results. This can be seen when athletes who compete tennis championship at the international level is still not able to achieve remarkable achievements. The athlete performance while competing is strongly influenced by the physical ability, technique, tactics, and mental. The physical ability can affect athlete performance because if the physical quality of an athlete is lower than the opposite, he or she will lose the game, as well as technical ability, tactical and mental rigidity. If the abilities can be controlled by Indonesian athletes, they will be able to offset other athletes from other countries and even can defeat them. Therefore, Indonesian tennis athletes still need proper, regular, scalable and programmed exercise coaching according to the right exercise dosage in order to improve performance during when competing so that they can get achievement in international competition.

The process of athlete development should be adjusted to the principles of exercise. According Sukadiyanto (2002: 14), the exercise principles include: (1) individual, (2) adaptation, (3) overload, (4) progressive load, (5) specificity, (6 ) varies, (7) warm-up and



cooling down, (8) periodicity, (9) reversible, (10) a moderate load (not excessive), and (11) should be a systematic exercise. The basic principles of the exercise should always be adhered to and implemented in order to achieve target practice. Athletes and coaches often forget the basic principles of the practice. One example is the principle of overload, where each athlete during training should be given the excess load that can exercise meaningful. Imposition of the excess would be more effective if done using external load with the help of weight training equipment.

Weight training is a physical activity that can be done by each human individual being. There are many objectives to be gained in doing weight training, such as to build muscles, make their body more ideal, athletic body shape, improve fitness, train strength and power training. Today, there are many people use weight training facilities as a means to train physique. However, some tennis athletes have not realized the importance of strength training for physical training. There is some notion that tennis athletes do not need to do weight training because it will damage the technique that has been mastered. This assumption is actually incorrect, because weight training, if done properly and correctly in accordance with the proper dose of exercise, will make a positive contribution to the physical condition of an athlete.

In tennis game sport, specifically, it is that weight training can be used as an exercise to train power. Once weight training given to athletes excessive and done quickly, then the power will be trained, so it can increase the athlete performance. Weight training is one alternative that is appropriate for a variety of exercises to build physical abilities in order to balance the composition of technique and physique. In fact, the training process of developing athletes that has been performed so far does not much pay attention on the balance between training technique training and physical training. Therefore, it needs a method of physical training by using a loading system to help improving athlete performance on competition.

## DISCUSSION

According Arma (1981: 502) tennis is one sport form using a small ball and every player wears a racket as the beater. The basic principle of playing tennis is hitting the ball before or after bouncing on the floor across over the net and into the opponent's game area (Sukadiyanto, 2002: 29). Tennis game sport is a sport that is performed on a rectangular field by using a small ball using a racquet to hit up over the net and into the opponent's court area.

According Sukadiyanto (2002: 29-30), to complicate the opponent when hitting the ball, there are some basic techniques, namely: (a) groundstrokes consisting of forehand and backhand, (b) volley also consists of forehand and backhand, (c) service, (d) lob and smash. Meanwhile, according to Strand (1993: 88) tennis skills typically taught in a physical education unit include serves, ground strokes, lobs, drop shots, and overhead smashes. From above, it can be concluded that the opinion that every athlete must master the technique of tennis basic skills, namely: (a) forehand and backhand groundstrokes, (b) freshly prepared, (c) volley forehand and backhand, (d) lob, (e) smash overhaed, and (f) drop shots.

In addition to technical ability, in playing tennis, there should be supported by physical ability. The physical ability can be obtained only by physical training in appropriate training portion. There are some expert opinions about training: "training is usually defined as the systematic process of repetitive, progressive exercises, having the ultimate goal of improving athletic performance" (Bompa, 1999: 1). According Nossek (1982: 10), training is a process or, in other words expressed, a period of time lasting several years, until the sportsman Achieves a high standard of performance. Principally, the exercise is to provide regular, systematic, continuous physical pressure in such a way, so as to improve the ability to perform physical activity (Fox et al., 1993: 69).

Training is an implementation of a structured plan to improve the ability of sport exercising that contains the theory and practice materials consisting of methods, and implementation rules in accordance with the goals and objectives of the exercise to be achieved. In addition, training is the main device in the process of daily exercise to improve the quality of the human organ system function during exercise, so that it can facilitate the improvement of an

athlete in motion during exercise. As an example of the arrangement of training material in a single face-to-face meeting in general containing materials, such as: opening / introductory of exercise, warming-up, core exercises, additional exercises (supplement), and cooling down / closing. Training is done according to the dosage by combining three factors consisting of intensity, frequency, and duration of the training.

The meaningful training should be done in accordance with the appropriate dosage. The dosage of training consists of intensity, frequency, duration, and type of training (Siswantoyo, 2008: 127). The following is an explanation of the dose of exercise:

a. Training Intensity

The quality that indicates the severity of the exercise referred to as intensity. The amount depends on the type and intensity of exercise goals. Aerobic exercise uses heart rate according to Djoko (2000: 14) in general fitness the exercise intensity is 60% - 90% of maximum heart rate, and in particular the amount of exercise intensity depends on the purpose of the exercise. The intensity of exercise to improve cardiorespiratory endurance is between 75% - 85% maximum heart rate, while for the process of fat burning between 65% - 75% maximum heart rate.

b. Training Duration

Duration is a measure of the exercise length that can be performed each time. Duration can be expressed in terms of time, distance or calories (Sharkey, 2003: 111). Proper training is expected to give a good effect on improving the cardiorespiratory system. According to Djoko (2000: 17) to improve pulmonary, cardiac fitness and weight loss training, it takes 20-60 minutes. So it can be said that the duration of exercise to improve cardiorespiratory are 20-60 minutes in every training session.

c. Training Frequency

In doing the training to improve cardiorespiratory ability, there should be training frequency performed at least three times in one week. According to Giam (1993: 16), the frequency of exercise is 3 to 5 times a week (once in two days, if the training is done three times a week). To improve fitness takes exercise 3-5 times per week (Djoko, 2000: 13).

d. The Kinds of Training Activity

Training involving the whole body, such as walking, jogging, running, swimming, cycling, and aerobics can improve cardiorespiratory capability. According Sadoso (1992: 150) a body that is anaerobic activity (such as sprinting) is also not improving cardiorespiratory ability.

The proper exercise should apply the basic principles of physical training in order to achieve maximum performance of someone. The basic principles of effective practice are as follows:

a. Overload Training Principle

Overload refers to the observation that a system or tissue must be exercised at a level beyond which it is accustomed in order for a training effect to occur (Power, 2007: 621). Suharjana (2007: 88) states that the principle of overload training basically emphasizes workload undertaken which must exceed the capabilities, thus, the training should reach the threshold stimuli. It is intended that the physiological function system can adjust to the intended demands to improve. So, in creating and implementing a training program should be adhered to the principle of overload that can enhance the ability periodically.

b. Specificity Principle

Good exercise program should be selected specifically according to the needs of sports and games that will be done. According Sukarman (1986: 60) to be proficient in skills in certain sports, one must practice the sport. Special training for a sport or a game is for intended performance, leads to morphologic and functional changes related to the specifications with the sport in question (Bompa, 1994: 9).

c. Individual Principle

According to Bompa (1994: 13) individualization in training is a primary requirement of a training establishment for every athlete in less attention to the implementation process of the exercise, the training should be fun for every individual to his or her ability, potential, and in particular to study the properties of each sport branch. Every individual has different abilities, so that in determining training load, it must be adapted to each individual's ability.

d. Progressive Weight Training Principle

According Sukadiyanto (2002: 16) progressive training should be steadily, developed and sustained performed. A person who performs the training, the given load should be increased gradually, regularly and steadily until it reaches the maximum load (Bompa, 1994: 30). So it can be said that the process should be done continuously and increased following the preceding exercise before continuing.

e. Reversible Principle

According to Djoko (2000: 11), someone's fitness that has been achieved will gradually decline even disappear at all, if you do not exercise regularly with proper dosing. Muscles' ability that have been achieved will gradually decline even disappear altogether if there is no exercise done (Suharjana, 2007: 89). So it can be said that the adaptations that occur as a result of the exercise will gradually decrease and even disappear if the exercises are not done regularly with the proper amount of training.

A professional tennis athlete should be able to master the all basic techniques of playing tennis. In addition, physical factors may also affect the performance or appearance when competing. Therefore it is very necessary a training method that can give a meaning to the physical and technical capabilities. One of the proper training is by with weight training methods that help to provide muscle strengthening on certain muscle parts. According to Djoko (2000: 59 ) weight training is a form of training that uses weight equipment media to support the weight training with the goals to improve fitness , muscle strength , speed , muscle toning , muscle hypertrophy , rehabilitation , as well as weight increase and decrease. Weight training variation can be done using inner weight in the form of the body weight and external weight in the form of weight tools. At the time of physical training for tennis athletes, athletes often exercise using weights in which they are push - ups, sit - ups , or back- up. It also needs to be done using external load training to enhance the ability of the other physical components. This external loading process from can be used to improve the physical condition of tennis athletes, especially power.

This weight training is necessarily needed by tennis athletes to help improving their physical abilities while competing. The ability to hit the ball while playing tennis, both forehand and backhand groundstroke, serves, and smash overhaed that must be supported by the strength of a group of muscles that in order to get high power hit. Therefore, it is very necessary that proper weight training methods to train the related muscles is required for tennis. As stated by Faigenbaum (2009: 206), although most leg muscle contribute to this explosive action, the midsection, chest, and triceps are key players

The proper exercise to train leg muscles can be done with square method jumps, 90 degree jumps, lunge pass madical ball, ball medical side pass, back squats, leg press, dumbbell lunge, hip abduction, and hip adduction. With these trainings, all leg muscles can be trained, so that it is to contribute to the explosive movements in tennis game. To train the chest muscles can be done with a chest press exercise, butterfly, dumble chest press, pull over, bench press, push-ups, cross-over, and dumbbell fly. For the bicep curls, the training can be done by methods triceps kickback, triceps dips, push- down reverse, triceps extension, wrist curt , reverse curl and reverse wrist curls .

Weight training can be done with multiple systems or different methods. One of them with circuit training or better known as circuit weight training. This exercise is basically exercise performed by combining the principles of weight training and circuit training principles. This exercise is designed to increase muscular strength and endurance while training the aerobic system. Besides, these exercises can also be used to train the power, if done with a combination of speed and strength. Circuit weight training workout consists of several kinds of weight training that is structured into several stations with a light weight, given short break or no break between posts, done with a lot of repetition repetition, and some sets with break longer between sets.

According to Corbin and Lindsey quoted by Djoko (2009: 69) the character of circuit weight training includes: consisting of several types of drills, series, little rest between exercises, many reps, light weights, lifting weights repeatedly, starting exercise from small muscles to large muscles, done alternating between upper and lower limbs. In general, the portion of training can be presented in tabular form as follows:

**Table 1. Components and Portion of Training**

Components	Portion
Weight (intensity)	40%-80% Kemampuan maksimal
Amount of Training or Post	6-12
Every Set Repetition	10-25
Circuit	2-5
Break between Post	Tanpa istirahat-30 dt
Break between Circuit	< 1 mnt
Training Duration	8-16 Mg

Reference: Djoko (2009: 69).

The training program can be run optimally with satisfactory results if done in accordance with the appropriate dose of exercise. This program can be applied to the sport of tennis athletes with targeted exercises for the leg muscles, chest muscles, and arm muscles. The method of circuit weight training exercise with the intensity of loading at 80% done with the fast rhythm power will be able to train groundstrokes during a blow for tennis athletes. It also will train explosive movement capabilities so as to enhance the performance when competing. The training program for tennis athletes can be presented as follows:

**Table 2**  
**Weight Training Program for Tennis Athlete**

Kind of Training	Training Portion	Explanation
<b>Main Training:</b> Weight Training	Frequency: 3 times /week Intensity: 40-80 % RM Set: 2-5 Sets Rep: 10-25 times Recov: no break-30 seconds between posts Recov: < 60 seconds between sets	Continuous Training Total Posts: 6-12 Rhtym: fast/ explosive Method: <i>circuit training system</i>
<b>Complementary Training:</b> Aerobic with medium intensity	Frequency: 3 times a week Intensity: 65-75 % MHR Duration: 20-60 minutes	Training to improve cardiorespiration ability

## CONCLUSION

Tennis athletes need physical and technical abilities when competing in order to obtain maximum performance results. A good technical ability is not enough to be a provision in a game, but it must be balanced by physical ability. Tennis athletes also require weight training to train the muscles that contribute significantly to the current play. The muscles that contribute while playing tennis are leg muscles, chest muscles, and arm muscles. One of the training methods to train these muscles is with weight training method. The weight training program was conducted by the method of circuit weight training with a fast rhythm, the intensity is 40-80 % RM and the frequency of exercise is 3 times / week . This exercise uses 6-12 recovery posts between 0-30 seconds. This exercise should be done 2-5 sets with 10-25 reps and recovery between sets which is < 60 seconds. In these exercises, it can also be added as an additional aerobic exercise to improve the cardiorespiration fitness. As a complementary exercise or training, aerobic exercise can be performed with 3 times / week frequency, 65-75 % MHR intensity and duration of 20-60 minutes.

## REFERENCES

- Arma Abdoellah. (1981). *Olahraga untuk perguruan tinggi*. IKIP Yogyakarta.
- Bompa, T.O. (1999). *Periodization of strenght the new wave in strenght training*. Canada: Copywell.
- \_\_\_\_\_. (1994). *Theory and methodology of training*. (Terjemahan). Bandung: Program Pascasarjana Universitas Padjadjaran Bandung. Buku asli diterbitkan tahun 1994.
- Djoko, P. I. (2000). *Panduan latihan kebugaran (yang efektif dan aman)*. Yogyakarta: Lukman Offset.
- (2009). *Peranan jogging dan circuit weight training pada profil lemak tubuh dan kebugaran aerobik penyandang overweight*. Makalah, tidak diterbitkan, Universitas Negeri Surabaya. Surabaya.
- Faigenbaum A.D., Wescott W.L. (2009). *Youth Strength Trainig*. United State: Human Kinetics.
- Fox Edward, ect. (1993). *Sport physiology, (third edition), bowling green*. Ohio: Wm. C. Browan Pulhishers.
- Giam, C. K. (1993). *Sport medicine, exercise and fitness* (Hartono Satmoko. Terjemahan). Jakarta: Binarupa Aksara. Buku asli diterbitkan tahun 1992.
- Power, S. & Howlen, E. (2007). *Exercise physiology*. United States: McGraw-Hill Companies, Inc.
- Sadoso Sumosardjuno. (1992). *Pengetahuan praktis kesehatan dalam olahraga*. Jakarta: PT Gramedia Pustaka Utama.
- Sharkay, J.B. (2003). *Fitness and health*. (Eri Desnarini Nasution. Terjemahan). Jakarta:PT. Rajagrafindo Persada. Buku asli diterbitkan tahun 2003.
- Siswantoyo. (2008). *Sport medicine dan permasalahannya*. Proceeding. (Seminar Olahraga Nasional Ke II). Halaman. 127-137.

- Soekarman. (1986). *Dasar olahraga untuk pembina, pelatih, dan atlet*. Jakarta: CV. Haji Masagung.
- Suharjana. (2007). *Latihan Beban: Sebuah Metode Latihan Kekuatan*. *Jurnal Ilmiah Kesehatan Olahraga, MEDIKORA*, Vol. III, No.1, 80-101.
- Strand, B.N & Wilson Rolayne. (1993). *Assesing sport skils*. Campain: Human Kinetics Publishers.
- Sukadiyanto. (2002). *Teori dan metodologi melatih fisik petenis*. Yogyakarta: Fakultas Ilmu Keolahragaan UNY.

# **A REVIEW NUTRITION INTAKE BEFORE COMPETITION AND FACTORS INFLUENCING WOMEN'S SWIMMING ATHLETES IN SWIMMING CLUB PADANG**

**Anton Komaini<sup>1</sup>, Tika Sebrina<sup>2</sup>**  
**Padang State University, Indonesia**

## **Abstract**

Target of research to know Nutrient Supplement before contest and factor influencing at atlet swim Women'S Swimming Club Padang. This Research descriptive research by using primary data and sekunder. Population in this research is atlet swim Women'S Swimming Club Padang amounting to 10 people. Intake of sampel conducted with total technique of sampling amounting to 10 people. To get research data used by IMT tes and use enquette. Data analysed by using technique analyse descriptive statistical which use frequency. Result of statue analysis of nutrient atlet swim Women'S Swimming Club Padang owning body weight less counted 5 people (50%), normal body weight counted 4 people (40%), and body overweight 1 people (10%). As for influencing status of Nutrient most education of men old fellow 80% and woman old fellow 70% graduation of SMA / SMK, most work of father 80% as woman old fellow and entrepreneur 80% as housewife, earnings of father equal to 50% counted 2 million - 2.5 million and mother counted 30% counted 3 million, knowledge of and food of Nutrient have category is and good counted 40%, most food consumption have international class 989-1248 counted 30%, energy go out to through activity counted 30% owning international class 2513-2992, while Nutrient Supplement influence status of Nutrient other depict habit eat not regular atlet and lack of knowledge of Nutrient-Based on to result of research can be concluded that status of Nutrient atlet swim Women'S Swimming Club Padang 50% owning heavy category of body less and factors influencing status of Nutrient have category of Nutrient low.

**Keyword:** statue of nutrient , nutrient supplement

## **INTRODUCTION**

One of The popular athletic branch enough and applied in social activities in fatherland is athletic branch of swim. Indonesia develop swim athletics utilize to reach achievement athletics, athletic of recreation athletics and education. Construction of swim athletics have to be developed to through construction and seed which organiz and structure. Construction system have to start from smallest bevy is till constructed to through the official member of branch of PRSI. In order to improving athletic contribution as one of the effort to increase the quality of human resource, hence activity of done athletics do not only socializing society athletics and athletics but rather from that is to reach maximal achievement in an athletic branch.

Development of achievement athletics very needed once in attainment of health of optimal society and make-up of quality of society. This matter as according to Law System Sportmanship of National of No. 3 year 2005 fourth shares section 27 article 4 about Construction and Development of Athletics Achievement, that is: "Construction and development of achievement athletics executed by is powered of bevy of athletics, growing to develop sentra construction of athletics having the character of National and area, and also carry out competition by have ladder and continuation".

West Sumatra represent one of the Provinsi developing swim athletics utilize to reach achievement. Many club giving construction to create swim atlet which have potency to advocate Sub-Province area / town till National, Regional and International specially in Town Field. According to Sajoto (1995:2) determinant attainment of prima achievement of atlet in athletic branch that is 1) aspect of Biologis cover the condition of physical, body organ function, body structure and postur and also Nutrient 2) Psychological aspect cover intellectually, motivation, personality, coordination work nerve and muscle 3) Environmental aspect cover

social, facilities and basic facilities, weather / family and climate 4) Supporter aspect cover coach, practice program, appreciation, orderly athletic organization and fund.

At athletic branch of swim gift of food with vitamin of Nutrient which enough very is influencing of achievement of atlet. A atlet which consuming food with well-balanced Nutrient by planned and program will reside in at status of Nutrient optimal and can maintain achievement primaly. status of Nutrient optimal happened if body obtain;get enough Iihat vitamin of Nutrient used efficiently so that enable growth of physical, growth of brain, ability of health and activity in general.

. Situation of good health can reach with accomplishment of well-balanced Nutrient matching with requirement of Iihat vitamin of Nutrient atlet. Concerning Iihat vitamin of Nutrient hand in glove of its bearing with food and beverage, because in a food there are vitamins of Nutrient which is very needed by body. According to Depkes RI (1995) well-balanced Nutrient represent vitamin which consist of carbohydrate, fat, protein, vitamin, mineral, fibre and water in this Nutrient mean many there are at]food. Therefore consume food to a atlet shall earn serious attention, by mistake arrangement of food at atlet can harm appearance of them. Good Food for atlet is well-balanced food (diet balanced) that is food in compilation do not only adapted for requirement of energi in just calorie, but have to be paid attention also vitamin composition of Nutrient other. According to Husaini in Depkes RI (1995) food determine appearance of atlet in so many matter. At elementary practice storey;level, good Nutrient play important role in maintaining optimal health which make atlet can exercise and have competition to better also.

Padang Town have many constructed to swim club start from beginner storey;level till become atlet have achievement. One of the swim klub which there are inPadang Town is Women'S Swimming Club Field which have address to Road;Street Batang Kampar Padang, precisely in Stadium Swim Lotus of Gor Agus Salim Field. As for event-event which have been followed by Women'S Swimming Club Padang start from National storey; level until International. Championships of National which have been followed by atlet swim the following Women'S Swimming Club Padang: Championship Of Area of Se West Sumatra, PORDA (Week of Athletics Area) each;every 2 year once, KRAPSU (Championship Of Swim Between Bevy of West Sumatra) every year in October, KRAPSI (Championship Of Swim Between Bevy of Indonesia) every year in September, INVITASI Swim Indonesia before POUND (Week of Athletics National) each;every 4 year once, KEJURNAS (Championship Of National Group Age) every year in May, and POUND (Week Of Athletics National). While International championships which have been followed by atlet swim the following Women'S Swimming Club Field: ITS it SAMAKKI (Championship Of Swim Between Bevy of ASEAN) every year, ASEAN Age Group every year, SEA GAMETE, Championship Of Asian Swim (Asian Swimming Competition).

Practically ability of atlet swim inPadang Town, not yet plucked result of which either from each;every contest which have been followed by goodness a] area storey;level, National, Regional and also is International. Based on to observation early can be seen that status of Nutrient and or atlet Nutrient Supplementswim Women'S Swimming Club Padang less is paid attention. Because most atlet have less thin or body weight. This to possible make got achievement disagrees with what expected. There are some factor influencing like food and Nutrient, motivation, practice program, coach, facilities and basic facilities, environmental and also and family. But with combination which either from talent and also practice technique and best coach, uneven and ineligible food of course will not yield optimal achievement. From some fact and factor influencing achievement of atlet swim inPadang Town, writer interest to do research at scope Evaluate Nutrient Supplement before Contest and Factor Influencing at Atlet Swim Women'S Swimming Club Padang.

Athletic of swim represent athletics with activity in water which direct other athletic branches. According to Dinata (2003:4) athletic branches which under wings of PRSI among others, athletic branch of swim, athletic branch hop to respect, athletic branch of waterpolo, athletic branch of beautiful swim and athletic branch of open territorial water swim. PRSI



founded in the year 1951 so that this organizational main is obliged to manage and develop fifthly of athletic branch above carefully.

Swim represent a different athletics of other athletics, that thing seen from place do it that is underwater. Swim athletics represent big athletics of its benefit, because if someone swim hence entire/all its body make a move active because entire/all body will get pressure of foot/feet and water and also his arms have to always make a move if not he/she will immerse in water. Athletic of swim evaluated from its benefit represent skill form which good for saving x'self, as achievement athletics and recreation. To reach high achievement is athletic area of swim is not a[n easy work and quickly, but representing difficult matter and need sufficient time. Basically, atlet eorang agars can master athletics swim hence needed bydone practice process by repeatedly in range of time which relative.

According to Syafruddin (2011:75) athletic achievement represent result of reached maximal effort a atlet in the form of skill and ability finish good movement duties in activity of practice and also in contest by using rational and clear evaluation parameters. Achievement a atlet represent result of from passed to practice and construction is atlet through contest and practices which is program better and is directional. Attainment of achievement of atlet determined and influenced by many factor, marginally can be grouped to the two factor that is factor eksternal and internal factor and Factor Eksternal.

Factor Eksternal is factor influencing achievement of atlet coming from outside x'self of atlet, or from outside potency had by atlet. factor of Eksternal which possible have an effect on to achievement of atlet for example, organization, Nutrient , weather and climate, facilities and basic facilities, environmental, audience, family and also coach with its practice program and others. While internal factor is factor coming from within x'self of atlet with all owned potency. Efficacy of achievement posed at or presented a atlet in a contest is especially determined and influenced by potency or ability of atlet itself inwroughtly, goodness ability of physical, technique, ability and tactics way of thinking it.

Term of Nutrient come from Arab language that is " giza" meaning food vitamin, in English recognized with term of nutrition meaning vitamin or food-stuff of Nutrient or often interpreted as nutrition. According to Syafrizar and of Wilda Welis (2008:3) food is materials besides pregnant drug of Iihat vitamins of Nutrient and or elements / chemical bond able to be turned into Iihat vitamin of Nutrient by body, which good for if/when included into body. While food-stuff is food in a state of is raw. According to Djoko (2006:2) broadly, Nutrient interpreted by as an organism process use consumed food normally through ingestion, absorbtion, transportation, depository, metabolism and expenditure of Iihat vitamin of Nutrient to maintain life, normal function and growth of body organ and also yield energy.

In obtaining optimal achievement, require to be compiled by planning of food expect, goodness short-range, long-range and also middle meter is later on formulated in program planning of food of atlet. Arrangement of food before contest very needed by a atlet, because various athletic branch have different contest time durasi, so also light weighing of contest him. As for for contest to certain period, sometime quickly tardy sometime (intermittent) like athletic branch of swim. system of Energi which share aliance among and aerobik of anaerobik.

Food before contest only sharing small in providing energi, but require to be given to obviate to feel fatigue and peckish so that achievement atlet can as optimal as possible. In fact there no special food able to boost up athletic achievement, but arrangement of pattern eat will have an effect on to appearance of atlet. For that, diet before contest require to be planned better during contest of atlet do not feel lacking of food. Give diet regularly and obviate heavy meal which is difficult to be digested.

Two till three hour before contest, atlet require to be provided by food with light menu, but is high of carbohydrate (better in the form of complex carbohydrate, because besides containing available carbohydrate also Iihat vitamin of Nutrient other like absorbent mineral and vitamin slowly). Stomach which is the full of food will bother moment performance contest. Despitefully, energi cannot be poured fully for external aktifitas because food metabolism of butuh separate energi (SDA: Specific Dinamic Action) for carbohydrate 6-7%, fat 4-14% and

protein 30-40%. Basically each;every inquiring atlet of food what best which must be eaten by before contest. Food before contest better consist of light food which have been recognized or habit consumed, because food have emotional meaning and have to be seen that by stress before contest will have an effect on to achievement of atlet. According to Almatier ( 2009:13) food consumption by family or society base on the amount of food bought, way of cooking food, distribution in habit and family eat alone. This matter hinge also at earnings, religion, habit and education of pertinent society. status of Nutrient optimal can reach with consumption and usage of food which either by body.

## RESEARCH METHOD

Based on to problems to be studied, hence this research have the character of descriptive which mean depict an situation, condition of, situation, event, activity and others this Place research executed by Stadium Swim Lotus H. Agus Salim which is have address to Jln. Batang Kampar Padang, while research time done in Mei-Juni 2013. Population in this research is the overall of atlet swim Women'S Swimming Club Padang amounting to 10 people. Considering the amount of small population relative, hence entire/all population amounting to 10 people made by sampel. Technique intake of sampel which used in this research is totalizing sampling. Technique data collecting in this research is by propagating or enquette of kuesioner to get picture and information about Nutrient Suplementbefore factor and contest influencing at atlet swim Women'S Swimming Club Padang. Type Data in this research is primary data and data of sekunder. Primary data obtained through direct interview with responder and through kuesioner. Primary data cover responder characteristic data, data knowledge of Nutrient , heavy data of high data and body of body. data of Sekunder is got data of side of klub swim cover data of amount of atlet, practice schedule and public picture of research location. Data-Processing of anthropometri for the assessment of status of Nutrient can be done by that is seeing status of Nutrient by counting Index Mass Body ( IMT) or of Body Mass Index ( BMI), with formula:

$$IMT = \frac{\text{Weight (Kg)}}{\text{High(M)}^2} \quad (1)$$

**Table 1. Classification Status of Nutrient .**

<b>Norma Status Gizi</b>	<b>Klasifikasi</b>
IMT < 18.4	Under Weight
IMT 18.5 – 22.9	Normal
IMT > 23	Over Weight

## RESEARCH RESULTS AND DISCUSSION

Conducted Analysis to got by data in field at this research is to know picture of Nutrient Suplementbefore factor and contest influencing at atlet swim Women'S Swimming Club Padang, after data collected through interview and by using enquette

**Tables 2. Statue of Nutrient Responder**

<b>No</b>	<b>Kategori</b>	<b>Frekuensi</b>	<b>Persentase</b>
1	Under Weight	5 orang	50 %
2	Normal	4 orang	40 %
3	Over Weight	1 orang	10 %
<b>Jumlah</b>		<b>10 orang</b>	<b>100%</b>

Based on to tables of above, hence can be elaborated that from 10 responder people, owning status of Nutrient heavy of body less counted 5 people (50%), normal body weight counted 4 people (40%), and body overweight 1 people ( 10%). To be more status picture sharpness of Nutrient the can be seen by histogram 1 following:

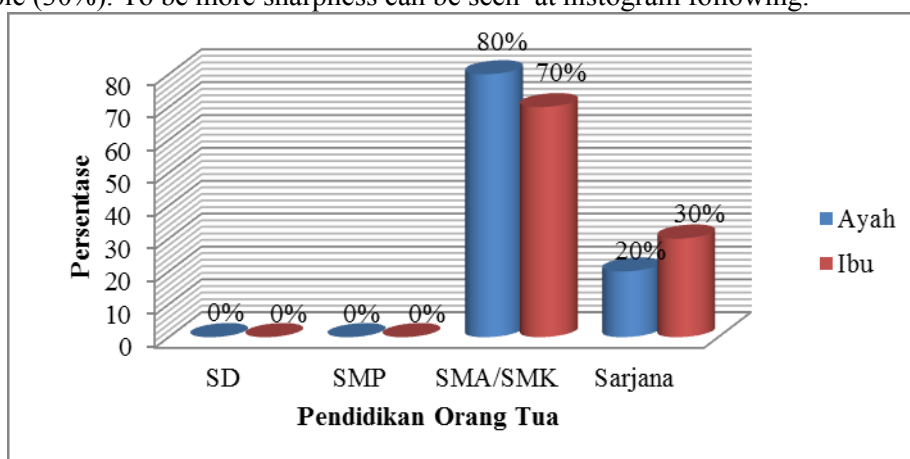


Picture 1. Statue of Nutrient Responder.

Tables 3. Distribution Education of Old Fellow Responder Parents education Responden

No	Education Parents	Father		Mother	
		Frequency	Percentage	Frequency	Percentage
1	SD	0	0	0	0
2	SMP	0	0	0	0
3	SMA/SMK	8	80	7	70
4	Sarjana	2	20	3	30
Jumlah		10	100	10	100

Based on to tables of above, can be elaborated that most men old fellow of responder nothing that finish of SD, nothing that finish of SMA / smk, finish of SMP 8 people ( 80%) and Master finish 2 people ( 20%). Hereinafter most woman old fellow of responder nothing that finish of SD, nothing that finish of SMP, finish of SMA / SMK 7 people (70%) and Master finish 3 people (30%). To be more sharpness can be seen at histogram following:

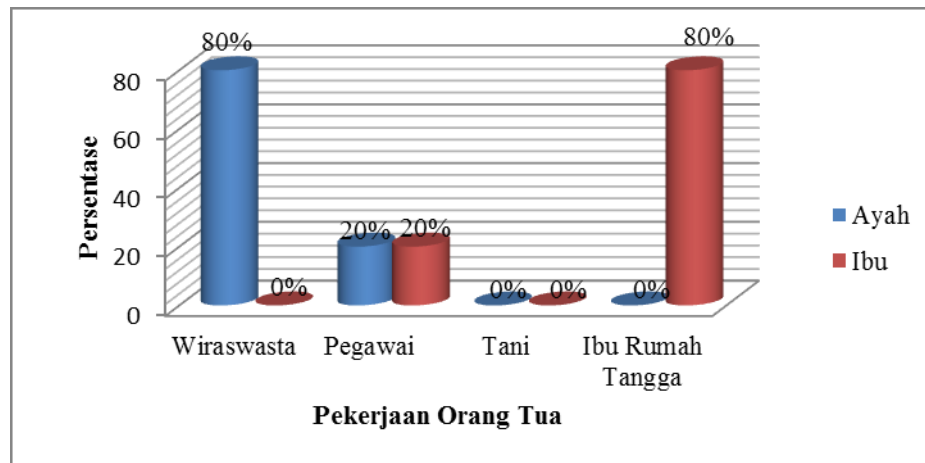


**Picture 2. Distribution Education of Old Fellow Responder.**

**Table 4. Distribution parents work Responden**

No	Parents	Father		Mother	
		Frequency	Percentage	Frequency	Percentage
1	Entrepreneur	8	80	0	0
2	Employee	2	20	2	20
3	Farmer	0	0	0	0
4	Housewife	0	0	8	80
<b>Jumlah</b>		<b>10</b>	<b>100</b>	<b>10</b>	<b>100</b>

Based on to tables above, can be elaborated that work of men old fellow of reponden most enterpreneur counted 8 people ( 80%), Officer counted 2 people ( 20%) and there is no as Farmer. Hereinafter most work of woman old fellow of responder is there no as enterpreneur, Officer counted 2 people ( 20%), there no as Farmer and Housewife counted 8 people ( 80%). To be more sharpness can be seen by histogram following:

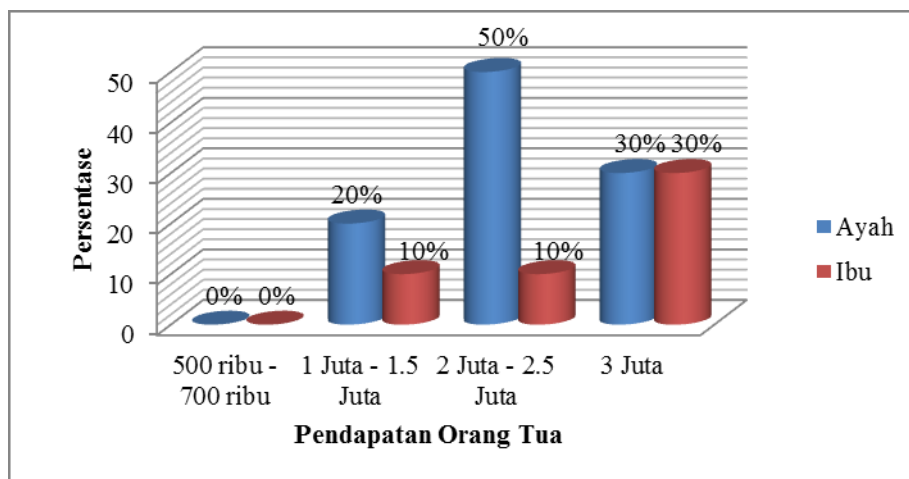


**Picture 3. Distribution Work of Old Fellow Responder**

**Table 5. Distrubution parents income of responden**

No	Parents Education	Father		Mother	
		Frequency	Percentage	Frequency	Percentage
1	500 ribu - 700 ribu	0	0	0	0
2	1 Juta - 1.5 Juta	2	20	1	10
3	2 Juta - 2.5 Juta	5	50	1	10
4	3 Juta	3	30	3	30
<b>Jumlah</b>		<b>10</b>	<b>100</b>	<b>5</b>	<b>50</b>

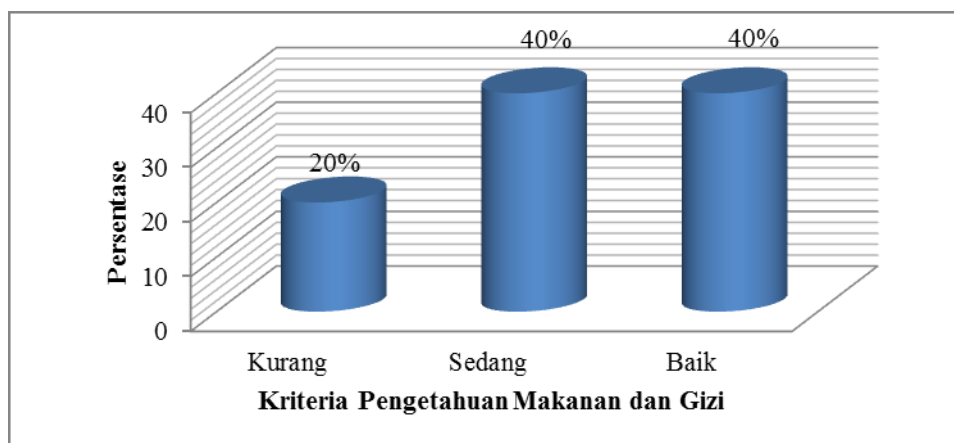
Based on to tables of above, can be elaborated that earnings of responder men old fellow most earnings 500 thousand - 700 thousand, 1 million - 1.5 million counted 2 people (20%), earnings 2 million - 2.5 million counted 5 people ( 50%) and earnings 3 million counted 3 people ( 30%). Hereinafter old fellow woman of responder most [there] no earnings 500 thousand - 700 thousand, 1 million - 1.5 million counted 1 people ( 10%), earnings 2 million - 2.5 million counted 1 people ( 10%) and earnings 3 million counted 3 people ( 30%). To be more sharpness can be seen by histogram following:



**Picture 4. Distribution Earnings of Old Fellow Responder.**  
**Tables 6. Distribution Knowledge of Food and of Nutrient .**

No	Nutrition criteria	Frequency	Percentage
1	Lack	2	20
2	Middle	4	40
3	Good	4	40
Jumlah		10	100

Based on to tables of above, can be elaborated that from 10 responder people, most having knowledge of and food of Nutrient which is that is counted 2 people ( 20%), knowledge of and food of Nutrient good counted 4 people ( 40%) and knowledge of and food of Nutrient less counted 4 people ( 40%). Clear to be more can be seen at following histogram:



**Picture 5. Distribution Knowledge of Food and of Nutrient**

Based on to result of habit data eat taken responder to 10 people of sampel, 1 people of sampel chosen to eat 2 times in one day, 1 people of sampel chosen to eat 4 times in one day and 8 people of sampel chosen to eat 3 times in one day and overall of breakfast sampel every day within a week. In each;every atlet have appetite different each other, but menu breakfast moment which often bread, milk, lontong, noodles and egg of pangsit. Most atlet buy food of jajanan, but there is also atlet chosening do not buy food of jajanan. Menu formation lunch and dinner, and also beverage type adapted for by each desire of atlet. Do not all atlet which

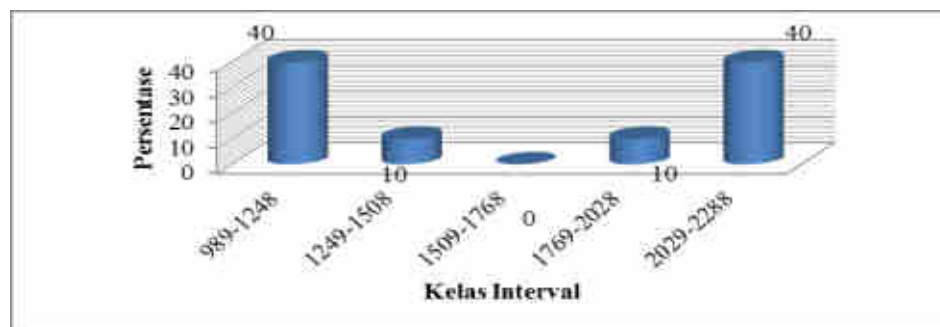
consuming athletic beverage, and problem of abstention food type merely there are some just people of atlet natural.

Based on to result of data consume taken responder energi to 10 people, got highest score 2285,6 and score of terendah 989,6, while range (apart measurement) 260. Based on to group data mean count (mean) 1597,4 and middle value ( median) 1530,9 and standard deviation ( standard of deviasi) 514,4. Distribution result of data consume the the energi can be seen at tables hereunder.

**Tables 7. Consume Energi Responder**

Interval class	Frequency	Percentage
989-1248	4	40
1249-1508	1	10
1509-1768	0	0
1769-2028	1	10
2029-2288	4	40
Jumlah	10	100

Based on to tables of above, can be elaborated that from recall consume food of sampel 2 x 24 hour most food konsumsi reside in [at] international class 989-1248 counted 4 (40%), international class 1249-1508 counted 1 (10%), international class 1509-1768 counted 0 (0%), international class 1769-2028 counted 1 (10%) and international class 2029-2288 counted 4 (40%). To be more sharpness can be seen at histogram following:



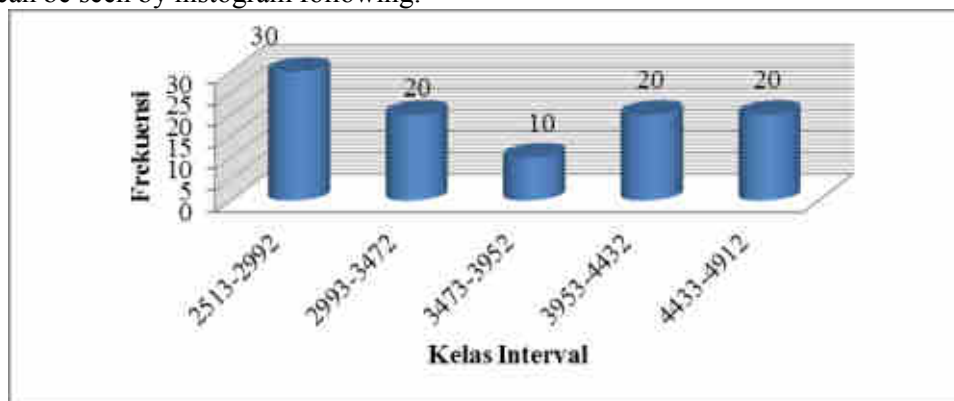
**Picture 6. Consume Energi Responder**

Based on to result of data of energi go out to pass taken responder physical activity to 10 people, got by highest score 4895,1 and score of terendah 2513,9, while range (apart measurement) 480. Based on to group data mean count (mean) 3592,6 and middle value (median) 3611,0 and standard deviation (standard of deviasi) 844,9. Distribution result of data of energi go out to through the physical activity can be seen by tables hereunder.

**Table 8. Output energy**

Kelas Interval	Frekuensi	Persentase
2513-2992	3	30
2993-3472	2	20
3473-3952	1	10
3953-4432	2	20
4433-4912	2	20
Jumlah	10	100

Based on to tables of above, can be elaborated that energi go out to pass physical activity most residing in at international class 2513-2992, that is counted 3 ( 30%), international class 2993-3472 counted 2 ( 20%), international class 3473-3952 counted 1 (10%), international class 3953-4432, counted 2 ( 20%) and international class 4433-4912 counted 2 (10%). To be more sharpness can be seen by histogram following:



**Picture 7. Energi Go Out Through Activity Physical**

### **Solution**

Based on to result of analysis which have to be drawn that status of Nutrient atlet reside in [at] category less, with status of Nutrient heavy of body less counted 5 people (50%), normal body weight counted 4 people ( 40%), and body overweight 1 people ( 10%). Based on to data above known that most atlet have body weight less because of lack of attention about habit eat, uneven and also calorie him enter with exit calorie. Atlet in general less understanding about lihat vitamin of Nutrient what there are in food and its function to their body. Lack of the amount of calorie which enter into body and too much him off[is amount of secretory calorie. If someone do not understand elementary principle of Nutrient and do not know requirement of Nutrient obtained from all kinds of food, and also the amount of calorie enter and exit. Very difficult for them to have required by body, and also for the man who do not know how much/many calorie which enter and balance the amount of secretory calorie. Furthermore of him, mount knowledge of Nutrient , earnings of old fellow, habit eat, food consumption and also physical activity of atlet have an effect on to status of Nutrient atlet.

Based on to analysis which have been done/conducted to be to be got [by picture that status of Nutrient atlet according to education of old fellow most men old fellow of finish responder of SMA / smk that is counted 8 people ( 80%) and most woman old fellow of finish responder of SMA / smk that is 7 people (70%). According to Reodjito (1989) height education of old fellow relate to the amount of earnings, what finally relate to food amount and quality which is ordinary to be bought by family while education of mother relate to food distribution pattern in nursemaid pattern and family. But someone which is have low education [to] not yet of course indigent compile food fulfilling conditions of Nutrient if/when compared to one who have higher education, because even if education of it] lower if the people diligent listen counselling of Nutrient , information of Nutrient of others, media print and media of eloktonik non is impossible of knowledge of Nutrient will be more goodness.

Based on to analysis which have been done to be to be got by picture bring status of Nutrient atlet according to work of old fellow most men old fellow of responder as entrepreneur that is counted 8 people (80%) and most woman old fellow of responder as housewife that is 8 people ( 80%). status of Nutrient determined from storey;level work of old fellow. Work excelsior progressively nicely status of Nutrient so also on the contrary work relate to production determining dish to be presented by everyday family.

Based on to nalysis which have been doneto be to be got by picture bring status of Nutrient atlet according to earnings of old fellow most men old fellow of responder have earnings 2 Million - 2.5 million that is counted 5 people ( 50%) and most woman old fellow of responder have earnings 3 million that is 3 people ( 30%). Based on to at result of analysis

which have been done to be to be got by picture that status of Nutrient atlet according to knowledge of Nutrient got to reside in to be categorized by Nutrient which is%. Height knowledge of Nutrient relate to food consumption. Based on to result of analysis which have been done to be to be got by picture that status of Nutrient atlet according to habit eat very is influencing of status of Nutrient . If too much eating food which is not nutritious tend to to make status of Nutrient someone less. Because diffraction eat have to as according to well-balanced menu. Atlet owning habit eat jajanan not yet of course its status of him of goodness. Because food of snack consumed not yet of course nutritious altogether.

According to Depkes RI ( 1995), habit eat good of form will if pattern eat individual adapted for Guidance Of Public of Nutrient Well-Balanced consisting of 13 message of well-balanced Nutrient , that is 1) eating food miscellaneous 2) eat food to fulfill sufficiency of energi 3) eat food off[is source of carbohydrate, semi from requirement of energi 4) limit fat consumption and oil until a quarter of sufficiency 5) use iodized salt 6) eat food off[is source of ferrum 7) giving just ASI at baby old age 4 months 8) accustoming breakfast 9) drink clean water, 10) doing activity of athletics and physical regularly, 11) avoiding grog, 12) eating peaceful food to health and 12) reading lable at tidy food

Based on to result of analysis which have been done to be to be got by picture that status of Nutrient atlet according to food consumption reside in international class 989-1189 counted 6 ( 30%). status of Nutrient determined by factor consume food. Excelsior consume food progressively more someone Nutrient and progressively lower ugly someone food consumption progressively its status of him. Food consumption relate to physical activity. Because amount of consumed by calorie is someone have to be well-balanced with amount of [released] calorie with activity malakukan, so that yield normal body weight. Because too much food consumption will make excessive body weight ( obesitas). According to Soekirman (1999) one of the factor having an effect on to status of Nutrient someone is Nutrient Supplementof food consumption

According to Sediaoetama ( 1996) status of Nutrient someone very depended from its consumption storey;level, while consumption storey;level determined by dish amount and quality, [the] mentioned shown with existence of all Iihat vitamin of Nutrient needed by body in dish formation and comparison which is one to the other. Based on to result of analysis which have been done to be to be got by picture that status of Nutrient atlet according to physical activity got to reside in [at] international class 2531-3081, that is counted 6 ( 30%). status of Nutrient determined by physical activity factor and everyday activity. Activity someone excelsior progressively lower its status of him. Because physical activity have to be well-balanced with required by food consumption body. Activity physical height will cause its tired and downhill health someone. To the number of secretory calorie of body of status meyebabkan of Nutrient less ( body weight less). According to Sediaoetama ( 1996) requirement of Iihat vitamins of Nutrient influenced by body weight, age, activity and gender. At teen-age with its growth.

According to Hariyadi ( 1999) balance of energi [is] important to maintain healthy body to weight and also check off all food and beverage into active healthy life style, including to consume food of Nutrient well-balanced and enough beranekaragam in number requirement, and also do physical activity regularly. Energi enter to represent energi coming from eaten food representing the source of energi. Energi got from chemical bond at food elaborated to is later;then used in the form of phosphate tying of berenergi high at ATP. This Energi can be used to work biologis or kept in body for requirement wait. Exit Energi represent the amount of energi released by body, representing combination among discharged heat and activity to environment.

The balance of Energi depict relation among calorie (consumed energi) of food and beverage and calorie ( energi) burned by body. To most people, if/when calorie (MASUK) = calorie (EXIT), hence body weight will fixed or stabilize. If/When abysmal asupan of expenditure on an ongoing basis, hence body weight will go up. On the contrary if/when burned calorie more on an ongoing basis compared to which consumed, hence happened heavy



degradation of body. Although balance of energi possible seen like a simple concept, long-range health require management actively equation both sides above. This include;cover understanding of requirement of body energi, for example physical activity impact, and get knowledge about food and beverage calorie content. This matter also include;cover behavior learn in operation of portion, and arrange the amount of calorie in food to assist to to manage energi asupan. Research sign that everyday small decision, like deciding how many to be eaten and dranked, step on staircase or elevator, and even do watching body weight or [do] not, earn to affect big at body weight and health along with time. Based on to result of from research which have been done to atlet swim Women'S Swimming Club Padang, level of calorie enter incommensurate to level of exit calorie. Because calorie go out bigger than calorie entry.

## CONCLUSION AND SUGGESTION

Based on to data analysis and language, hence can be concluded that

1. Most status of Nutrient atlet swim Women'S Swimming Club Padang owning body weight less counted 5 people ( 50
2. Most education of finish old fellow of SMA / smk. Education of old fellow have an effect on to status of Nutrient atlet, because lowering of earnings will lessen status of Nutrient someone
3. Most work of old fellow of enterpreneur housewife and. Work of old fellow have an effect on to status of Nutrient atlet
4. Knowledge of and food of Nutrient atlet have category [is] and good counted 40
5. Food consumption to status of Nutrient atlet counted 40%, because amount of calorie which enter have to be well-balanced with amount of secretory calorie
6. Physical activity to status of Nutrient , because calorie which enter have to be well-balanced with secretory calorie Pass activity counted 30%.

As according to research result and conclusion above, hence can be told some the following suggestion:

1. expected to old fellow to increase consume food which is well-balanced and high bernutrisi
2. Expected to atlet to increase knowledge of Nutrient so that in election of food earn more effective to be consumed
3. To be expected to atlet in habit eat have to chosen food, so that consumed food as according to requirement of body
4. Expected to atlet to balance food consumption with physical activity,so that getting normal body weight
5. Expected to atlet owning normal body weight so thatcan maintain him/ while to atlet owning body weight lessso thatcan add body weight and improve status of Nutrient as according to requirement, and to atlet owning body overweight so thatcan degrade status of Nutrient as according to requirement

## REFERENCES

- Arikunto, Suharsimi. 2002. *Metodologi Penelitian*. Jakarta: PT. Rineka Cipta.
- \_\_\_\_\_. 2010. *Prosedur Penelitian Suatu pendekatan Praktik*. Jakarta: PT. Rineka Cipta.
- Almatsier, Sunita. 2009. *Prinsip Dasar Ilmu Gizi*. Jakarta: PT. Gramedia Pustaka Utama.
- Baliwati, Yayuk Farida. 2004. *Pengantar Pangan dan Gizi*. Bogor: Penebar Swadaya.
- Berg, Alan. 1986. *Peranan Gizi Dalam Pembangunan Nasiona*. Jakarta: CV Rajawali.

- Clark, Nancy. 1996. *Petunjuk Gizi untuk Setiap Cabang Olahraga*. Jakarta: PT. Grafindo Persada.
- Depkes RI. 1995. *Gizi Olahraga Sehat, Segar, Bugar dan Berprestasi*. Jakarta: Direktorat Bina Gizi Masyarakat.
- Departemen Kesehatan RI. 1997. *Buku Panduan Manajemen Penyuluhan Kesehatan Masyarakat Tingkat Propinsi*. Jakarta: Depkes RI.
- Depdiknas. 2010. *Buku Panduan Penulisan Tugas Akhir/Skripsi Universitas Negeri Padang*. Padang: UNP Press.
- Dinata, Marta. 2003. *Belajar Renang*. Ciputat: Cerdas Jaya.
- Hariyadi,P., Purnomo,E.H., Umaryadi,.E.W. dan Adawiyah,D.R. 1999. *Latihan Soal Prinsip Teknik Pangan*. Jurusan Teknologi Pangan dan Gizi, IPB.
- Marjohan. 2011. *Panduan Seminar dan Penelitian*. Padang: FIK UNP Padang.
- Marzuki, Chalid. 1999. *Renang Dasar*. Padang: FIK UNP Padang.
- Brown, Paul. 2001. *Object-relational database development: a plumbe's guide*. Prentice Hall, USA.
- Pekik, Djoko. 2006. *Panduan Gizi Lengkap Keluarga dan Olahragawan*. Yogyakarta: Andi Yogyakarta.
- Roedjito D. 1989. *Kajian Penelitian Gizi*. Jakarta: Mediyatama Sarana Perkasa
- Sajoto. 1995. *Peningkatan dan Pembinaan Kekuatan Kondisi Fisik Dalam Olahraga*. Semarang: Dahara Prize.
- Sediaoetama, A. D. 1996. *Ilmu Gizi untuk Mahasiswa dan Profesi. Jilid I*. Dian Rakyat, Jakarta.
- Soekirman. 1999. *Besar dan karakteristik masalah gizi Di Indonesia*. Jakarta: Akademi Gizi. Depkes. RI
- Syafrizar dan Welis, Wilda. 2008. *Buku Ajar Ilmu Gizi*. Padang: FIK UNP Padang.
- Syafruddin. 2011. *Ilmu Kepelatihan Olahraga Teori dan Aplikasinya dalam Pembinaan Olahraga*. Padang. FIK UNP Padang.
- Undang-Undang Sistem Keolahragaan Nasional No. 3 Bagian Keempat Pasal 27 Ayat 4. 2005. *Pembinaan dan Pengembangan Olahraga Prestasi*.
- Widya Karya Nasional. 2004. *Pangan dan Gizi*.
- Yusuf, Muri. A. 2005. *Metodologi Penelitian*. Jakarta.
- Zalfendi, dkk. 2012. *Gizi Olahraga*. Padang: FIK UNP Padang.

# PHYSICAL EXERCISE FOR EARLY CHILDHOOD TAEKWONDO

Devi Tirtawirya  
Yogyakarta State University, Indonesia

## Abstract

Physical exercise is crucial for sports enthusiast including Taekwondo. Physical exercise is better given as early as possible and specifically for Taekwondo should be address based on its levels. Those are early age, junior age and senior age. This paper will be discussing the physical exercise for Taekwondo early age athlete in accordance to their growth and development. Early childhood training activities require physical exercises that support and develop the potential that should be developed according to their needs. Physical exercise should be given to the Taekwondo early age athlete in the form of game. Game form physical exercise is more exhilarate and driven athlete to perform the exercise unconsciously. Moreover, the physical exercise must be adhered to the principle of multilateral. Physical exercise is proper and packed with the game form is not easy to be made, but this must be done by a Taekwondo coach. The results of the exercise are packed with forms of the game are expected to develop in height, bone length, increased body weight, increased muscle mass, physical fitness, physical exercise and thus do not interfere with growth and development. The increase of physical abilities of early childhood advocates in the hopes to be heading towards sports specialization phase in order to achieve the peak performance.

**Keywords:** physical exercise, early childhood taekwondo

## INTRODUCTION

Athletic training is continual process that is designed systematically and scientifically using proper method. Athletic training needs good planning with right principals so that it can proceed well. The purpose of planning for athletic training is to improve somebody's performance. Athletic training includes physical, technical, tactical, and mental training. Those four element must be conducted synergic so that we can achieve optimal achievement.

The purpose of physical training is to improve the body organ ability better and progress the athlete's performance. In this case is Taekwondo for children. However, the physical training for children is different with physical training for adult. Children is not small adult so we have to consider proper design for physical training that can support growth and development of children. Thus, physical training must adapt to the children's growth and development. In addition the training method must be fun for children.

According to ACC/NCAS (1992: 87) states that children play sport to achieve 4 purposes; achieving pleasure, establishing friendship, feeling well, and learning new skill. These purposes can be achieved if the athletic activity is set according children's needs and abilities. The category of children is those who are younger than 12 years old. Children have balance growth between height, weight, and muscle mass. The physical training design must be arranged appropriate with children's growth and development characteristic. Thus, the physical training should not disturb children's growth and development. In order to prevent boredom during training, the method must be designed as fun as possible.

Biomotor component or physique component is important factor for supporting children's achievement in Taekwondo. It includes power, durability, speed, flexibility, and agility. Though children need special treatment for the physical training, the training must consider multilateral training principle. In addition, the training would be better if presented as games. The main goal

of physical training for children is to prepare children's physique to support their achievement if they would be senior athletes.

## THE GROWTH AND DEVELOPMENT OF CHILDREN

The indication of children period is the regularity growth of children's height, weight, and muscle mass. The growth of children is quite fast, thus the physique treatment for them must be adjusted with their physique growth and development.

The motoric behavior development of children consists of 5 stages; reflective, elementary, basic movement, specific, and specialization.

**Tabel 1 Motoric Behavior Development**

Growth States	Stages	Examples of behavior characteristics
Before born – infancy (-5 months – 1 year)	Reflektif	Sucking, grabbing, flexion, extension, <i>postural adjustments</i>
Infancy (0 - 2 years)	Elementary	Rolling, sit, crawling, creeping, standing, walking, grabbing
Early children period (2 - 7 years)	Basic Movement	Lokomotor, nonlokomotor, manipulatif, dan movement realization Refining basic movement and movement realization; basic movement of dancing, games and sports, gymnastic movement, and aquatic activity
Middle – late period of children (8 - 12 years)	Specific	Penyempurnaan gerak dasar dan kesadaran gerak; gerak dasar tari-tarian, permainan/olahraga, senam dan aktivitas akuatik
Teenager - adult (more than 12 year)	Specialization	Recreational and or competitive activity

(Reference: Carl Gabbard, Elizabeth LeBlanc & Susan Lowy. *Physical Education for Children: Building the Foundation*. Englewood Cliffs, NJ: Prentice-Hall, Inc. 1987, p:22)

From the table above, according to Gallahue (20014) we can give some recommendations for children during early and late children period;

The characteristics of physique and motorik development during early children period

1. Height range from 33 – 47 inches (83,8-119,4 cm) and weight range from 25 – 53 pound (11,3-24,0 kg)
2. Perceptual motoric ability develops fastly. However, children still have confsion about body understanding, direction, time, and place awareness.
3. The sense of controlling urinating and solid wasting is established during this period. However, some unexpected things may happen.
4. Children can develop basic movement quickly in various motoric abilities. Bilateral movement such as jumping is the indication that it is hard movement than unilateral movement.
5. Children are more active and energetic. Thus, they prefer to run than walk. However, they still need a little time to take a rest.
6. The motoric ability is developed so that children can start to learn how to dress though they still need help to straighten and tighten particular part of the clothes.
7. Function and process of body are more ordered. Their physiological homeostasis is established well.

8. Boys and girls overcome same physique development.
9. Good motoric control is not established completely. However, it develop fast.

The characteristics of physique development and motorik during late children period

1. Height range is from 44 – 60 inches (111.8 - 152.4 cm) and weight range is from 44 – 90 pounds (20.0 - 40.8 kg).
2. Slow physique growth since the age of 8. Though the growth is slow, the development is ordered well.
3. Children's physique begins to stretch about 2 – 3 inches every year. In addition, their weight is augmenting every year about 3 - 6 pounds.
4. Big muscle in body would growth more than small muscle. It would clearly seen on their physique appearance.
5. Girls' development is faster than boys in matter of psychology development. Girls and boys begin to have different motive and interest.
6. They have slow reaction because of hard coordination between hands and foot. After this period ends, they would develop better reaction.
7. Children have low durability and easy to get tired. However, they have good reaction during training process.
8. The mechanism of perceptual vision has been fully developed.
9. Children prefer to use long distance vision rather than short distance vision.
10. Any activity using eyes, hands, and foot develop slowly such as volley, throwing ball, or any throwing activities that need training to be the expert.
11. This period indicate the transition from movement ability that is improved toward shaping transition movement ability for doing games and athletic skills.

We should use the characteristics of children growth and development as the guide to give proper physique training for children under 12 years old.

## **TAEKWONDO PHYSICAL TRAINING FOR CHILDREN**

Physical training for Taekwondo must be designed as good as possible. The method and design must be appropriate with children's physique growth and development in order to prevent damage on body organ system and delay physique development. Thus, physical training for children should be focused only on part of body that is safe and not disturb physique growth. Children should be though about physical learning to give them more movement affluence. Since they are children, the training method is different with training method for adult in matter of time, intensity, volume, type of training. The physical training for children is more easy and adjusted with children's ability.

Before we continue to the kinds of physical training for children, we must know important aspects on physical training for children (Pate, Rotella dan McClenaghan, 1984: 326-327). :

1. Weight training must be conducted very carefully. Weight training for children is focused on repetition only.
2. Any extrim endurance training with preasure for game is not allowed for children physical training. However ordinary endurance training without preasure is good for most children as long as there are no hard preasure such as marathon.
3. Children are not allowed to do tight diet.
4. Children are not allowed to do strict and individual training to prevent injury.

5. Any training program that include body contact must be high concern. Rules must be arranged to minimize injury risk. During body contact training, children must wear body protector. However, if we want more safe training, we should focus training for improving technic not to fighting training.
6. Children should not have any mental pressure especially from their parent. Mental pressure can influence the children's performance during training process. Thus, children should not be under pressure or any threat.

Bompa (1994: 71) states the purposes of training on the early stages ( 6 – 10 years);

1. Physical training and multilateral technique are good to develop movement and technique skill.
2. Developing body structure and posture harmonically
3. Developing coordination, balance, flexibility, and perception on various movement
4. Developing aerobic endurance for children without giving any stress
5. Developing concentration, imagination, discipline, and strong willingness to finish training task
6. Preventing winning pressure by not taking too many competition.
7. Proper training time intensity about 100 – 330 hours every year.

Bompa (1994: 71) also states proper training method that can be utilized during early stage:

1. Jumping, throwing, and running are good starting point for physical training.
2. Children need improvement for their skills such as swimming, basic aerobic, cycling, skating, and skiing.
3. They should learn how to hold ball in various kind of team sports through easy game with simple rules.
4. They should learn how to use sport equipments and tools.

## **MODEL OF PHYSICAL EXERCISE FOR EARLY CHILDHOOD TAEKWONDO**

Physical training model for children is similar with model for adult. However, physical training model for children has lower intensity and volume. Physical training for children is focused for 3 part of body; upper body, middle body, and low body. These are some examples of physical training.

### **1. Hanging**

This training is designed to train arm muscle. Hanging training is combination between running training and hanging training. Thus, this training is started with racing race toward the hanging spot.

Tools

- a. Hanging spot
- b. Whistle

How to do hanging training

- a. Split the group into 2 small group
- b. Right after whistle signal, first child will run
- c. When he arrive at the hanging spot, he must hang while slide along the hanging spot
- d. After he finish, he must run back toward his group
- e. Then the next child does the same.

Objective of the Training

- a. Training arm muscles
- b. Training sprint speed
- c. Training abdominal muscles
- d. Training competition sense



## 2. Push-up

Push-up is common training for any physique training. However, since this pushup training is for children, they do pushup using their knees as the stool. Children should do pushup only for 20 repetitions as their ability. They can repeat the training if their body can make it.

Tools

- a. Whistle
- b. Stopwatch

How to do it

How to do it

- a. Children place their hands hold their body straight with their knees.
- b. After the commands, they will begin push their body from the floor.
- c. They do push up according their ability. They should not force to do too many repetitions.

Objective of the training

- a. Training arm muscles
- b. Training abdomen muscles



Burhanudin Tsany. <http://taekwondo-seveners.blogspot.com/>

## 3. Pulling Each Other

Pulling exercise is and arm muscle training by pulling other hands that are hooked.

Tools

- a. Whistle
- b. Stopwatch

How to do it

- a. One hand is hooked with other hand from other children in while sitting.
- b. After the command, they begin to pull each other.
- c. Those who is drop would lose.
- d. Then they turn to do pulling training by using different hand.

Objective of the training

- a. Training arm muscles
- b. Training competition sense



#### 4. Stabilization

Stabilization is muscle training statically. The main aim of this training is to train abdominal muscles.

Tools

- a. Whistle
- b. Stopwatch

How to do it

- a. Children follow the Instructor's instruction.
- b. After the command, they do the same movement.

Objective of the training

- a. Training abdominal muscles
- b. Training arm muscles



#### 5. Sit-up

It is just regular sit-up training. Children do repetition according to their capability.

Tools

- a. Whistle
- b. Stopwatch

How to do it

- a. One child hold other child's foot that lay down in floor.
- b. The child who lay down must bent their foot.
- c. After the command, the child try to get up on sit position.

Objective of the training

- Training abdominal muscles





## 6. Sprint + dolyo chagi

This training is relay race. On the finish line every child must do left and right dolyo kick 4 times.

Tools

- a. Whistle
- b. Stopwatch

How to do it

- a. After the command, children race to the finish line.
- b. After they arrived on the finish line, they must do dolyo kick on the target.
- c. Then they back to the start line and relay to other children.

Objective of the training

- a. Speed
- b. Competition sense



Yuanita Nasution 2011.

<http://pembinaan-mental-atlet-usia-dini.html>

[http://news.xinhuanet.com/english/photo/2013-08/04/c\\_132600950.htm](http://news.xinhuanet.com/english/photo/2013-08/04/c_132600950.htm)

## 7. Plastic Ball Kick

The instructor bring plastic ball. It would be the target for the children to train kick technique. They must march to queue.

Tools

- Plastic ball

How to do it

- a. Instructor throws the ball toward children.
- b. The front queue would kick the ball using apchagi kick technique.
- c. After he kicks, he go to the back queue. The next queue will do the same.
- d. Do this repetition 5 times and then take a break.

Objective of the training

- a. Accuracy
- b. Coordination between eyes and foot



### 8. Popping Balloon

This training is designed to train footwork, strategy, durability and competition sense.

Tools

- a. Balloon
- b. Whistle
- c. Stopwatch

How to do it

- a. Every child's feet is tied with balloon.
- b. After the command, they would try to pop balloon on other children's feet using their own foot.
- c. The duration is adjusted with the children ability.
- d. If there is balloon which is not popped, then the instructor should give rest time for them so that they can rest.
- e. Break is good to prevent fatigue.
- f. Anyone who can pop others balloon is the winner.

Objective of the training

- a. Training coordination
- b. Improving durability
- c. Giving competition experience



### 9. Kissing Knees

This training is to train body's flexibility. This training commonly is done during stretching and cooling down. This training's objective is to train muscle flexibility on hips and back.



### 10. Split

This training is focused to train on leg flexibility. Children should do this training during stretching and cooling down. This training can train groin muscles.



### Conclusion

Physical training is important necessity for every sport branch especially Taekwondo. Every sport has its own physical training method because it has different physical need. However, children must not allowed to get same physical training intensity as adult because their bodies are not ready to overcome heavy intensity. We should understand that children are not small adult.

The method of physical training for children must be adjusted with their physique growth and development. Physique training should not disturb physique growth and development. Taekwondo physical training for children must be designed with low intensity. In addition, Taekwondo physical training should not apply hard drill and hard contraction because they can cause disturbance for physique growth and development.

### REFERENCES

- Bompa. Tudor O. *Theory and Methodology Of Training; The Key to Athletics Performance. Third Edition.* Iowa: Human Kinetics 1994
- Burhanudin Tsany. <http://taekwondo-seveners.blogspot.com/> Kamis, 3 September 2009
- Carl Gabbard, Elizabeth LeBlanc & Susan Lowy. *Physical Education for Children: Building the Foundation.* Englewood Cliffs, NJ: Prentice-Hall, Inc. 1987, p:22)
- Chu, Donald A. (1992). *Jumping Into Plyometrics.* Champaign, Illinois: Leisure Press.

Gallahue, David L. & John C. Ozmun. 2004. *Understanding Motor Development: Infants, Children, Adolescents, Adults.* Boston: McGraw Hill

[http://news.xinhuanet.com/english/photo/2013-08/04/c\\_132600950.htm](http://news.xinhuanet.com/english/photo/2013-08/04/c_132600950.htm)

Pate. McClenaghan. Rotella. terjemahan Dwijowinoto.K. "Dasar-dasar Ilmiah Kepelatihan", Semarang: IKIP Semarang Press. 1993

PDF. BINAAN MENTAL ATLET USIA DINI Oleh Dra. Yuanita Nasution, M. APP. SC., PSI.  
<http://luthfiramdiansyah.blogspot.com/2011/12/pembinaan-mental-atlet-usia-dini.html>  
Rabu 14 Desember 2011

The ACC/NCAS. 1992. *Coaching Children*. Canberra: Australian Coaching Council Incorporated.

# **CORRELATION BETWEEN PROTEIN, FAT AND CARBOHYDRATE WITH ARM POWER AND LEG POWER IN PENCAK SILAT COMBATIVE PELATDA DIY ATHLETE**

**Dwi Wahyuningsih<sup>1</sup>, B.M Wara Kushartanti<sup>2</sup>, Arta Farmawati<sup>3</sup>, B.J. Istiti Kandarina<sup>4</sup>, Mirza Hapsari Sakti Titis Penggalih<sup>5</sup>**

Gadjah Mada University<sup>1</sup>, Yogyakarta State University<sup>2</sup>; Gadjah Mada University<sup>3,4,5</sup>; Indonesia  
wahyu0928@gmail.com<sup>1</sup>, warakushartanti@yahoo.com<sup>2</sup>, a.farmawati@gmail.com<sup>3</sup>  
ikandarina@yahoo.com<sup>4</sup>, hapsa@yahoo.com<sup>5</sup>

## **Abstract**

Indonesian pencak silat performance in International game still low. The lack of nutrients approach was one of contributing factor. An adequate intake for pencak silat athlete still not being a concern. That is why a research about pencak silat athlete adequate intake needed. This study aimed to know the relation between energy, protein, fat and carbohydrate with leg power and arm power in pencak silat athlete. This research did with cross sectional method. Fifteen Athlete pencak silat tanding DIY chose as respondent. Intake of respondent measured 3 day with food recall 24 hours. Then measured arm power with medicine ball test and leg power with standing broad jump. Most of nutrient intake in PELATDA DIY athlete were low carbohydrate, protein and fat. A significant correlation founded between carbohydrate and power arm ( $p = 0,005$ ) with  $r = 0,678$  and carbohydrate and leg power ( $p = 0,023$ ) with  $r = 0,581$ . No significant correlation founded between protein with arm power ( $p = 0,651$ ) and leg power ( $p = 0,894$ ), then fat with arm power ( $p = 0,572$ ) and leg power ( $p = 0,723$ ). A significant correlation founded between carbohydrate with leg power and arm power. No correlation founded between protein and fat with leg power and arm power.

**Keywords:** pencak silat, leg power, arm power, carbohydrate, fat, protein

## **INTRODUCTION**

Pencak Silat is an Indonesian martial art which has been recognized worldwide and competed in various international sports competitions, such as the SEA Games. As the owner, Indonesian achievement in SEA Games 2009 is unsatisfactory with just two gold medal.

The caused factor can be derived from the athletes themselves or from the surrounding environment. Lack of exercise, mental, nutritional status, interest and willingness can be an obstacle to the achievement of an athlete. In addition, the lack of appropriate environmental support, both material and morale can also be a hindrance. Adequate nutrition in the world-class athletes can lead to differences in performance with the assumption that other factors are also fulfilled. Nutrients provide some effect on athletes. At a basic level, good nutrition has an important role to maintain health and make athletes can trained and competed [1].

Inappropriate nutritional approach can affect athlete's achievement. Giving good nutritional status, required to maintain health and support the achievement of coaching athletes. In Yogyakarta, adequate intake for athletes of pencak silat is less attention. Therefore, we need a further study to determine the adequacy of energy on pencak silat

DIY athletes. When the nutritional status of pencak silat athletes have been known since the beginning, training course that will be undertaken in the future can be determined correctly, so optimized an athlete's potential and talent, and in the end were able to create athletes with a good achievement.

## RESEARCH METHOD

This study is an observational study with cross sectional approach. The research was conducted in September-October DIY in 2012. Subjects were a total population of pencak silat tanding athletes pelatda DIY totaling 15 people participated to follow the study inclusion criteria and signed informed consent after receiving an explanation of the research procedures, listed as pencak silat tanding athlete pelatda DIY, ever represent DIY to the national level, has been practicing minimum two years of martial arts. Exclusion criteria included injured so could not did the physical fitness test and exercise inactivity > one month .

The variables in this study consists of independent variables, that are the fulfillment of carbohydrates, fats, and proteins and dependent variable, arm power and leg power. Fulfillment of carbohydrate, protein, and fat intake is the average amount of carbohydrate, protein, and fat in a day as measured using 24-hour food recall method for 3 days not consecutive. Then classified by the criteria of WNPG less when < 80 % of the requirement, enough around 80-110 % of the requirement, excessive if > 110 % of the requirement. Arm power is a combination of physical components of arm strength and speed which measured using a medicine ball test. Leg power is a combination of physical components of leg strength and speed which measured using the standing broad jump.

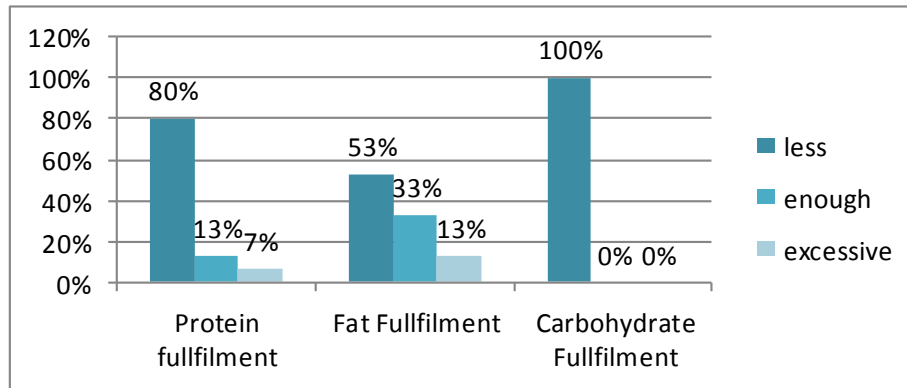
Data processing used Excel computer program, Nutrisurvey and SPSS 17. Data were analyzed quantitatively covering univariate and bivariate analysis. Univariate analysis to get an idea of the frequency distribution of protein, fat and carbohydrate intake as well as arm power and leg power. Bivariate analysis is used to examined the correlation of independent variables and dependent variables. In the bivariate analysis used Pearson correlation test.

## RESEARCH RESULT AND DISCUSSION

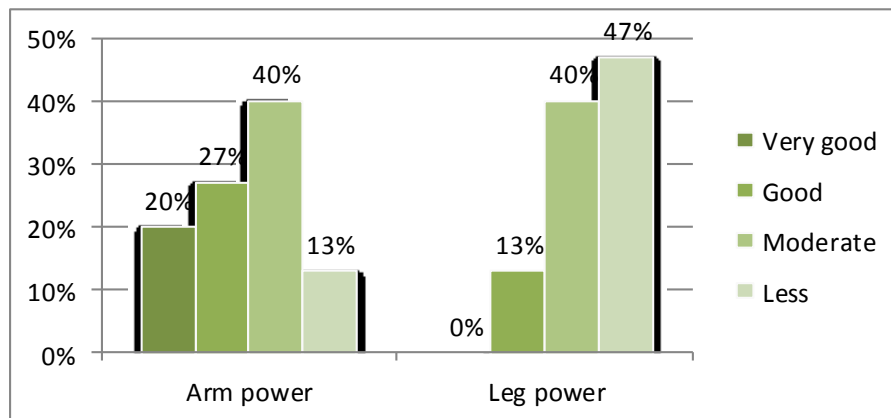
The subject for this study is 15 members of pencak silat combative athlete, 8 person (53,3%) men and 7 person (46,7%) woman. The subject age is between 18-23 years old. About 73,3% subject trained 4-6 times a week and the rest (26,7%) trained < 4 times a week. Subject characteristic showed in table 1.

Table 1. Subject characteristic

No	Characteristic	Amount (n)	Percentage (%)
1	Gender		
	Men	8	53,3
	Woman	7	46,7
	Total	15	100
2	Age		
	18-23 y.	15	100
	Total	15	100
3	Training Frequency in a week		
	< 4 time	4	26,7
	4-6 time	11	73,3
	Total	15	100



**Figure 1. Fulfillment nutrient intake**



**Figure 2. Leg power and arm power profile**

**Table 2. correlation between protein, fat and carbohydrate with leg power and arm power**

	p value	Correlation (R)
Protein and arm power	0,651	0,127
Protein and leg power	0,894	0,038
Fat and arm power	0,572	0,159
Fat and leg power	0,723	0,100
Carbohydrate and arm power	0,005	0,678
Carbohydrate and leg power	0,023	0,581

### **Fullfilment Intake**

The most important component in the exercise and performance is ensure sufficient intake of calories to support energy expenditure and maintain strength, endurance, muscle mass and overall health [2]. The main energy source in various levels and types of physical activity derived from carbohydrates, fats, and proteins that

serves to maintain the functional activity of the body. To determine the required amount of energy a day in an athlete using the formula factor activity x (BMR + SDA) + Energy to workout a day. The fulfillment nutrient intakes are presented in figure 1.

The majority of respondents (80%) deficient intake of protein, while the rest is enough (13%) and excessive (7%). These results differ from the results in Bali, where 92.3% respondents have excessive protein intake, and only 7.7% is sufficient intake [3].

Adequacy of proteins is influenced by body weight, age and quality of protein consumed [4]. Sports that rely on strength/power need higher protein than endurance sports, especially at the initiation stage during rehearsal or a sharp increase in training volume [5] Recommended for sports that rely on power or strength requires 1.6 to 2 g/kg/day of protein, although some studies suggest that protein requirements may be decreased during biological adaptation that increases the retention of the protein [6].

Fulfillment of fat in this study showed, 53% of respondents categorized as less, 33% enough, and 13% excessive. Deficiency of fat intake may interfere with the absorption of fat-soluble vitamins such as vitamins A, D, E, and K. While excessive consumption of fat in athletes can increase triglycerides, total cholesterol, LDL cholesterol and body fat. Excessive body fat for an athlete will affect the speed, power and sports performance. In addition it will lead to slows gastric emptying, and stomach full thus making inadequate carbohydrate intake.

Meeting the needs of carbohydrate on the study's respondents 100% of respondents were in the category of deficient intake of carbohydrates. This result differs from that obtained in Bali, 57.7% of respondents have sufficient carbohydrate intake, 38.5% less and 3.8% excess carbohydrate intake [3].

Deficiency of carbohydrate intake can lead to dietary ketosis. Ketones in the body has an effect on insulin and glucagon secretion. Moreover ketones also have a direct effect in inhibiting lipolysis in adipose tissue [7].

Inadequate intake of energy, protein, fat and carbohydrates respondents in the study may be caused by various factors. In elite athletes consume enough food on a regular basis without compromising the performance is a challenge, especially for student athletes/students affected by school schedules, costs, cafeteria menus, mileage and appetite change thus making the situation becomes more complex [2].

Another factor that could also be the caused of the lack intake is because pencak silat is a sport that is based on weight categories such as taekwondo and karate. Because of these categories, many athletes choose the method of rapid weight loss (more than 5% in a week) to be able to compete against athletes who are smaller and weaker. Judo athletes often use fluid restriction and carbohydrate intake. Before competition, judo and karate athlete are also very limiting fat intake. There is the same character matches allow this also occurs in pencak silat combative athlete [8].

### **Arm Power and Leg Power Profile**

Power is the ability of muscles to use the maximum strength in a very fast time [9]. In tanding category of pencak silat, athletes require maximum strength in the shortest possible time to attack and defend. This is an ability that the system works based on anaerobic energy supply without depending on O<sub>2</sub>, only for a few seconds and the combustion energy produced lactic acid. The result of arm power and leg power Pencak Silat Tanding DIY athlete showed in figure 2.

The survey results revealed that most of the power arm of the respondents were in the moderate category. While the rest of the category is less, good and also very good.



Then for leg power, majority of respondents are in the less category and the rest was moderate and good.

This results indicate that the ability of a power athlete in this study is not maximized. As an elite athlete, they should have a maximum capacity so can produced maximum achievement. Less maximum power generated by the respondents in this study may be caused due to the intake into the body is still insufficient. This can be seen in Figure 1 where it appears that all macro- nutrient intake are in the poor category.

In a study of female taekwondo athlete, saying that the greatest weight in differentiating successful and less successful athletes can be attributed to alactic anaerobic power, agility and explosive power [10]. In addition , it can be concluded that the performance of female taekwondo athletes depend on anaerobic and aerobic power, explosive power as indicated by the short range of movement and agility. Because pencak silat, karate and taekwondo have a similar movement and energy systems, relevant fitness components for taekwondo and karate are also important for the performance of pencak silat athletes .

### **Correlation Between The Fulfillment Of Protein and Power( Arms And Legs )**

Protein is one of the macro nutrients that are important in the formation of biomolecules. In an athletes, protein can also be used as an energy source in aerobic exercise, especially when the time of exercise is longer. An athlete requires 2-3 portion more than normal people .

Based on the correlation test, there is no correlation between protein with a power arm and leg power. Arm power and protein p value is 0.651. As for protein and leg power p-value is 0.894 (table 2).

This result can be caused the protein is used as an energy source in aerobic activity, whereas power is an anaerobic activity. Higher protein intake of recommendation does not provide changes in strength and body composition in students athletes who rely on strength or power [11]. In athletes, adequate protein intake is necessary to reduce the risk of damage to the muscle tissue as an effect of hard training .

Intake of protein and certain amino acids can counteract the effects of overtraining and poor performance [12]. The addition of protein in moderate carbohydrate foods was reported to increase the synthesized of glycogen and improve exercise performance quickly after first training, compared with only a moderate carbohydrate diet .

High protein intake is known to stimulate metabolic acidosis due to acid residue protein. Metabolic acidosis induced by a high protein intake will increase urinary excretion of acid and also increases urinary calcium and phosphate levels, which may have a negative effect on bone and muscle protein metabolism [13].

### **Correlation Between the Fulfillment of Fat with Power ( Arm And Legs )**

Fat is one of the macro nutrients that serve as a second source of energy after carbohydrates . Medium chain triglyceride is the most easily fat form to absorbed and distributed to the muscle cells, when consumed in a reasonable amount during exercise it could increase the supply of glycogen fuel and improve the performance of athletes [14].

Fatty acid deficiency of food can cause reproductive failure and disorders of the skin, kidneys, and liver [15]. This fat contributes 50-70 % of energy needs during mild to moderate exercise. Stored fat (intramuscular and adipose derived) becomes very important for the long -term exercise [16].

Based on the test, there is no correlation between fat with arm power and leg power. For fat and arm power p-value is 0.572. As for fat and leg power p-value is 0.723(table 2).

This result possibly caused the power is an activity that relies on anaerobic energy expenditure. While fat is a source of energy that requires oxygen in large quantities, so that only an aerobic activity that can utilize fat as an energy source .

Fat could be oxidized as an energy source composed of triglycerides, free fatty acids and intramuscular triglycerides. Increased levels of free fatty acids in the blood and used by the muscles can reduce the use of glycogen and blood glucose. Fatty acid levels usually peak after 2-4 hours of moderate exercise [17] .

### **Correlation Between Fulfillment of Carbohydrates and Power ( Arms And Legs )**

Carbohydrates are the main energy source in the body. Carbohydrate is not stored in large quantities and it is important for muscle contraction, so intake should be obtained every day .

When compared with fats and proteins, carbohydrates are more favorable in high-intensity anaerobic exercise because it produces energy ( ATP ) rapidly through the oxidative process. In anaerobic exercise, carbohydrates being the only macronutrient that produce ATP [16].

Based on the correlation test (table 2), carbohydrates with a power arm and leg power have a significant correlation. Arm power and the carbohydrate p-value is 0.005 (  $p < 0.05$  ) and a correlation coefficient 0.673. As for carbohydrates and leg power p-value is 0.015 (  $p < 0.15$  ) and a correlation coefficient 0.614. These results demonstrate strong correlation with the positive pattern, which means the higher carbohydrate fulfillment the higher power arm and leg power generated.

This significant correlation is because the main source of energy in anaerobic activity is ATP that derived from muscle glycogen from carbohydrates store. Carbohydrate deficiency intake can quickly deplete muscle and liver glycogen stores. This would affected in total exercise capacity and capacity to support high-intensity resistance training [16]. The effects of various types of carbohydrate intake on muscle glycogen concentration showed that there is a significant correlation between the amount of carbohydrate ingested and the amount of glycogen synthesis during 24 hours after exercise that resulted in the emptying of glycogen [18]. Because carbohydrates is the main source of energy during high intensity exercise and body glycogen stores are limited, most of the increase in energy associated with exercise should come from carbohydrates [19].

Carbohydrates are the basic source of energy that enables muscles to keep working. Approximately 80% of the body's energy comes from carbohydrates [20]. In the body, carbohydrates are metabolized and stored as glycogen. Carbohydrates are important for muscle contraction and is not stored in large amounts, so intake should be obtained every day with complex carbohydrates and fruit. "Diets performance" recommended for active people and athletes require up to 45% of the intake of ordinary people [21].

As a major energy source in combat sports, such as pencak silat, restriction carbohydrate intake will greatly affected the athlete condition. Carbohydrate restriction left athletes fighters unprepared to compete. The ability to apply the techniques quickly and efficiently is important to get a good performance [22].

The main energy source of ATP production during exercise is carbohydrates and fat. When doing mild exercise (25%  $\text{VO}_2$  max), approximately 20% of the total energy expended taken from carbohydrates, while the rest is taken from fat.

## CONCLUSION AND SUGGESTION

In this study, it can be concluded that there is a correlation between carbohydrate fulfillment with arm power and leg power. This result caused carbohydrates are the main energy source in anaerobic activity where pencak silat is sport with predominantly anaerobic energy system. While no correlation was founded between protein and fat with the arm power and leg power.

To get a better power, a combination of a good intake and proper exercise will increase power athlete so the athlete is able to achieve maximum performance.

## ACKNOWLEDGMENT

This research was funded by the Lecturer Student Collaboration Grant with funded by grants BOPTN LPPM and Nutrition Lecturer Grant of Medical Faculty UGM. This research was made possible through the support of Regional Board Indonesian Pencak Silat Association Special Region of Yogyakarta (PENGDA IPSI DIY); Mr. Awan Hariono, M.Or; Pencak Silat Student Activity Unit, State University of Yogyakarta; and the Sport and Performance Laboratory Faculty of Sports Science, Sport Faculty Yogyakarta State University.

## REFERENCES

1. Granjean, Ann, C. 1989. *Macronutrient intake of US athletes compared with the general population and recommendations made for athletes*. American Journal Clinical Nutrition. 49:1070-176.
2. Dorfman, Lisa MS, RD, CSSD, LMHC. 2008. *Nutrition for Exercise and Sport Performance*. In Mahan, L.K and Stump, S. E. 2008. Krause's Food and Nutrition Theraphy 12<sup>th</sup> edition. USA: Elseviere pp 588-590.
3. Widiastuti, Putu Ayu. 2008. *Dukungan Pola Makan terhadap Latihan Fisik Pencak Silat Pelatihan Daerah Olahraga Nasional 2008 Propinsi Bali*. Tesis, Universitas Gadjah Mada.
4. Widyakarya Nasional Pangan dan Gizi (WNPG). 2004. Jakarta: Lembaga Ilmu Pengetahuan Indonesia.
5. Campbell B., Bill Kreider, Richard B, Ziegenfuss, Tim Bounty, Paul La Roberts, Mike Burke, Darren Landis, Jamie Lopez, Hector Antonio, Jose. 2007. *International Society of Sports Nutrition position stand : protein and exercise*. Journal of the International Society of Sports Nutrition, 4:8
6. Rennie MJ, Tipton KD: *Protein and amino acid metabolism during and after exercise and the effects of nutrition*. Annu Rev Nutr 2000, 20:457-483.
7. Manninen, Anssi H. 2004. *Metabolic Effects Of The Very-Low-Carbohydrate Diets : Misunderstood " Villains " Of Human Metabolism*. Journal of the International Society of Sports Nutrition. 1:7-11.
8. Brito, Ciro Jose, Aendria Fernanda Castro Martins Roas, Igor Surian Souza Brito, João Carlos Bouzas Marins, Claudio Córdova, and Emerson Franchini. 2012. *Methods of Body-Mass Reduction by Combat Sport Athletes*. Journal of the International Society of Sports Nutrition. 22:89-97.

9. Harsono. 1988. *Coaching dan Aspek-Aspek Psikologis Dalam Coaching*. Jakarta: Depdiknas Dikti LPTK.
10. Markovi Goran, Marjeta Misigoj-Durakovic, Slavko Trninic. 2005. *Fitness Profile of Elite Croatian Female Taekwondo Athletes*. Coll. Antropol. 29: 93–99.
11. Hoffman Jay R., Nicholas A. Ratamess, Jie Kang, Michael J. Falvo, Avery D. Faigenbaum. 2006. *Effect of Protein Intake on Strength , Body Composition and Endocrine Changes in Strength / Power Athletes*. Journal of the International Society of Sports Nutrition. 3:12-18.
12. Lowery, Lonnie dan Cassandra E Forsythe. 2006. *Protein and Overtraining : Potential Applications for Free-Living Athletes*. Journal of the International Society of Sports Nutrition. 3: 42–50.
13. Kim, Hyerang, Saningun Lee dan Ryowon Choue. 2011. *Metabolic responses to high protein diet in Korean elite bodybuilders with high-intensity resistance exercise*. Journal of the International Society of Sports Nutrition. 8:10.
14. Caitlin. 2008. *Fact Sheet : Fat – does It Help Performance?* [Internet]. Diakses dari <http://www.sportsdietitians.com.au> [pada tanggal 27 Juni 2012]
15. Almatsier, S. 2004. *Prinsip Dasar Ilmu Gizi*. Jakarta : PT Gramedia Pustaka Utama.
16. McArdle, W., Katch, F.I., Katch, V.L. 2007. *Exercise Physiology*. USA. Lippincott Williams and Wilkins.
17. Primana, D.A. 2000. *Penggunaan Lemak Dalam Olahraga*. Pedoman Pelatihan Gizi Olahraga Untuk Prestasi. Jakarta. Direktorat Gizi Masyarakat.
18. Sherman, William M, J Andrew Doyle, David R Lamb, Richard H Strauss. 1993. *Dietary carbohydrate, performance during muscle glycogen , 7 d of training*. American Journal Clinical Nutrition. 57: 23-31.
19. Beals, Katherine A. 2001. *Nutritional Concerns of Adolescent Athletes*. In Nutritional Applicant in Exercise an Sport. New York : CRC Press.
20. Irianto, D.P. 2006. *Panduan Gizi Lengkap Keluarga dan Olahragawan*. Ed 1. Yogyakarta. Penerbit Andi.
21. Sharkey, Brian J. 2003. *Kebugaran dan Kesehatan*. Jakarta: PT Raja Grafindo Persada.
22. Artioli, Guilherme G, Emerson Franchini, Humberto Nicastró, Stanislaw Sterkowicz, Marina Y Solis dan Antonio H Lancha Junior. 2010. *The need of a weight management control program in judo : a proposal based on the successful case of wrestling*. Journal of the International Society of Sports Nutrition. 7:1–5

# COMPARASION OF BODY COMPOSITION AND SOMATOTYPE CHARACTERISTICS OF SPRINTER ATHLETES AT AUE AND YSU

Eddy Purnomo<sup>1</sup>, Norikatsu Kasuga<sup>2</sup>, Hideki Suzuki<sup>3</sup>

<sup>1</sup>Yogyakarta State University, Indonesia; <sup>2,3</sup>AICHI University of Education, Japan.

## Abstract

In an effort to describe the physique and body composition associated with performance of University level sprinter athletes of AUE and YSU. This study was conducted on 12 sprinter athletes from AUE and 8 sprinter athletes from YSU. Sprinter athletes from AUE on average are 20 years old, 171.6 cm tall and weigh 62.01 kg; sprinter athletes from YSU on average are 20.57 years old, 168.87 cm tall, and weigh 61.62 kg. Besides height and weight, six skinfolds (triceps, midaxilla, subscapular, abdomen, suprailiac and calf), two bicondylar breadths (humerus and femur) and two girths (biceps and calf) were measured. Somatotype evaluations were made according to the Heath & Carter method. Body fat percentage was assessed using the equation prescribed by Berzerk et al. (1963). BMI was calculated as body mass divided by height squared (kg/m<sup>2</sup>). The somatochart indicated that sprinters at AUE and YSU are ectomorphic mesomorphs. The body fat percentage at AUE is (10,9 ± 2,8%) and at YSU is (10,34 ± 1,7) This was reflected in their endomorphic components which is lowest in sprinter athletes at AUE (2,47±0,59) and YSU (2,39±0,41). Mesomorphy component sprinter athletes at AUE is (3,77±1,22), which is lower than the sprinter athletes at YSU (4.85±0,67) , but the ectomorphic components sprinter athletes at AUE is (3,11±1,04), which is higher than sprinter athletes at YSU (2,79±0,45). This means that sprinter athletes at YSU are more muscled than at AUE. Compared to their overseas counterparts, the sprinter athletes of both track and field events in the present study exhibited greater mesomorphic values. The present data will serve as a reference standard for the anthropometry and body composition of sprinter athletes at AUE and YSU.

**Keywords:** body composition, somatotype, endomorphic, mesomorphic, ectomorphic, anthropometric

## INTRODUCTION

The measurement and apprehension of the basic morphological characteristics of athletes is the foundation on which a training process may be built. Specific anthropometric characteristics are needed to be successful in certain sporting events. It is also important to note that there are some differences in body structure and composition of sports persons involved in individual and team sports. The tasks in some events, such as sprinting, are quite specific and different from each other and so are the successful physiques. This process where by the physical demands of a sport lead to selection of body types best suited to that sport is known as "Morphological Optimisation".<sup>9,10,12</sup> Running events in track-and-field are marked by an exceptional variety of duration of a single event, energetic demands and the tempo of energy release. The fact that runners need to carry their body weight, which means they need to overcome the force of gravity on different distances, stipulates a specific (lean) body composition as a prerequisite for more efficient and economic performance in a single event.<sup>1,2,4,6</sup> Athletes who have or acquired the optimal physique for a particular event are more likely to succeed than those who lack the general characteristics.<sup>3,4,5,6</sup> Studies on somatotype of athletes, elite athletes and Olympic athletes have generally shown that strength and speed dependent athletes tended to be basically mesomorphic while distance dependant athletes were found to be more ectomorphic with limited amount of mesomorphic muscularity.<sup>17,18,19</sup>

A somatotype is a description of present morphological confirmation. It is expressed in ratings consisting of three sequential numbers always recorded in the same order. Each number represents evaluation of one of the three primary components of physique, which describe individual variation in human morphology and composition. Endomorphy, or the first component, refers to relative fatness and leanness of the physique; mesomorphy, or the second component, refers to musculo-skeletal development relative to height; and ectomorphy, or the third component, refers to the relative linearity of individual physique.<sup>4,7,8</sup>

In athletes, body composition measures are widely used to prescribe desirable body weights, to optimize competitive performance and to assess the effects of training.<sup>7,15,16</sup> It is generally accepted that a lower relative body fat is desirable for successful competition in most of the sports. This is because additional body fat adds to the weight of the body without contributing to its force production or energy producing capabilities, which means a decrease in relative strength. It is obvious that an increased fat weight will be detrimental in sporting activities where the body is moved against gravity (e.g. high jump, pole vault, volleyball spiking action) or propelled horizontally (e.g. running).<sup>11,13</sup> In running at any sub maximal speed, the oxygen requirement is increased with any increment in body weight, that is, oxygen consumption is increased due to the greater energy demand required to initiate and sustain movement of a larger weight.<sup>16</sup> Previous research has demonstrated that athletes in all running events have less body fat compared to most other disciplines.<sup>7,14</sup>

Despite concern about the fact that morphological parameters are an essential part of the evaluation and selection of sports persons for diverse fields of sports, standard data on such parameters are still lacking in the Indonesian context in track and field athletic events. The present study was therefore aimed at evaluating the physical parameters, anthropometric measurements, body composition and somatotype of male track and field athletes from YSU, and to compare the data with their AUE.

## RESEARCH METHOD

### Subjects

Twenty sprinter athletes from both universities, consists of twelve sprinter athletes from AUE and 8 from YSU. All the sprinter athletes enrolled in the athletic sports organization of each college, the average old sprinter athletes have nineteen to twenty-one years old and following exercise at least 3 times per week, and have physical healthy, and once represented the university in sports competition in his country. And all subject and coaches gave written informed consent to participate

### Procedures

Twelve morphological body measures were taken: height, weight, breadth of femur and humerus, girths of upper arm and lower leg on the right side, skinfolds of triceps, supra-iliac, sub-scapular, chest, abdomen and calf. The height was measured by means of stadiometry to the nearest 0.5 cm and a bathroom scale was used to measure body mass to the nearest 0.1 kg. Skinfold measurements were taken using Lafayette Skin-fold caliper (U.S.A) with constant tension. Vernier Caliper was used for assessing breadths and steel measuring tape used for measuring circumferences. Guidelines of Johnson and Nelson (1982) were followed for these measurements. Body composition (percentage of lean body mass and body fat), body mass index and body somatotype (according to Heath-Carter, 1984) were calculated from anthropometric measures using the following equations.

Body Density or BD (gm/cc)

$$= 1,089733 - 0,0009245(\sum ABC) + 0,0000025(\sum ABC)^2 - 0,000079 \times \text{age}$$

Where: (A) = triceps Skinfold

(B) = Suprailliac skinfold and

(C) = Abdomen (larry G.Shaver 1982)

$$\text{Percent of Body Fat or PBF (Berzerk et al., 1963)} = (4,570/BD - 4,142) \times 100$$

$$\text{Lean Body Weight or LBW (kg)} = (\text{Total Body Weight} - \text{Total Weight of Fat})$$

$$\text{Total Weight of Fat} = (\text{Weight} \times \text{percent of fat})/100$$

BMI (Kg/m<sup>2</sup>) = (Body mass in Kg) / (Stature in Meters)<sup>2</sup>, (Meltzer et al., 1988)  
 Ideal Body Mass = (Height -100)- 10%(Height-100)  
 Lean Body Mass = 100%-TWF%

### Statistical Analysis

Considering the purpose of the study mean and standard deviation were computed for the statistical treatment of the data. The obtained data was treated with analysis of independent t-test for finding out the difference between groups when the obtained t ratio found to be significant at 0.05 level.

## RESEARCH RESULTS AND DISCUSSION

### Results

Based on Table 1, we can conclude that physical and anthropometric parameters between athlete sprinters at AUE and YSU occur. Almost all the parameters are very significant differences except in weight, BMI and calf circumference. While the ideal height and body mass for sprinters at AUE is higher than at YSU, sprinters at YSU have humerus and femur components larger than sprinters at AUE. The circumference of biceps at YSU are also greater than sprinters at AUE.

**Table-1. Varius physical parameters and athropometric characters of the sprinters.**

Variables	AUE	YSU	t	p=0,05
Age (yrs)	20±1,2	20,6±1,1	2,727	p < 0,05**
Height (cm)	172,3±5,4	168,9±3,3	3,478	p < 0,05 ***
Weight (kg)	62±2,7	61,6±4,8	0,530	p > 0,05
BMI(kg/m <sup>2</sup> )	21,2±1,6	21,6±1,1	1,356	p > 0,05
Ideal body mass	64,05±4,49	61,9±2,75	3,864	p < 0,05***
B.Humerus (cm)	6,7±0,3	7,8±0,3	17,742	p < 0,05***
B.femur (cm)	9,8±0,5	9,4±0,7	3,287	p < 0,05***
B.Biceps (cm)	25,5±1,7	31,5±2,4	14,423	p < 0,05***
G.Calf (cm)	35,4±4,6	35±1,7	0,508	p > ,05

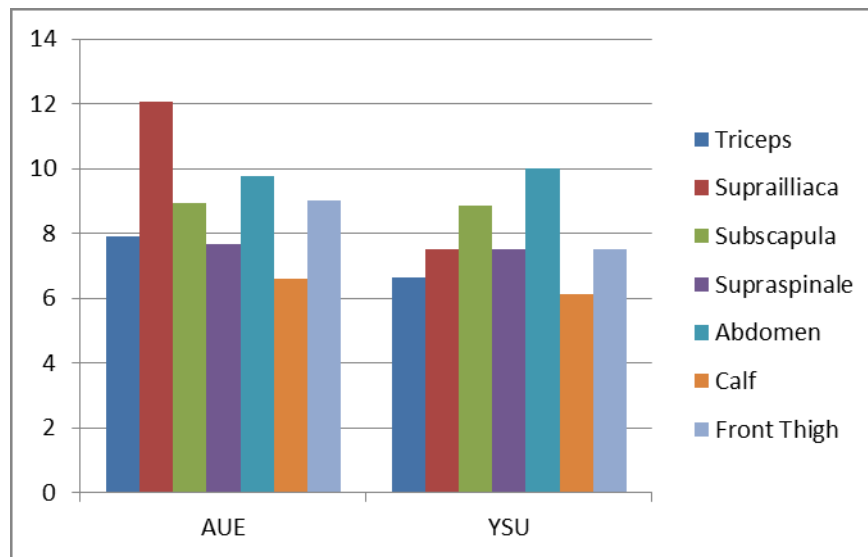
The skinfold measurement results presented in Table 2 show that among athlete sprinters at AUE and YSU there is no significant difference in fat thickness in the components supraspinale, subscapular, abdominal and calf. However, the thickness of fat in the triceps, front thigh and supra-illiaca have a very significant difference, which AUE has greater of than sprinters at YSU.

**Table-2. Different skinfold measurment of the sprinter**

Variables	AUE	YSU	t	p
Triceps (mm)	7,92±2,11	6,62±1,85	3,102	p<0,05***
Supraspinale (mm)	7,67±2,39	7,5±1,77	0,378	p>0,05
Sub-scapular (mm)	8,92±2,53	8,87±1,36	0,102	p>0,05
Suprailliaca (mm)	12,08±3,85	7,5±1,77	4,958	p<0,05***
Abdomen (mm)	9,75±4,14	10±3,25	0,254	p>0,05
Calf (mm)	6,58±3,39	6,12±1,36	0,641	p>0,05
Front thigh (mm)	9±3,91	7,5±1,31	2,257	P<0,05**

Table 3 summarizes the body composition and somatotype values of the sprinter athletes. There were no significant differences in body composition components between AUE and YSU sprinter athletes, but there are very significant differences in somatotype components, namely the components mesomorphy, where athletes at YSU have a greater value than the AUE athletes, as well as the components ectomorphy where AUE athletes have a higher value than

YSU. All skinfold measurements are illustrated in the graph 1.



**Graph-1. Different skinfold measurments between AUE and YSU**

**Table-3. Values of somatotype and body composition of the sprinter athletes**

Variables	AUE	YSU	t	p =0,05
Body fat (%)	14,52±2,78	14,12±2,12	0,760	p > 0,05
TWF (kg)	9,22±2,39	8,69±1,48	1,225	p > 0,05
LBM (%)	90,78±2,04	91,30±1,48	1,269	p > 0,05
LBW (kg)	54,07±3,80	52,93±4,50	1,344	p > 0,05
Endomorphy	2,47±0,6	2,39±0,42	0,725	p > 0,05
Mesomorphy	3,77±1,22	4,86±0,67	5,098	p < 0,05***
Ectomorphy	3,11±1,04	2,79±0,45	1,790	p < 0,05*

## DISCUSSION

Research on somotype athletes and their suitability with the sport needs to be done to support and improve performance in sports in Indonesia. In addition, it will also simplify the search for talent scouts in every sport. However, until now, research on body composition and somatotype athletes in each sport in Indonesia, especially in athletics, namely sprint, still rare. In it, somatotype is one determinant of success in athletes achievements.

Several other countries in the world have been doing research on somatotype and its relation to performance in sports. One of the results of research conducted at the University of New South Wales in the field of anatomy-anthropometric profile getting the anatomy-somatotype of Australian athletes. Womens basketball athletes somatotype were slightly muscular and the fat had a greater percentage than ectomorphy with a value of the somatotype at 3.7 - 4.0 - 2.9 (endo-mesomorphy).

The same thing is also expressed by Mathur et al. (1985). He reported that somatotype for Nigerian athletes in the sport of badminton is a lower percentage of fat and muscle and a little thinner with somatotype value 2.2 - 3.9 - 2.9 (ecto-mesomorphy). Basketball athletes 1.9 - 5.3 - 3.4 (ecto-mesomorphy) have a lower percentage fat and is a taller compared to the more muscular soccer athlete 2.2 - 5.4 - 2.9 (ecto-mesomorphy). The same was reported by Shafeeq VA, et al (2010) in the results of research on Indian students somatotype athlete sprinters 2,53 - 4.31 to 3.06 (ecto-mesomorphy).

Results of this study reported that for the sprinter AUE students, somatotype value is 2.47 - 3.77 - 3.11 (ecto-mesomorphy) while for YSU student sprinters, somatotype value is 2.39 - 4.86 - 2.79 (ecto -mesomorphy). The value that is a component of somatotype



mesomorphy in sprinters at YSU is higher than at AUE. This means that YSU sprinters are more muscular than sprinters at AUE. Thus, it appears that for a sprinter athlete who requires strength and speed, the somatotype value must be a 4 -5 for mesomorphy and a 3 for ectomorphy value and the value 2 for endomorphy .

Likewise, the components of body composition are not significant differences in value of body fat percentage as a whole, but the value for the triceps skinfold, front thigh and suprailliaca at AUE was higher than at YSU. Furthermore, the value of TWF (Total Weight of Fat), LBM (Lean Body Mass) and LBW (Lean Body Weight) had no significant differences between athlete sprinters AUE and YSU.

## CONCLUSION

The results of the present study indicate that in comparison to sprinters at AUE, YSU athletes have a lower body fat percentage. The analysis showed that sprinter athletes statistically differ in morphological measures, especially in dimensions of body volume and body fat. On the manifest level, only triceps, suprailliaca, and front thigh statistically differ, being significantly higher in sprinters at AUE than YSU.

The lowest value of %body fat was present among sprinters at YSU which are reflected in their lower values of skinfold measurement. It was also evident that in relation to their skeletal dimensions, they tend to be more heavily muscled than AUE and this may be advantageous for them at the start of the race and in the initial stages of acceleration as greater force is created by these muscles. In all groups, the mesomorphic component is highly dominant while the endomorphic component is the least marked. The present data may be considered to serve as a reference standard for the anthropometry and body composition of AUE and YSU sprinter athletes.

## REFERENCES

1. Amatya D L (2009), Comparative study of Somatotype of Nepalese sportsmen. Indian Journal of Sports Science and Physical Education, Vol 7 No.2, 21-26
2. Brozek J, Grande F, Anderson JT and Keys A (1963) Densitometric Analysis of Body Composition: Revision of Some Quantitative Assumptions. Ann New York Acad Sci. 110:113-140
3. Carter, J.E.L. (1984). Physical structure of Olympic Athletes. Part II: Kinanthropometry of Olympic Athletes. Medicine and Sports Science. Karger Basel; New York.
4. Carter J.E.L., B.H.Heath (1990) Somatotyping: Development and application, Cambridge University Press, Cambridge).
5. Chatterjee S, Chatterjee P, Bandyopadhyay A (2006) Skinfold thickness, body fat percentage and body mass index in obese and non-obese Indian boys. Asia Pac J Clin Nutr 15: 232–235
6. Fleck S.J (1983), Body composition of elite American athletes. American Journal of sports Medicine, December 1983 vol. 11 no. 6 398-403.
7. Gore, C.J. (2000). Physiological tests for elite athletes. Champaign, IL. Human Kinetics
8. Jackson, A.S., Pollock, M.L. (1985). Practical Assesment of Body Composition. The Physican and Sports Medicine, 5: 76 – 90

9. John Bloomfield, Peter A. Fricker, Kenneth D. Fitch 1995, Science & Medicine in sports, 1995, ch.1, p 161.
10. Johnson BL, Nelson JK (1982) Practical measurement for evaluation in physical education. Surjeet Publication, Delhi- India, 165–167
11. Larry G. Shaver (1982), Essentials of Exercise Physiology (Surjiet Publication, Kamal Nagar, New Delhi, 194
12. Martin, D.E., Coe, P.E. (1997). Better Training for Distance Runners. Human Kinetics. USA.
13. Matković, Br., Mišigoj-Duraković, M., Matković, B., Janković, S., Ružić, L., Leko, G., Kondrič, M. (2003). Morfological Differences of Elite Croatian Soccer Players According to the Team Position. Coll. Antropol. 27 Suppl.1: 167-174.
14. Meltzer A, Mueller W, Annegers J, Grimes B, Albright D (1988) Weight History and Hypertension. J Clin Epidemiol 41: 867–874
15. Ridder H.D, Monyeki, D., Amusa, L., Toriola, A., Wekesa, M. and Carter L. (2000) Kinanthropometry in African Sports: body composition and somatotype of world class male African middle-distance, long-distance and marathon runners. ISAK Publication, Adelaide, pp:37-52.
16. Sodhi, H.S. (1986). Skinfold Pattern Of Top Indian Athletes and Sportsmen. In modern Perspectives in Physical Education and Sports Sciences. Harnam Publications, New Delhi. pp: 53.
17. Tanner, J. M (1964) : The physique of the Olympic Athletes (Allen & Unwin London
18. Thomas Battinelli, Physique, fitness, and performance, Boca Raton, Fla. : CRC Press, 2000, 18
19. Thorland, William C, Glen O. Johnson, Thomas G. Fagot, Gerald D. Tharp, and Richard W Hammer. Body composition and Somatotype Characteristics of Junior Olympic Athletes. Med.Sci. Sports Exercise, Vol. 13, No. 5, pp. 332-338, 1981.

# **IDENTIFICATION OF MANAGEMENT STANDARDS INFRASTRUCTURE AND FACILITIES MANAGEMENT FENCING ORGANIZATION IN YOGYAKARTA**

**Faidillah Kurniawan**

**Yogyakarta State University, Indonesia  
pay\_anggar@yahoo.co.id**

## **Abstract**

This study aims to determine how well management standards infrastructure and facilities management fencing organization in Yogyakarta Special District Indonesia. This research is descriptive quantitative. This research did not isolate individual or organization into a variable or a hypothesis, but it needs to be looked at as part of something wholeness. On the global, shows that the infrastructure and facilities Management Standards sport fencing contained in the Yogyakarta Special District by ownership status, as many as 373 units (67.45%) belong to the organization, and as many as 180 units (32.55%) belong to the individual. Thus, most of infrastructure and facilities Management Standards sport fencing in Yogyakarta Special District is owned by the organization. When considered in terms of eligibility standards that existing infrastructure and facilities Management, the eligibility status on the infrastructure and facilities Management Standards sport fencing in Yogyakarta Special District is 356 (64.38%) feasible, and as many as 197 (35.63%) is not feasible. The results of this study have implications that can be used as a measure of the state of information in the infrastructure and facilities Management Standards sport fencing in Yogyakarta Special District. It can be used as material information, the results of this study can also be used as a basis for the addition or improvement of infrastructure and facilities Management Standards sport fencing that is in the Yogyakarta Special District.

**Keywords:** management, organization, facilities and infrastructure of fencing

## **INTRODUCTION**

Martial arts of Fencing games is defined as the use of the sword. Prior to the form of fencing, as now, the sword used during the Persian, Greek, Roman and Babylonian. Relief found in Egypt Luxor temple depict scenes of game fencing around 119 century BC. At that time, the game also uses a sword and protective face shield at the end of the blade so as not to harm. The emergence of fencing along with the setback period feudal knights and also the emergence of the bourgeoisie. It is important to increase that fencing really is not a martial art. Matches the beginning of this exercise can be found on the reliefs in the can in Madinet-habu temple in luxor, egypt. (Faidillah Kurniawan, 2010:2). In 1951 was the beginning of the fencing organization in Indonesia with the name IPADI (Ikatan Pendekar Anggar di Indonesia) with Chairman Dr. Singgih and Secretary General Formulation Rukmantoro. In Yogyakarta, fencing is a branch that has not been widely known and known by the public. This is due to the promotion or recognition of the sport of fencing is still lacking. The lack of quantity game also was instrumental in the advancement of the sport of fencing so that the public knows the sport.

Achievement in DI Yogyakarta fencing has shown very rapid progress, especially in recent years. One of the factors contributing to the increase achievement athletes in the sport of fencing is a good training method, other support also came from experts in the field of sports and scientists from various disciplines that make basic training for the better. In addition to progress as above, now has a lot of standing association fencing in Yogyakarta Special Region, where it is the development and achievements in Special Region yogyakarta. Fencing has a

special attraction for the devotees, it is evident from some club or extracurricular in the schools have many students who joined in this sport.

Along with fencing has promote begun among the people in DI Yogyakarta, there are some things that very ironic to be a chore than any manager in the sports clubs in DI Yogyakarta. One of the very basic homework is about training infrastructure and facilities as well as adequate fencing games. It is not limited to a small sphere in association fencing that is at the club, at school and at extracurricular organization committee fencing ranging from board level District/Municipal and regional officials.

## **LITERATURE**

### **The Meaning of Management**

Almost all experts acknowledge management defined is management that deals with collective activity, although revealing how different from each other, such as by Komaruddin (1994 : 1) revealed that the management of an organization's allocation and integration of inputs in the environment through the functions performed which are based on certain norms with the way society produces the required output for the purpose of the organization can be achieved. When starting the design of organizational structure, there are several elements that must be clearly defined in advance. The elements are:

1. Clarity of mandate

All forms of goals, activities, and expected outputs of the component organizations must be clearly defined, and should also have the distinction (differentiation) with others both within a division, branch or department. Activities and outputs of the component organizations should be easily linked to organizational goals. If there is no clear definition and distinction of the components of the organization, it can be said that has not met the structural elements of the mandate clarity (clarity of mandate). The existence of a clear mandate in the structure, would qualify the design of organizational structure resulting in the relationship between vision, mission of the organization are realized in the form of a formal organizational structure.

2. Unity of purpose

The unity of the organization to ensure that all components ranging from the smallest unit to a larger unit (can be seen from the large population size, position, budget,etc.) Has been working to achieve a common goal, and all the components work to achieve performance targets related to the unit greater. That is, the relation between the performance and the relationship has been established with the harmonic components, and a form of support emerged from the smallest unit to the largest unit.

3. Clarity of relationship

In an article in the website page <http://ilmusdm.wordpress.com/2009/05/29/mendisain-struktur-organisasi-organization-design-2/> that describes provide assurance that any relationship that occurs (coordination, information, instruction, consultation) between units of a large organization with units smaller organizations have clarity is both horizontally and vertically. More over, it also gives the relationship how internal organizational units of the stakeholders (other ministries, branches,etc.) and external stakeholders (customers, vendors, suppliers, community).

Robbins (2007 ) defines organizational structure as determining how the work is divided and grouped formally. While the organization is a unit of consciously coordinated social, consisting of two or more people, and the basic function in a relatively continuous in order to achieve a set of common goals. In the context of organizational design, Ivancevich (2008 ) define it as the process of determining the decision to choose alternative framework positions, project work, and the department. Thus, decisions or actions selected will produce an organizational structure.

There are six elements that need to be considered by managers when designing the organizational structure will be. These six elements include:

- 1 . Specialization work is the extent to which tasks in an organization is divided into several separate work
2. Departmentalize is the basis used to group work together
- 3 . Chain of command is the unbroken line of authority that extends from the top of the organization to the bottom of the unit and explain who is responsible to whom. The authority itself is a right inherent in a managerial position to give orders and to expect that these orders obeyed.
- 4 . Range control is the number of subordinates that can be directed by a manager efficiently and effectively
- 5 . Centralization - Decentralization . Centralization is the extent to which the decision making is concentrated at a single point in the organization
- 6 . Formalization is the degree to which jobs within the organization's work is done.

### **Design organization**

#### **1. Simple structures**

Simple structure is a structure that is characterized by low levels of departmentalize, wide span of control, authority centralized in one course, and little formalization. Simple structure of the most widely used by small businesses where the manager and the owner are the same.

The main strength of this simple structure lies in simplicity, which is fast, flexible, inexpensive to manage, and clear accountability. The weakness is inapplicable to large organizations. This is because when applied to large organizations where its low formalization and high sentralisasinya will cause overload the information at the top. Decision-making will be slow because it depends on the person that is the owner and head of the organization.

#### **2. Bureaucratic structure**

Bureaucratic structure is a structure with bureaucratic tasks very regularly achieved through specialization, rules and regulations are very formal, tasks that are grouped into functional departments, centralized authority, narrow span of control, and decision-making to follow the chain of command.

The main strength lies in its ability bureaucracy is running the standardized activities efficiently. Brings together some specificity in functional departments generate economies of scale, minimal duplication in personnel and equipment as well as employees have the opportunity to speak "the same language" among their peers. While the weakness of the bureaucratic structure is redundant in following the rules, there is no room for modification, less innovative and efficient bureaucracy throughout the employee only deal with the problems that have previously been set up with a clear way of completion. That is, when faced with new problems, the structure of the bureaucracy becomes inefficient because of new rules required to solve these problems.

#### **3. Matrix structure**

Matrix structure is a structure that creates dual lines of authority and combines functional and product departmentalize. This structure can be found in advertising agencies, corporate aircraft, research laboratories, hospitals, government agencies, etc.

Departmentalize eg functional strength lies in the union of specialists, which minimizes the amount of required while enabling the collection and sharing of resources specific to the whole production. The disadvantage is the difficult task of coordinating the diverse functional specialists so that their activities are completed on time and on budget. Characteristics of the matrix structure is to break the unity of command concept. Employees who are within the structure of the matrix have two bosses (eg, production managers and functional managers). The main drawback of the matrix structure is often caused confusion which may increase stress because there is role ambiguity as well as to create a conflict .

## **Model organizational structure**

### **1. Mechanistic Model**

Mechanistic form of organization is the existence of mechanistic formalization of high level, high degree of centralization, training or work experience little or not too important, there is a wide span of control and the existence of vertical communication and writing. Mostly mechanistic on the type of organization, there are characterized by formalization and centralization at a moderate level, the existence of trainings formal or mandatory, span of control that are moderate as well as written and verbal communication takes place within the organization.

### **2. Model Organic**

Organic is the formalization of the organization there is a low level, there is a low degree of centralization, as well as the necessary training and experience to perform the job duties. In addition there is a narrow span of control as well as horizontal communication within the organization. Mostly Organic is on the formalization and centralization organization that applied were in moderate level. Also required is a lot of work experience in this organization. There is a span of control is between moderate-to-width horizontal as well as more verbal communication within the organization.

## **Factors causing differences in organizational structure**

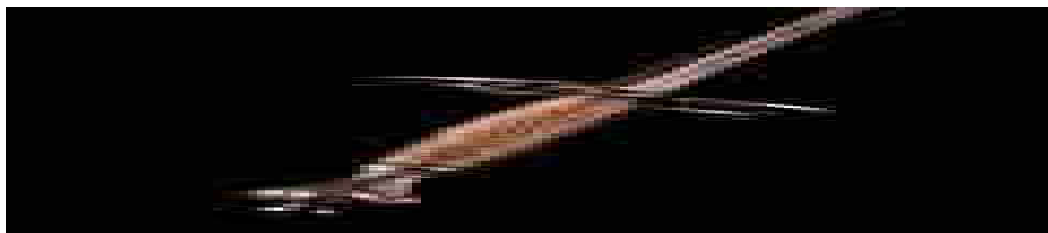
Some things that can lead to differences in the structure of the organization is.

1. Strategies. The organizational structure is one of the means used to achieve management objectives. Because the target is derived from the organization's strategy and structure logical that strategy should be closely linked. More precisely, the structure should follow strategy.
2. Dimensions. Size is the size of an organization that is seen from the number of people within the organization.
3. Technological Organization. Technology is the basis of the subsystem organization of production, including techniques and methods used to transform organizational inputs into outputs.
4. Environment. The environment includes all elements outside the scope of the organization. Key elements include industry, government, customers, suppliers and the financial community.

## **Fencing Sport**

In ancient times before modern weapons, each nation had fencer to defend themselves with parry and attack. Used is any item, whether of wood or iron to deflect when under attack. In Tomb Seragon have found a short sword made of copper supposedly had less than 5000 years old and is a fencing weapon first. Seragon was the first king of the Kingdom of Ancient Mesopotamia around the river Euphrates. According to the old carved about 3000 years ago the Egyptians, Greek, Ancient Chinese proficient in swordplay by a long way .

The previous existence of forms of fencing as it is today, where the sword was used in the mass of Persian, Greek, Roman, and Babylonian. Relief contained in Luxor temple in Egypt describe the scene game fencing around the 19th century BC by using the sword as a tool.



**Figure 1. One ancient form of fencing sword**

The emergence of fencing along with the setback period and also the emergence of feudal knights the bourgeois. It is important to remember that the fencing is really not a martial art. Matches the beginning of this exercise can be found on the reliefs carved in Madinet-habu temple in Luxor, Egypt. The weapons shown on the carved reliefs are blunt weapons, and the fencer to use your mask. The engraving shows the audience, supporting player and a recorder. In medieval times, the sword developed into heavy and odd shaped into a weapon that forces users to deal with armor and mace opponent, is no longer a weapon used to poke the edges. The invention of gun powder has raised the level of war.

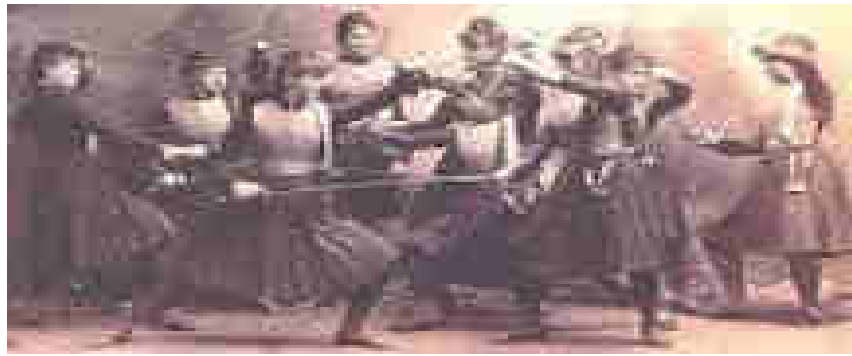
The emergence of fencing along with the setback period and also the emergence of feudal knights the bourgeois. It is important to remember that the fencing is really not a martial art. Matches the beginning of this exercise can be found on the reliefs carved in Madinet-habu temple in Luxor, Egypt. The weapons shown on the carved reliefs are blunt weapons, and the fencer to use your mask. The engraving shows the audience, supporting player and a recorder. In medieval times, the sword developed into heavy and odd shaped into a weapon that forces users to deal with armor and mace opponent, is no longer a weapon used to poke the edges. The invention of gunpowder has raised the level of war.



**Figure 2. Scheme beginning fencing match**

War is no longer carried by armored forces, but also making various forms of protection against an opponent, the sword became the weapon playing, and use sword skills become very important. The sword was later made into lighter so that users can use more quickly. Group of expert fencer growing rapidly in Europe, where sword fights using tools learned and taught. Movement at that time is not always pure battle known as the sport of fencing as today but the elements involved grappling with an opponent. Secrets of the game are taught in different schools and growing rapidly each other through a real battle. After hundreds of years and with a variety of video playback, live very little, and even then if still there. The important thing is the use of time, distance and movement techniques are no longer a surprise like a new game today that can bring victory.

For certain circles anyway at this medieval tool fencing (epee) is used as a weapon to try his strength among the nobility in duel/match between two friends. If anyone feels insulted, then there was a fighting with weapons called epee fencing. It is used for piercing weapons, so that in the battle of death can not be avoided. Someone fighter stay alive in the battle because he won, and that death is defeated. This combat became fashionable among the nobility in the western world at that time. Then the game growing, in case a combat, then someone hit (injured) then the fight was dismissed and he was declared lost.



**Figure 3. Fighting Exercises of women fencer**

Along with the development in swordplay, sword game also uses a protective face shield and also on the tip of the sword in order not to harm others. In addition, there is a person who records the results of matches that have been beautifully depicted in the reliefs. Fencing it stems from a heavy sword with the armor, sword turns into a lightweight and slim, including his clothes, so it is easy how to use it. In fencing match also use your sword as his trademark, the sword as a means to compete. According Faidillah Kurniawan (2010:16) IKASI have a duty and responsibility to nurture and develop the sport of fencing in Indonesia in accordance with government policy and the provisions stipulated by KONI and pay attention to the rules set by the International Fencing Federation (FIE ; Federation Internationale d 'Escrime).

## **RESEARCH METHOD**

This research is descriptive quantitative. This research did not isolate individual or organisasi into variables and hypotheses as well, but need to look at it as part of something wholeness. According Suharsimi Arikunto (2006:142) case study is an intensive study conducted detail and depth to an organization, institution or certain symptoms. This study is a survey method, which used data documentation sheet by observation through the checklist at right judgment on competent experts .

In this study, researchers used data collection techniques by means of direct observation and field data collection by recording all data existing concrete on the ground in the form of documentation of images (photos).

### **1. Observations**

Observation as an asset that is narrow, ie using eye noticed something. In the psychological sense, which is also called observations, covering the activities of loading the object of attention to something by using all the senses. So observing can be done through sight, smell, hearing, touch, and taste bud. What this says is actually direct observation. In the sense that observational studies can be done with the test, questionnaire, recording images, voice recordings. (Suharsini Arikunto, 2006:157).

### **2. Documentation**

Documentation, from the origin of said document, which means the written stuff. In performing the method of documentation, researchers investigated the written objects such as books, magazines, documents, regulations, meeting minutes, diaries, and so on. According Suharsimi Arikunto (2006:158) documentation methods can be implemented with (a) Guidance documentation containing lines or categories of data to be searched, (b) Check -list, ie the list of variables to be collected data. In this case the researchers live gives every appearance of signs or symptoms tally in question. In this study collecting instrument data using a check list observation sheet.



**Table 1 . Listing check list**

Variabel	Factor	Indicator	Description
Facilities and infrastructure at the branch fencing sport in DI Yogyakarta.	1. Equipments 2. Tooling 3. Facilities 4. Conditions 5. Ownership Status	1.organization condition 2.Kondisi infrastructure management real sport of fencing	1.organization name 2.Number of Statistical 3.organization type 4.organization status 5.organization address 6.General condition 7.Total athletes 8. Infrastructure Management condition

The instrument in this study is the observation presented in the form enclosed and filled directly by the researcher with a check (√) in the observation sheet that has been provided, a special column by writing the amount of data existing concrete .

Based on the above, the opinion of this technique is performed to obtain additional data from the observation as a data amplifier, which is a location photo/gym and other facilities.

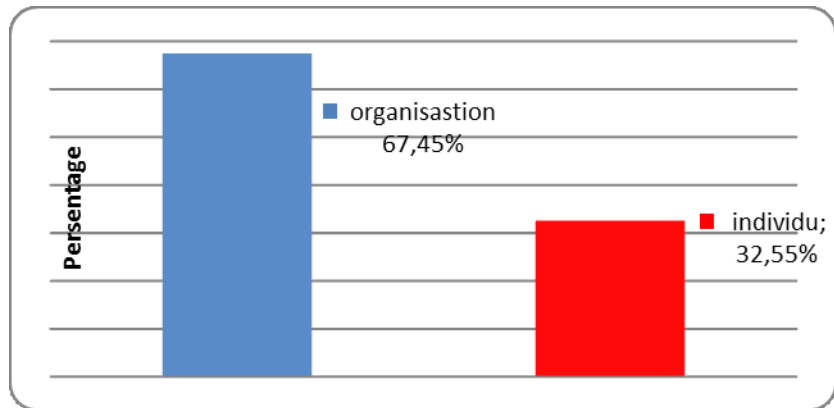
**Table 2. Identification checklist Grid Infrastructure Management Branch Sports Fencing In Yogyakarta**

No	Register of Infrastructure Register of Infrastructure	ownership status		Condition		Total
		Organisation	personal	feasible	no	
1.	Foil					
2.	Sabre					
3.	Epee					
4.	Foil Mask					
5.	Sabre Mask					
6.	Epee Mask					
7.	Piste					
8.	Recording					
9.	Foil Metallic jacket					
10.	Sabre Metallic jacket					
11.	Foil Body Wire					
12.	Sabre Body wire					
13.	Epee Body wire					
14.	Fencing clothes					
15.	Breast protector					
16.	Sabre Glove					
17.	Epee Glove					
18.	Foil Glove					
19.	Fencing Shoes					
20.	Fencing socks					
21.	Rolling cabel					
22.	Epee Practice clothes					
23.	Foil Practice clothes					

## RESEARCH RESULTS AND DISCUSSION

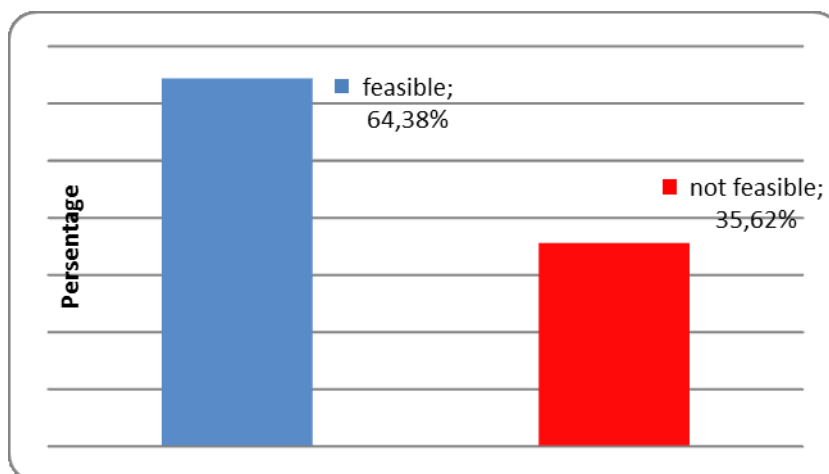
### The overall data description

On the whole, shows that the Infrastructure Management Standards sport fencing contained in the Special Region of Yogyakarta by ownership status, as many as 373 units (67.45%) belong to the organization, and as many as 180 units (32.55%) belong to the individual. Thus, most of Infrastructure Management Standards sport fencing in Yogyakarta Special Region is owned by the organization. Here's a picture diagram.



**Figure 4. Identification of infrastructure management standard fencing organization in Yogyakarta based Ownership Status**

When considered in terms of eligibility standards that existing Infrastructure Management, the eligibility status and Infrastructure Management Standards sport fencing in Yogyakarta is 356 (64.38%) feasible, and as many as 197 (35.63%) is not feasible. Thus, most of the feasibility of Infrastructure Management Standards sport fencing in Yogyakarta Special Region is feasible. The following diagram trunk.

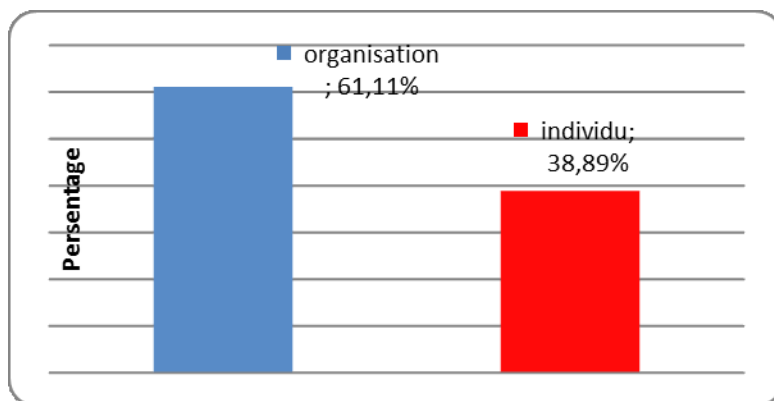


**Figure 5. Identify infrastructure management standard fencing organization in Yogyakarta based on the Feasibility Condition**

#### **Description of data organization**

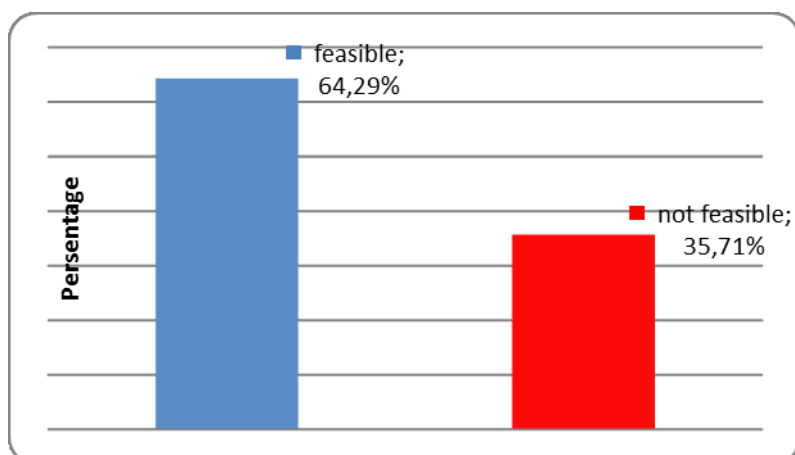
##### **a. PengKab. IKASI Sleman**

PENGKAB IKASI of Sleman, that the results obtained Identification Infrastructure Management Standards sport fencing contained in PENGKAB IKASI SLEMAN by ownership status, as many as 77 units (61.11%) belong to the organization, and as many as 49 units (38.89%) belong to the individual. Thus, most of the identification results of Infrastructure Management Standards sport fencing in Yogyakarta Special Region is owned by the organization. Here's a picture diagram.



**Figure 6. Identification Standard Infrastructure Management Ownership Status Fencing based in PENGKAB IKASI Sleman**

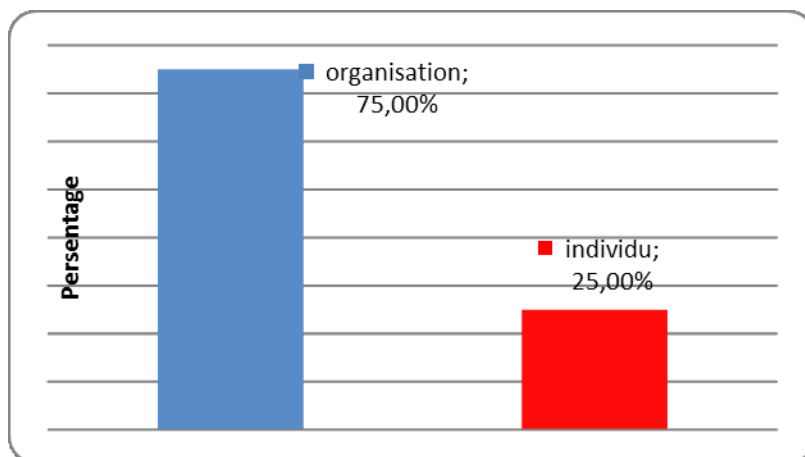
When considered in terms of eligibility standards that existing Infrastructure Management, the eligibility status of Infrastructure Management Standards sport fencing in PENGKAB IKASI Sleman are as many as 81 (64.29%) feasible, and as many as 45 (35.71%) is not feasible. Thus, most of the conditions of eligibility of Infrastructure Management Standards sport fencing in PENGKAB IKASI Sleman is feasible. The following diagram trunk.



**Figure 7. Identification Standard Infrastructure Management Fencing in Sleman based PENGKAB IKASI Eligibility Conditions**

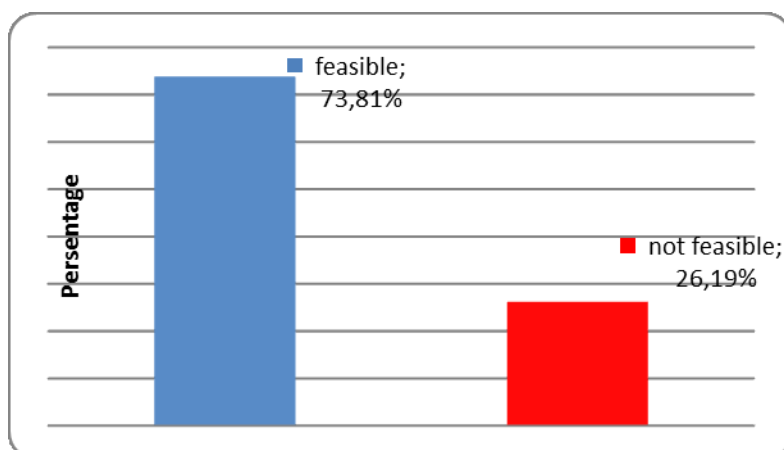
b. PENGKOT. IKASI Yogyakarta

PENGKOT IKASI of Yogyakarta, found that identification results of Infrastructure Management Standards sport fencing contained in PENGKOT IKASI Yogyakarta based on ownership status, as many as 126 units (75%) belong to the organization, and as many as 42 units (25%) belong to the individual. Thus, most of Infrastructure Management Standards sport fencing in PENGKOT IKASI Yogyakarta is owned by the organization. Here's a picture diagram below.



**Fig 8. Identification Standard Infrastructure Management Ownership Status Fencing based in PENGKOT IKASI Yogyakarta**

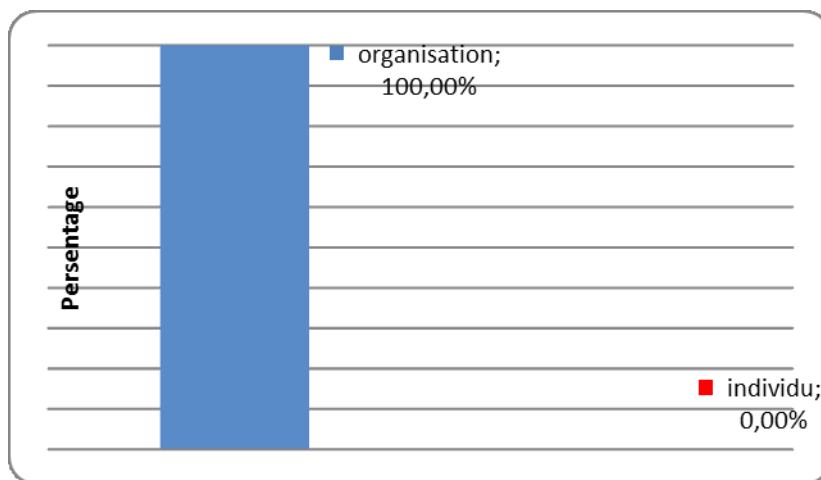
When considered in terms of eligibility standards that existing Infrastructure Management, the eligibility status of Infrastructure Management Standards sport fencing IKASI PENGKOT based on data in Yogyakarta are as many as 124 (73.81%) feasible, and as many as 44 (26.19%) did not feasible. Thus, most of the conditions of eligibility of Infrastructure Management Standards sport fencing in PENGKOT IKASI Yogyakarta is feasible. The following diagram trunk.



**Fig 9. Identification Fencing Infrastructure Management Standards based on the Feasibility Condition PENGKOT IKASI Yogyakarta**

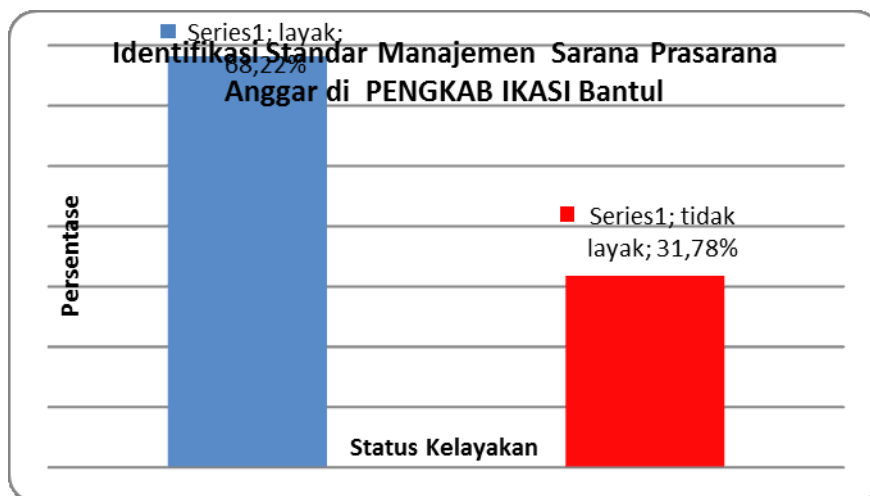
c. PengKab. IKASI Bantul

PENGKAB IKASI of Bantul, that the results obtained Identification Infrastructure Management Standards sport of fencing based on ownership status, as many as 107 pieces (100%) belong to the organization, and as much fruit 0 (0%) belong to the individual. Thus, the overall results of identification of Infrastructure Management Standards sport fencing in PENGKAB IKASI Bantul belong to the organization. Here's a picture diagram below.



**Figure 10. Identification Standard Infrastructure Management Ownership Status Fencing based in PENGKAB IKASI Bantul**

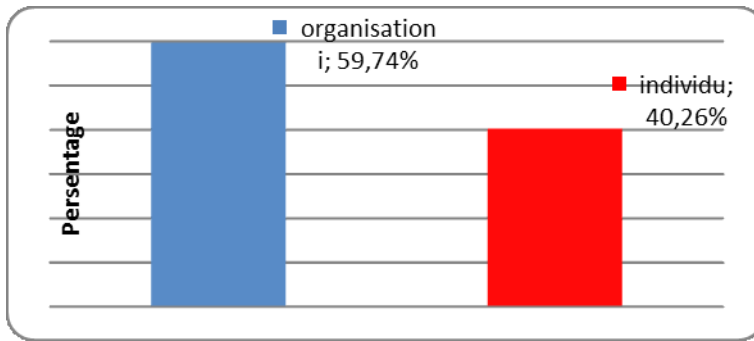
When considered in terms of the feasibility of identification results that Infrastructure Management Standards exist, then the eligibility status of sports facilities and infrastructure PENGKAB IKASI Bantul are as many as 73 (68.22%) feasible, and as many as 34 (31.78%) is not feasible. Thus, most of the conditions of eligibility of Infrastructure Management Standards sport fencing in PENGKAB IKASI Bantul is feasible. The following diagram trunk.



**Figure 11. Identification Fencing Infrastructure Management Standards based on the Feasibility Condition PENGKAB IKASI Bantul**

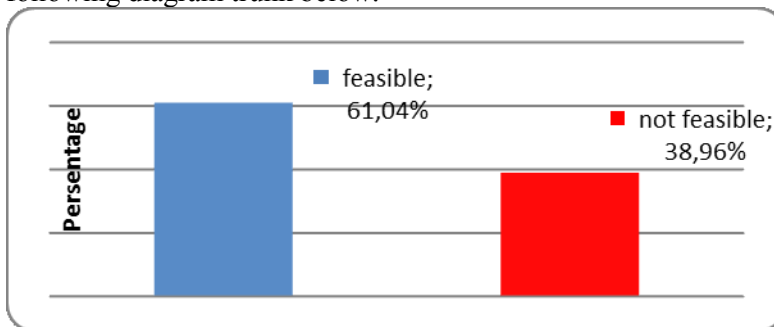
d. PengKab. IKASI Kulon Progo

From the results of the identification of the PENGKAB IKASI Kulon Progo, found that the Infrastructure Management Standards sport fencing PENGKAB IKASI Kulon Progo based on ownership status, as many as 46 units (59.74%) belong to the organization, and as many as 31 units (40.26%) belong to the individual. Thus, most of the identification results of Infrastructure Management Standards sport fencing in PENGKAB IKASI Kulon Progo is owned by the organization. Here's a picture diagram below.



**Figure 12. Identifikasi Fencing Infrastructure Management Standards based on the ownership status PENGKAB IKASI Kulon Progo**

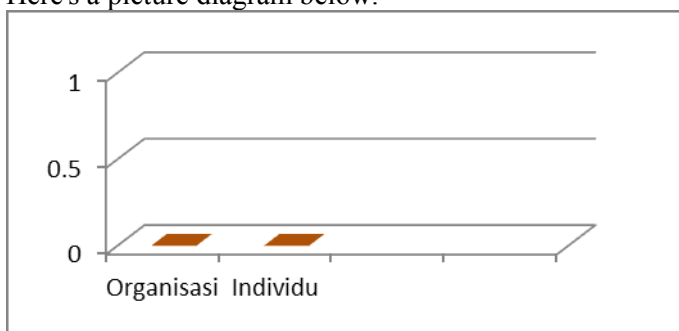
When considered in terms of eligibility standards that existing Infrastructure Management, the eligibility status of Infrastructure Management Standards sport fencing in PENGKAB IKASI Kulon Progo is as much as 47 (61.04%) feasible, and as many as 30 (38.96%) is not feasible. Thus, most of the conditions of eligibility of Infrastructure Management Standards sport fencing in PENGKAB IKASI Kulon Progo is feasible. The following diagram trunk below.



**Figure 13. Identifikasi Fencing Infrastructure Management Standards based on the Feasibility Condition PENGKAB IKASI Kulon Progo**

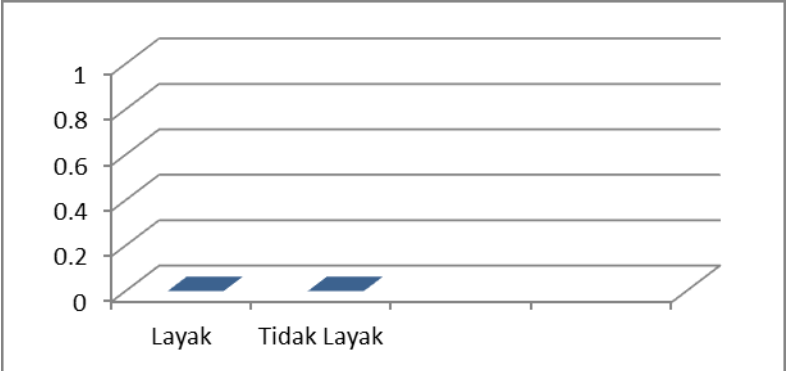
e. PengKab. IKASI Gunung Kidul

From the identification results in PENGKAB IKASI Gunung Kidul, that the results obtained Identification Infrastructure Management Standards sport of fencing by ownership status, as many fruit 0 (0%) belonged to the organization, and as much fruit 0 (0%) belong to the individual. Thus, PENGKAB IKASI Gunung Kidul does not have any infrastructure at all. Here's a picture diagram below.



**Figure 14. Identification Standard Infrastructure Management Ownership Status Fencing based in PENGKAB IKASI Gunung Kidul**

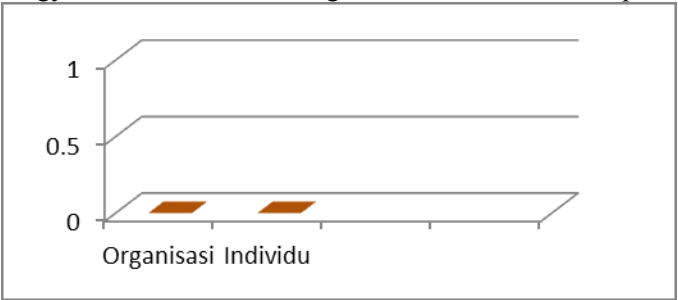
When considered in terms of the identification of eligibility standards that existing Infrastructure Management, the eligibility status of Infrastructure Management Standards sport fencing in PENGKAB IKASI Gunung Kidul as 0 (0%) feasible, and as much as 0 (0%) is not feasible. Thus, PENGKAB IKASI Gunung Kidul does not yet have the infrastructure feasibility fencing. The following diagram trunk.



**Figure 15. Identification Standard Infrastructure Management Eligibility Conditions Fencing based in South Mountain**

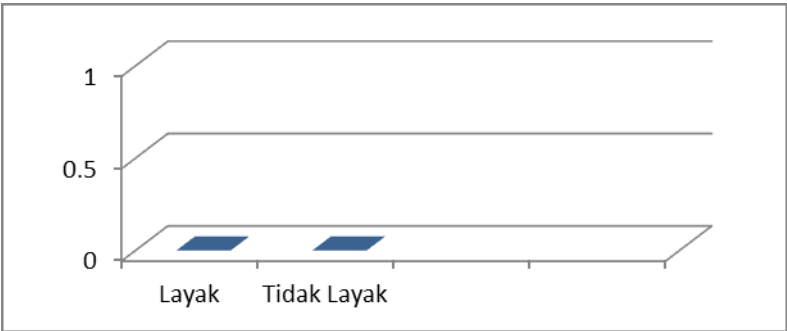
f. Pengda IKASI DIY

From the results of the identification of the pengda IKASI DIY, found that the Infrastructure Management Standards sport of fencing based on ownership status, as many fruit 0 (0%) and fruit belonging to the organization as much as 0 (0%) belong to the individual. Thus, from the identification of Infrastructure Management Standards sport fencing in Pengda IKASI Yogyakarta not have fencing infrastructure. Here's a picture diagram below.



**Fig 16. Identification Standard Infrastructure Management Ownership Status Fencing based in Pengda IKASI DIY**

When considered in terms of the identification of eligibility standards that existing Infrastructure Management, the eligibility status of Infrastructure Management Standards sport fencing at the basis of pengda IKASI DIY is as much as 0 (0%) feasible, and as much as 0 (0%) is not feasible. Thus, the identification of Infrastructure Management Standards sport fencing in pengda IKASI DIY is not having fencing infrastructure. The following diagram trunk below.



**Fig 17. Identification Fencing Infrastructure Management Standards based on the Feasibility Condition pengda DIY IKASI**

## DISCUSSION

The result showed that the identification of Infrastructure Management Standards sport fencing in Yogyakarta mostly belonging to the organization. It is proven that the overall 373 units (67.45 %) belong to the organization, and as many as 180 units (32.55 %) belong to the individual, and as many as 356 (64.38 %) feasible, and as many as 197 (35.63 %) is not feasible. Thus, the results of identification of Infrastructure Management Standards sport fencing in Yogyakarta mostly decent and mostly belong to the organization.

Standard Infrastructure Management is one of the critical needs in a sporting organization such as PengKab., PENGKOT. And Pengda IKASI. With Infrastructure Management Standards that support it will help the process of being able to practice practice practice so that optimal and can achieve a maximum goal anyway. The function of the Infrastructure Management Standards to improve the ability and capacity to be able to optimize the movement of athletes as possible achievement. It is of course a tough task for trainers, coaches, officials, and athletes that the Infrastructure Management Standards adequate or feasible, then when the training exercise can be much more effective and efficient as well as during championships completeness able infrastructure for in use.

After detailed from each region and organization, it turns out from all the organization acquired conditions of Infrastructure Management Standards sport of fencing in the category of decent and belong to the organization, except in PengKab. IKASI Gunung Kidul and pengda IKASI DIY infrastructure that has not been said to be worth much less. Infrastructure is one of the media training for athletes and coaches to train as a support in achieving the maximum target practice in order to achieve maximum performance anyway. If the organization does not have the infrastructure to support the training and matches it will be difficult to develop a pattern of practice to train the athletes, so as to inhibit the athletes in achieving quality and achievement of Training.

Infrastructure Management Standards sport fencing weapon consists of a floret, Sabre weapons, epee, foil mask, Sabre mask, epee masks, piste, recording, metallic foil, metallic Sabre, foil wire body, body Sabre wire, wire epee body, fencing clothes, breast protector, gloves Sabre, floret gloves, epee gloves, fencing shoes, fencing socks, rolling cable, clothes floret practice, and practice clothes epee. Of the 23 kinds of the Infrastructure Management Standards, most already have, but for the amount still to be develop again so that students or athletes do not need to queue long to improve fencing time. For an overview on identification of infrastructure management standards above fencing, fencing of the entire organization that are in the DIY, it turns PENGKOT IKASI Yogyakarta is a sports organization that has the infrastructure fencing exercises most completely, appropriate and adequate, both from the private property and the athlete belonging to the organization PENGKOT IKASI Yogyakarta. It also automatically prove that the good, decent and a lot of infrastructure that is owned by the fencing organization means it can be concluded that the better management based organisation especially in terms of infrastructure owned.

In addition, other evidence is PENGKOT IKASI Kota on PORDA fencing in 2013 managed to become the overall champion in the sport of fencing. It can also be proved that the better, and a decent standard of complete management infrastructure of the organization the better the achievements of athletes. Infrastructure is one of the supporting medium in terms of supporting sporting achievements on the sports organizations.

## CONCLUSION AND SUGGESTION

Based on the research results obtained, the conclusions in this study is the identification of Infrastructure Management Standards sport fencing in Yogyakarta mostly decent and belong to the organization. It is proven that the overall 373 units (67.45 %) belong to the organization, and as many as 180 units (32.55 %) belong to the individual, and as many as 356 (64.38 %) feasible, and as many as 197 (35.63 %) is not feasible. Thus, identification of Infrastructure Management Standards sport fencing in Yogyakarta mostly decent of organisation support and feasible.



## REFERENCES

- Coaching.com. (2011). The Coaching Clinic. <http://www.coachinc.com /CCU/ Programs%20and%20Services/Clinic/>
- Dapan. (2009). Invitasi Woodball antar Pelajar Sekolah Menengah Umum se-Daerah Istimewa Yogyakarta. FIK UNY.
- Faidillah Kurniawan. (2010). Mengenal Olahraga Klasik ; Anggar. Yogyakarta. FIK UNY Press.
- \_\_\_\_\_. (2012). Metode Praktis Latihan Anggar Usia Dini. Yogyakarta. FIK UNY Press.
- Gaugler M.William. (1999). *The Science of Fencing*. Edisi Ke-2. Laureate-Press, Bangor, Maine.
- Garrison, Michael. (2007). *Fencing Instructor*. Mgar919@yahoo.com
- Harlins, Craig. (2005). *What Sports and Martial Arts Comprise Fencing?*. <http://www.fencing.net>
- IKASI. (2000). *Sekilas Anggar*. <http://www.Ikasi Online.htm>. (dikutip: 10 Januari 2008)
- Jargon-Buster. (2007). *Competitive Fencing Southern Region*. <http://www.fencing.Org.uk>
- Lily Istigfaiyah. (2013). Pengertian sosialisasi menurut para ahli. **Error! Hyperlink reference not valid.** 2013/01/pengertian-sosialisasi-menurut-para-ahli.html
- Massik, Michael. (2004). *Fencing Media Guide*. Colorado; USFencingMedia@earthlink.net
- Tomoliyus dan Faidilah (2007). Diktat Mata Kuliah Orpil Anggar. Jurusan Pendidikan Kepelatihan. FIK UNY.

# **ACTN3 R577X POLYMORPHISM AND BODY COMPOSITION PROFILE OF INDONESIAN KARATE ATHLETES**

**Rachmah Laksmi Ambardini**

**Yogyakarta State University, Indonesia  
ambardini28@gmail.com**

## **Abstract**

An elite athletes is a complex trait that influenced by environmental factors and genetic predisposition. Karate is a part of combat sports that requires a high level of physical, physiological, complex technical skill and tactical excellent for success. One of candidate gene for excellent performance is  $\alpha$ -actinin 3 (*ACTN3*). This research was to investigated *ACTN3* R577X polymorphism and body composition profile of Indonesian Karate athletes. The study involved 29 Indonesian elite Karate athletes. Genotyping was performed by polymerase chain reaction and restriction fragment length polymorphism analysis using DdeI enzyme restriction. Body composition (height, weight, body mass index and percent of body fat) were measured. The genotype distribution was RR = 3 (10,3%), RX = 24 (82,8%), and XX = 2 (6,9%). No significant differences in body composition were found among genotypes. In conclusion, R allele was an advantage for success in Karate.

**Key words:** *ACTN3* polymorphism, genetic predisposition, Indonesian karate athletes.

## **INTRODUCTION**

Physical performance is a complex phenotype influenced by environmental (training, diet), behavioral and genetics factors (Gineviciene, *et al.*, 2011). The changes, at both cellular and molecular levels, that occur during physical exercise involve gene expression. For example, the skeletal muscles can vary in efficiency and the cardiovascular system can be more or less subject to fatigue, depending on how genes are expressed. The general hypothesis is that there is an inheritance component affecting physical and athletic fitness that is able to interact with environmental factors, particularly with training. Therefore, to understand the biological aspects of performance it is essential to understand the roles played by genes (Calo *et al.*, 2008).  $\alpha$ -actinin 3 (*ACTN3*) is one gene that indentified as candidate gene for explaining the inter-individual variability.

$\alpha$ -actinin are an family of actin-binding protein that play structural and regulatory roles in cytoskeletal organization. In human skeletal muscles, *ACTN2* and *ACTN3* are an important structural component of the Z disc and anchoring actin thin filaments (Mills *et al.*, 2001). The *ACTN2* gene is expressed in all fibers, while *ACTN3* is restricted to fast twitch fiber (Clarkson *et al.*, 2005). A common human polymorphism of the *ACTN3* gene was identified as a loss of function nonsense mutation replacing an arginine codon 577 (577R) with the premature stop codon (577X). This allele is unable to encode  $\alpha$ -actinin 3 protein, but because the *ACTN2* gene is expressed in both type I and II fibers, it can compensate for the loss of the *ACTN3* protein in type II fibers in individuals who are 577X homozygotes.

The nonsense allele is found in every human population, with a wide variation, implying that balancing selection may have been involved in maintaining the polymorphism. This suggest that the *ACTN3* genotype may be one of the factors that influence normal variation in muscle function (Yang *et al.*, 2003).

Several studies have investigated the relationship between *ACTN3* gene polymorphism and sport performance. Some reports indicated the positive association between the presence of the 577R allele and the capacity to perform high power muscle contractions (Clarkson *et al.*,

2005). The XX genotype is markedly under-represented among elite sprint, strength and power athletes. These previous studies suggested that  $\alpha$ -actinin 3 deficiency has a detrimental effect on the function of fast skeletal muscle fibers (Yang *et al.*, 2003; Druzhevskaya *et al.*, 2008). Karate is a sport that requires a high level of physical, physiological, complex technical skill and tactical excellent for success.

Modern karate consists of numerous repetitions of high intensity actions per fight lasting 1–3 s each, separated by low-intensity hopping-stepping movements ( $18 \pm 6$  s) and short referees' breaks ( $9 \pm 6$  s). Single defensive or offensive technique last  $0.3 \pm 0.1$  to  $1.8 \pm 0.4$  s for the shortest and longest duration actions, respectively (Tabben *et al.*, 2013). Physical conditioning is important for Karate athletes. Because competition is the focal point of athletic training, any training program should mimic the competition and reflect the desired adaptation.

Properly designed plyometric exercises and strength and ballistic training may increase punching and kicking speed, or power. Much of the power in various techniques, not only kicking techniques but also even hand techniques in karate, is generated through the hip rotation and related leg actions. To optimize power generated through the hip rotation, twist, crunches and other variations of rotary movements should be used, and also power exercises such as cleans and snatches should be used to increase power generated through the legs. It has been suggested that flexibility training may be needed to increase the range of motion (Iide, K *et al.*, 2008). Performing resistance training with short rest intervals, traditional cardiovascular interval training, and punching and kicking as quickly as possible with short rest intervals are recommended to increase the ability to buffer acid muscle and blood concentrations. The competitors may perform cardiovascular conditioning 3 days per week for short period of time to assist anaerobic recovery.

Karate is full body contact sport that injury can be happened. The common injuries in karate are sprains and bruises of the fingers, toes, and limbs. Most of these injuries could be prevented by hand, foot, and shin protectors. The significant injury sites are the head, neck, shoulder, and lower back. The strength training program in karate would include the neck, rotator cuff, and core stability and flexibility exercises. In addition to these exercises, the ballistic muscle contractions essential to various karate techniques necessitate development of agonist/antagonist muscle balance.

Overall karate fighting is ranked as a high intensity event. Lehmann (1998) has suggested that anaerobic metabolism is considered as the predominant source of energy in this sport. On the other hand, Beneke *et al.* (2004) have investigated the energetics of karate kumite based on measures of aerobic and anaerobic metabolism during simulated fighting, and concluded that the aerobic metabolism is predominant during this activity, although the decisive actions (i.e., attacks and defense techniques) are maintained mainly via the anaerobic alactic system activation. Determinant actions in karate kumite are based on activities that require a high metabolic rate. Owing to the needs of aerobic and anaerobic demands of karate competition, elite class karate athletes are usually prescribed a mixed training regime that elicits adaptation in both energy pathways. The physiological profile of elite competitors has been presented recently showing the needs of developing both metabolisms in karate athletes (Tabben *et al.*, 2013).

Beside physical conditioning, specific anthropometric characteristics are needed to be successful in this sport. Athletes who have optimal physique are more likely to succeed than those who lack the general characteristics. In athletes, body composition measure are widely used to prescribe desirable body weights, to optimize competitive performance, and to assess the effects of training. It is generally accepted that a lower relative body fat is desirable for successful competition in most of the sports. This is because additional body fat adds to the weight of the body without contributing to its force production or energy producing capabilities. (Shafeeq *et al.*, 2010).

Based on knowledge about the role of *ACTN3* R577X polymorphism in skeletal muscle performance, the aim of this study was to investigate *ACTN3* R577X polymorphism and body composition in Indonesian Karate athletes.

## RESEARCH METHOD

### Subjects

Twenty nine Indonesian Karate athletes of elite and sub-elite level were participated in this study (14 male and 15 female). Subjects gave written consent to participate after being informed of the study protocol and procedures. The Ethics Committee of the Faculty of Medicine of Gadjah Mada University approved the study protocol.

### Body Composition Measurement

The height, weight, body mass index (BMI), and percent of body fat were measured. Body height was measured to the nearest 0,1 cm with the subjects standing with their back to stature meter. Weight was measured to the nearest 0,1 kg. Body mass index (BMI, in kg/m<sup>2</sup>) was calculated as weight (in kg) divided by height (in m<sup>2</sup>). Percent of body fat was determined by measuring the chest, abdominal, and quadriceps skinfolds using a caliper.

### Genotyping

DNA was extracted from peripheral venous blood by standard procedures. Genotyping of the ACTN3 polymorphism was performed using polymerase chain reaction (PCR). The resulting PCR products were genotyped by restriction fragment length polymorphism (RFLP). The amplified fragment subsequently underwent digestion by DdeI restriction enzyme. Digested PCR fragments were separated by 3% agarose gel electrophoresis, staining with ethidium bromide, and visualized by ultraviolet.

## RESEARCH RESULTS AND DISCUSSION

Genotype distribution of RR, RX and XX genotypes in this study was 10,3%, 82,8%, and 6,9%, respectively. The allele frequencies are 51,7 % and 48,3 % for the R allele and X allele, respectively. The distribution of the *ACTN3* genotypes is given in table 1.

**Table 1. *ACTN3* genotype distribution of the athletes**

Sex	n	Genotypes, %		
		RR	RX	XX
Male	14	48,3	85,8	7,1
Female	15	13,3	80	6,7
Total	29	10,3	82,8	6,9

Body composition characteristics were given in table 2.

**Table 2. Body Composition characteristics in total sample**

Characteristics	Mean ± SD
Height, cm	163,0 ± 7,6
Weight, kg	63,1 ± 10,2
BMI, kg/m <sup>2</sup>	23,6 ± 2,5
Percent of body fat, %	15,7 ± 8,9

**Table 3. the *ACTN3* genotype distribution of Kata and Kumite**

Characteristics	n (%)	Genotypes, n ( %)		
		RR	RX	XX
Kata	13 (44,8)	2 (7,1)	9 (85,8)	2 (7,1)
Kumite	16 (55,2)	1 (6,3)	15 (93,7)	0 (0)
Total	29	3 (10,3)	24 (82,8)	2 (6,9)

Our data about physical characteristics of Indonesian Karate Athletes are different to the ones observed by Nezhad and Farhadi (2012) in Iran National Karateka. The height and body mass in Indonesian Karate athletes are lower compared to the above-mentioned study. The difference may be due to the race, diet and effect of training. BMI ( $23,6 \pm 2,5 \text{ kg/m}^2$ ) and percentage of body fat ( $15,7 \pm 8,9 \%$ ) have been an ideal body composition. It is generally accepted that a lower relative body fat is desirable for successful competition in most of the sports, even in Karate.

Previous studies have shown highly significant association between *ACTN3* genotype and sprint/power performance, while the nonfunctional allele (577X) was believed to provide an advantage for endurance performance. The finding of complete absence of XX genotype in our study was low (6,9%). In Australian Caucasians and Asian (Japanese), XX genotype frequencies from 18 to 25% were established (Yang et al., 2007). The frequencies of XX genotype were observed very low (1 to 2%) in Kenyan, Jamaican and American sprinters (Scott et al., 2010). Low frequencies (11%) were reported in Ethiopian athletes (Yang et al., 2005).

*ACTN3* genotype is associated with human athletic performance (Yang et al., 2003). The RR genotype was predominance in the group of individuals practicing speed and power oriented sports (Holdys, 2011). In our research, RR and RX genotype of *ACTN3* gene were found in 27 athletes (93,1%). The R allele of *ACTN3* gene is considered an advantage for speed and power sports.

## CONCLUSIONS

The genotype distribution of *ACTN3* R577X gene were RR = 3 (10,3%), RX = 24 (82,8%), and XX = 2 (6,9%). No significant differences in body composition were found among genotypes. In conclusions, the data indicated that R allele was an advantage for success in Karate.

## REFERENCES

- Beneke R, Beyer T, & Jachner C, 2004. Energetics of Karate Kumite. *Eur J Appl Physiol*, 2:518-23.
- Calo, CM & Vona, G. 2008. Gene Polymorphisms and Elite Athletic Performance. *Journal of Anthropological Sciences*, Vol.86: 113-131.
- Clarkson, P.M., Devaney, J.M., Gordish-Dressman, H. 2005. *ACTN3* genotype is associated with increases in muscle strength in response to resistance training in women. *J Appl Physiol*, 99: 154-163.
- Gineviciene V, Pranculis A, Jakaitiene A, Milasius K, and Kucinskas V. 2011. Genetic Variation of the Human ACE and *ACTN3* Genes and Their Association with Functional Muscle Properties in Lithuanian Elite Athletes. *Medicina*; 47(3): 284-90.
- Holdys J, Krysciak J, Stanislawski D, and Gronek P. 2011. polymorphism of the *ACTN3* Gene in Individuals Practising Different Sports Disciplines. *Biol. Sport* (28): 101-106.
- Iide, Kazuhide., Imamura, hiroyuki., Yoshimura, Yoshitaka., Yamashita, Asuka., Miyahara, Keiko., Miyamoto, Noriko., & Moriwaki, Chinatsu. 2008. Physiological Responses of Simulated Karate Sparring Matches in Young Men and Boys. *Journal of Strength & Conditioning Research*, Vol. 22 (3): 839-47.
- Lehmann G, & Jedliczka G. 1998. Investigations on the determination and development of a sport-event-specific profile of the physical requirements in high-performance training for the sport of karate-kumite. *Leistungssport*; 28:56-61.

- Mills, M., Yang, N., Weinberg, R. 2001. Differential expression of the actin-binding protein, alpha-actinin-2 and -3, in different species: implications for the evolution of functional redundancy. *Hum Mol Genet*, 10: 1335-1346.
- Nezhad MHM & Farhadi H. 2012. A Comparison of anthropometric and physiological characteristics of elite cycling & karate athletes. *Annals of Biological Research*, 3 (1): 628-631.
- Scott RA, Irving R, Irwin L, Morrison E, Charlton V, Austin K, Tladi D, Deason M, Headley S, Kolkhorst FW, Yang N, North K, Pitsiladis Y (2010). ACTN3 and ACE genotypes in elite Jamaican and US sprinters. *Med. Sci. Sports Exerc.*, 42: 107-112
- Shafeeq VA, Abraham G & Raphei S. 2010. Evaluation of the body composition and somatotype characteristics of male track and field athletes in India. *Journal of Experimental Sciences*. Vol 1 (11): 7-10.
- Tabben, Montasar., Sioud, Rim., Haddad, Monoem., Franchini, Emerson., Chaouachi, Anis., Coquart, Jeremy., Chaabane, Heimi., Chamari, Karim., & Tourny-Chollet, Claire. 2013. Physiological and Perceived Exertion Responses during International Karate ny-Chollet, Claire. Kumite Competition. *J Sports Med* Vol. 4 (No. x) xxx.
- Yang, N., MacArthur, D.G., Gulbin, J.P. 2003. ACTN3 genotype is associated with human elite athletic performance. *Am J Hum Genet*, 73: 627-631
- Yang N, MacArthur DG, Wolde B, Onywera VO, Boit MK, Wilson RH, Scott RA, Pitsiladis YP, North K (2005). ACTN3 genotype is not associated with elite endurance athlete status in Ethiopians and Kenyans. *Med. Sci. Sports Exerc. Suppl.*, 37: 472-473.
- Yang N, MacArthur DG, Wolde B, Onywera VO, Boit MK, Lau SYM, Wilson RH, Scott RA, Pitsiladis YP, North K (2007). The ACTN3 R577X polymorphism in East and West African Athletes. *Med. Sci. Sports Exerc.*, 39: 1985-1988.

# **DEVELOPMENT OF LEARNING MEDIA MOVEMENT RHYTHMIC ACTIVITY MODEL FOR STUDENTS SD FORM VCD**

**Siti Nurrochmah<sup>1</sup>, Tatok Sugiarto<sup>2</sup>, Sri Purnami<sup>3</sup>**

**State University of Malang, Indonesia  
itinur\_pjk\_fik@yahoo.com**

## **Abstract**

Learning physical education in elementary schools are material rhythmic activity, but most teachers have not been many who have the knowledge and skills including instructional media rhythmic activity. The research aims to develop instructional media rhythmic activity VCD format. Research using procedural models for generating product . Research subject 1) subject expert and 2) the subject of research objectives: physical education teachers and elementary school students and non-test instruments. Data collection techniques using questionnaires and interviews and data types of qualitative and quantitative form. Data analysis using descriptive analysis. The results of the analysis of small trials on 40 teachers, found 35,56 (88,9%) of respondents chose option B (4,44) means most respondents chose the option to agree with the statement about the kinds of produced in the form and amount of the basic movements and rhythmic gymnastics movement for elementary students and instructional media generated VCD, while 11,1 % of respondents chose option C means not agree to the product movement rhythmic activity. Large group trial of 180 teachers, 173 people (96,3%) respondents chose option A dominant, meaning the respondents agree with the statement about the product of the kind and amount of basic movements and rhythmic activity of instructional media and 3,7% of respondents agreed with the statement of the products produced. Conclusion The results of the research and development of products produced, namely (1) the availability of basic movements rhythmic activity kinds of movement and range of motion footsteps rhythmic gymnastics for students in elementary school environment, and (2) the availability of instructional media rhythmic activity VCD sided wide-a wide range of movement footsteps and rhythmic gymnastics movements for students in elementary school environment and is equipped with a manual learning rhythmic activity.

**Keywords:** development, instructional media, a model of rhythmic movement activities

## **INTRODUCTION**

Education as a priority for accelerated learning in order to educate the nation's children . A key element in the improvement of the nation's children's learning in school is where the quality of each educator competence in order to carry out duties as an educator professionalism . To improve and enhance the quality of education there are some kinds of technologies, one of which is through ( Suprayekti, 2008) Instructional technology is the development and effective use of technology for learners. Instructional technology has a very important role in order to generate innovation and improving the quality and productivity of the learning outcomes.

In order for the education system can be implemented more effectively, important measures include ( Joyce, Weil & Calhoun, 2009): (1) begin to feel the need for a new way to communicate your knowledge and message to students both verbally and non-verbally. Media and tools are no longer the result of human knowledge, but also as a means to communicate knowledge and specialized skills and knowledge and new skills. The existence of a medium of learning in the smooth implementation of learning is much needed in the present and the future.

Improving the quality of education at this time of concern by many people. Improving the quality of education can not work without the presence of educational innovation. Innovation education is an attempt to transform the learning process with all its inherent aspects such as

improvement of teaching and learning facilities as well as improving the quality of professional educators. Education is a basic innovation efforts in improving educational aspects in practice. Educational innovation should be supported by public awareness for change.

Educators in their duties are required to have a number of professional competence inherent in each individual. Pedagogical competence as educators or professionals covering over matter, mastering standards of competence and basic competences subject matter. Updates of knowledge or ability of educators in the field being taught an important issue intensively studied in relation to professional educators.

In the world of education, special education innovation at this time aspects of instructional technology is needed to produce a modern innovation to the advancement of learning in order to improve the quality of education , productivity and user satisfaction of graduates. Innovations in educational aspects such as the use of multimedia in learning interesting to study. Learning physical education in elementary school, this time should be guided by the principles of developmentally appropriate practice (DAP) (Siedentop, 2009), which is based on the learning -oriented approach at the level of growth and development to motivate students to learn.

Learning to apply the principles of DAP is one form of educational innovation and learning in the elementary school environment. At the elementary school level students are able to perform a variety of activities from elementary motion range of motion as the dominant base running, throwing, hop, jump, perform a variety of experiments to perform basic skills, such as kicking a ball is done spontaneously, throwing the ball and others, including in this case is the use and modification of equipment and the equipment needed and used by learners in learning (Siedentop, 2009).

Innovation came from the desire to create a new and socially acceptable. Innovator must have a perception of the needs of people who match the environmental conditions. Based on this concept, there is an important principle in innovation in the field of education, namely (Joyce, Weil, & Calhoun, 2009): (a) innovation originated from a desire to create a new and understandable by the user community, (b) innovation should be simple and focused, so it should be simple and effective, (c) innovation is a small departure from the desire to improve a condition or a requirement, and (d) innovation has always directed that the result will be a pioneer of the changes required by the users (user). Therefore the act of learning is an important innovation and the demand for educators in order to improve the professionalism of the task and the quality of education.

Hence the revival of learning should be created through an effective classroom conditions such learners opportunities to learn more, a strong push to make the students succeed in their study, the presence of high expectations or targets, the optimal involvement of the parents of learners in various school programs. Beside that also the importance of the optimization of existing resources, such as (Caldwell & Spink in Suprayekti, 2009) knowledge, technology (media, techniques and learning tools), material (facilities, supplies, equipment), people (staff, administrative and support staff other ), time ( time allocation, per year, per week per day, a hour) and finance (budget allocation) is important.

Exposure of the innovation education and learning, reflecting a belief that the fundamental importance of education and learning through the application of innovation that is right on target, so as to create an effective school and classroom learning, including innovation culture. The call for a change of culture learning culture focused on educators (teacher-centered or content- centered) towards a culture of learning that focuses on the learner (Buck, Lund, Harrison, & Cook, 2007).

Actions related to modernization and innovation efforts on the educational aspects of instructional media empowerment through learning and in order to realize effective classroom learning culture in line with the changes that began in culture towards a culture focused on learning educators focused on the learner, then the selection and determination and application appropriate use of instructional media is very important and can not be ignored its existence. This is because learning is a means of communication media messages between educators with



learners or between learners. One form of media that is much in demand by educators and learners are learning medium containing VCD form of learning materials related to the material contained in the basic competencies such as learning materials rhythmic activity. Prior to the enactment of the curriculum in 2013, the applicable curriculum in elementary education units contained material rhythmic activity (rhythmic gymnastics movements). The material is supposed to be served in elementary school, but in reality there are some schools that do not present material rhythmic activity. The results of the initial survey on physical education teachers in elementary schools through a questionnaire instrument, it was found that 210 educators assert basic competencies such as rhythmic gymnastics rhythmic activity, 183 people out of 210 people (87,1%) had never been present material rhythmic activity. The level of knowledge and practical skills of rhythmic activity found 189 people out of 210 people (90%) and the less there is that states do not yet have theoretical and practical knowledge about the rhythmic activity.

As a result of these conditions the material can not be transformed rhythmic activity in physical education lessons in primary schools. In addition to obstacles or problems to the knowledge and skills possessed also because of the lack of availability of media about rhythmic activity. Respondents stated of 210 people, 183 people (87,1%) expressed no ownership or availability of instructional media either in person or institution, thus resulting material can not be presented. The results of the initial data collection on instructional media rhythmic activity, found , 191 people (91,0%) of the 210 respondents stated requires knowledge and practical skills about the basic rhythmic activity such as movement or rhythmic gymnastics movements. Additional information, 201 respondents (95,7%) of 210 people claimed to desire the knowledge and practical skills, and 204 people (97,1%) states require media that contains learning materials rhythmic activity.

Interviews with respondents from the students related to learning rhythmic activity, the students said never obtain material rhythmic activity, respondents said the wanted physical learning materials rhythmic activity appropriate to their ability and age in the elementary school environment, and the need of learning media such as VCD contains motion rhythmic activity that can be studied independently by using the media. Meaningful educators and learners need and want most of the instructional media presence rhythmic activity, to facilitate the learning activities. Forms of media is needed in the form of media that can be operated easily by both educators and students.

The problem of the lack of availability of instructional media VCD containing learning material rhythmic activity in the elementary school environment is interesting to study. Therefore, the media has done an assessment of learning and teaching materials in the form of rhythmic activity through research "instructional media development rhythmic activity to learners in the form of a VCD school learning environment". The purpose of this study is the movement produces rhythmic activity and learning media that contain rhythmic activity such as learning basic movements and rhythmic gymnastics movements.

Benefits of product development rhythmic movement activities and learning media of the results of this study are to (1) can be used to help educators transform materials facilitate rhythmic activity in learners. (2) learners: learning media containing movement rhythmic activity can be used to optimize the independent learning and cultivate students to learn independently, create and innovate to manifest the character of students. (3) For Primary School development results can be used to complement the shortage of instructional media, especially the form of a VCD containing material rhythmic activity. (4) For Institutions LP2M help schools to facilitate the provision of instructional media rhythmic activity is the provision of a VCD.

## **RESEARCH METHOD**

This study used two research design, namely: (1) the design of research and development which are used for the first year of Phase I studies. (2) the experimental design used to study phase II second year. Research and development models used in the first phase of the study's

first year (Year 2013) is a procedural model is a descriptive model that shows the steps that must be followed to produce the product. The model was developed and adapted to the characteristics of the resulting shape and referring of Borg & Gall (1983) which consists of 12 kinds of measures that have been modified, the steps in sequence starting activity (1) discussions with educators about the material and physical education instructional media ownership rhythmic activity and the knowledge and skills possessed, (2) to design and create a prototype of a series of rhythmic movement activities, (3) determine the research subjects include (i) the subject experts includes learning specialists , instructional media specialist, physical education learning experts from academia and environmental elementary school environment (teachers), learning expert rhythmic activity ( rhythmic gymnastics ) and (ii) the subject of the research objectives, namely (a) physical education teachers in elementary schools and (b) learners in elementary school, (4) develop the initial product prototype learning rhythmic activity in the form of: (a) the kinds of attitudes arms and legs, (b) various basic movements footsteps and (c) a series of rhythmic gymnastics movement consisting of movement component A, component B, and C components of movement, continued training of various basic movements rhythmic activity and range of motion exercises on elementary school students in the neighborhood, (5) validation is the validation of content through expert evaluation of materials related to the movement of the material basis of rhythmic activity rhythm and range of motion exercises, followed by a revision of the product prototype motions rhythmic activity, (6) the development of instructional media products VCD format that begins with the image capture (recording) including image editing preceded by the drafting of audiovisual media to videos including synopsis, (7) validation of instructional media by media experts as a product of learning main, (8) a small test group of products produced in the form of instructional media VCD containing basic motion rhythmic activity rhythm and range of motion exercises on the subject of physical education teachers targeted 30 people, and learners (totaling 10 students ) after observing media impressions VCD learning, (9) the resulting product revision of the basic kinds of motion and range of motion footsteps rhythmic gymnastics, and revision of instructional media products after observing VCD, based on a review of the experts, including the responses of research subjects. (10) field testing large groups through observation of the basic movements and rhythmic activity of a series of rhythmic gymnastics movement on the subject of the research objectives. The test is done by means of observing the target subject's performance (performance observation) subject rhythmic activity through VCD media impressions. The observation instrument is accompanied by a questionnaire on the subject of the target response (educators and learners ) to draft movement rhythmic activity through VCD aired learning rhythmic activity, (11) analyzed data from a field trial of a large group, (12) the final product development of instructional media either (1) a medium of learning about the kinds of motion VCD basic rhythmic activities and movement and rhythmic gymnastics (2) accredited national journal articles and scientific articles presented at a national seminar.

Subject of research and development consists of (1) the subject experts are learning expert, instructional media specialist, physical education learning specialist, instructional specialist rhythmic activity, expert learning in elementary school physical education and (2) the subject of the research objectives include physical education educators and participants students in the elementary school environment . Variables examined included variables and the development of instructional media development activities rhythmic movement. Research and development using a non-test instruments observation, questionnaires and interviews. Collecting data using observation, questionnaires and interviews on the subject target. Stages in the collection include (1) the preparation phase which includes: a preliminary study through questionnaires for the analysis of school needs and observations to the presence of rhythmic activity of learning materials in primary schools, targeting educators, schools and learners, do library research, designing and creating a framework basic movement concepts and a series of rhythmic activity rhythm gymnastics movements, expert validation of the movement designed and created continued revision, instructional training movements rhythmic activity. (2) the implementation phase of the trial data collection includes a small group of products, product

revisions, deployment and withdrawal of questionnaire responses to the research objectives of product produced (learning media VCD), the resulting product revision and testing of a large group followed by the deployment and withdrawal questionnaires target responses continued research and analysis of the trial results with large groups, and (3) the end of the research activities in the form of instructional media product generates rhythmic activities for elementary school students. Data were analyzed using descriptive analysis approach.

## **RESEARCH RESULTS AND DISCUSSION**

### **Research Results**

Associated with the steps in the research and development, that after the movement was designed and created, validated material subsequent movement to the experts for feedback. The results of the expert content validation through evaluation of materials and based on the results of focus group discussions of learning experts, four experts providing input include: (a) approve the motion exercises designed for each component is the component A, component B and component C. (b) A sequence of movements in the component should be in the sort of movement that is easy to difficult and from the movement of the light to the heavy movement. (c) the movement of components B1 No. 6 is too difficult, it is advisable movement adjusted to the level of growth and development of children, including education level learners. (d) exercise component B2 has a balance of elements characterized by a high level, it is suggested that the amount of movement was designed and created not too much, (e) the exercise component B3 has an element of strength and agility requires a high degree of coordination, movement amount recommended maximum of 3 sets of motion, (f) the exercise component B4 & B5 characterized the movement step, run, and skip / jump, the amount of movement that is designed and created using a few basic movements footsteps, (g) the exercise component C do not appear in the manuscript, suggested exercises designed C and created using elements of movement varying road and jump, (h) any component of motion exercises, it is advisable to use a different rhythm and nuances of children's songs. The results of a special group discussion of instructional media experts providing input: (1) the cover of the VCD cover should use a model elementary school students in accordance with the research objectives, (2) the rhythm is used according to the characteristics of the target research subjects, (3) to facilitate the students to learn material rhythmic activity, there should be instructions are easy to read and known by learners to optimize the independent learning, (4) the rhythm is used not too fast and too slow (tempo rhythm), (5) the movement of each component using a nuanced song child's.

The results of the analysis of data from a small pilot group of learners targeted research on the number 20, found the average response options chosen by respondents was 4,29, meaning that each statement/question, respondents on average chose option 4 is a very good option/strongly agree/very attractive/very appropriate/very precise with measured aspects in the development of instructional media rhythmic activity. Of the 20 respondents who responded 27 the questions/ statements, the majority (86,0 %) of respondents stated attractiveness of the movement of each component is very interesting, respondents said that the movement was designed and created the attractiveness of learning media including VCD and its contents are very pleasant, movement designed and created each component gymnastics (component A, component B1, B2, B3, B4 & B5 and component C) (Winarni, 2012) variation of movement is very good, the implementation of the motion of each component so agree, the movement component A, component B (exercise B1, B2, B3, B4 & B5) and component C has a level of compliance with the age, growth, maturity and level of education according to students is very appropriate, and the suitability and accuracy of the use of the type of rhythm according to the respondents are very suitable and has a value of accuracy with the characteristics of learners. The percentage is included in the criteria of good and acceptable (Bosco & Gustaffson, 1983).

The results of testing a small group on the research objectives of physical education teachers in the elementary schools, the number of respondents 40 people, found the average response options chosen by respondents was 4,44 meaning that each statement/question, respondents on average chose option 4 means excellent option/strongly agree/very

attractive/very appropriate/ very precise with measured aspects for the development of instructional media rhythmic activity. Of the 40 respondents who responded 27 the questions/statements, most (more than 50 % = 88,9 %) of respondents stated attractiveness of the movement of each component is very interesting, respondents said that the movement was designed and created include the attractiveness of the media and their learning VCD it is very interesting and very fun, movement designed and created each component gymnastics (component A, component B1, B2, B3, B4 & B5 and component C) variation of movement is very good, the implementation of the motion of each component so agree, the movement of components A, component B (exercise B1, B2, B3, B4 and B5) and component C has conformance with age, growth, maturity and level of education students, according to educators is very appropriate, and the suitability and accuracy of the use of the type of rhythm according to the respondents is very appropriate and very precise movement and rhythm with the characteristics of learners from elementary school environment. The percentage is included in the criteria of good and acceptable. Advice from physical education teachers, the amount of movement should not be too much for each component. Movement on the B2 component is characterized balance movement, suggested a simple movement and movement combination of quite a set of movements and placed on the last thread on the B2 component. Movement on the B3 component, it is advisable not too much variation in the movement of a set of movements, because the level of coordination of movements elementary school students have not formed optimally.

The results of testing a small group input from experts and educators, has been revised several substances on the movement of rhythmic activity, further refinement of the results of the designed movement including the manual, the foundation used to test large groups.

The results of trials on target large groups of students study in primary school, the number of 50 people, found the average response options chosen by respondents was 4,82, meaning that each statement/question, respondents chose option average  $4.82 = 5$  meaning that the selected option is on a very good option at all/strongly agree completely/very interesting/very appropriate at all /very precisely with measured aspects for the development of instructional media rhythmic activity. Of the 50 respondents who responded 27 the questions/statements, most (more than 50 % = 96,4%) of respondents stated attractiveness of the movement of each component is very interesting, respondents said that the movement was designed and created the attractiveness of instructional media including VCD including content is very interesting and very fun at all, the movement designed and created each component gymnastics (component A, component B1, B2, B3, B4 & B5 and component C) variations of movement very well, the implementation of motion in terms of the principles of motor learning each every component so agree with you, movements in component A, component B (exercise B1, B2, B3, B4 and B5) and component C has a level of compliance with the age, growth, maturity and level of education students, according to student fits all, and the appropriateness and accuracy of the use of the type of rhythm according to the respondents is very appropriate and very precise movements and rhythms with all the characteristics of learners from elementary school environment. The percentage of 96,4% is included in the criteria very well and can be used, meaning that instructional media VCD which contains material movement rhythmic activity and range of motion exercises can be used for learning rhythmic activity to learners in the elementary school environment.

The results of trials on target large groups of educators in elementary school study, the number of 180 people, found the average response options chosen by respondents was 4,81 meaning that each statement/question, respondents chose option median  $4.81 = 5$  means option selected by respondents is in very good option at all/strongly agree completely/very interesting/very appropriate at all/very precisely with measured aspects for the development of instructional media rhythmic activity. Of the 180 respondents who responded 27 the questions/statements, most (more than 50% = 96,3 %) of respondents stated attractiveness of the movement of each component is very interesting, respondents said that the movement was designed and created the attractiveness of instructional media including VCD including content

is very interesting and very fun at all, which was designed and created the movement of each component rhythmic gymnastics (component A, component B1, B2, B3, B4 & B5 and C components) movement variations very well, the implementation of each movement component strongly agree completely, suitability movement in component A, component B (exercise B1, B2, B3, B4& B5) and component C with age, growth, maturity and level of education students, according to educators fits all, suitability and accuracy use of rhythm types according to the respondents is very appropriate and very precise movements and rhythms with all the characteristics of learners from elementary school environment. The percentage of 96,3% is included in the criteria very well and can be used, meaning that instructional media VCD which contains material movement rhythmic activity and range of motion exercises can be used for learning rhythm rhythmic activity to learners in the elementary school environment.

The findings of a large group of test subjects research targeted at educators, respondents expressed strongly agree and am very pleased with the presence of instructional media VCD containing learning materials for learners of rhythmic activity in the primary school (educators strongly agree and very happy once the media spotlight learning rhythmic activity VCD format. Results educator responses to the kinds of rhythmic activity that created the movement and development of instructional media VCD which contains a variety of basic movement and range of motion rhythmic gymnastics, 153 persons (85,0%) of the 180 people responded strongly agree option once/fits all/very precisely and very happy with the creation of the basic movement and range of motion activities gymnastics rhythmic cadence that is in the form of a VCD instructional media , strongly agree response option 24 people (13,3 %) and 3 (1,67%) of the 180 people had agreed to the presence of VCD forms of instructional media for learners in the elementary school environment. Respondents stating learners strongly agree once and was very happy to study media presence VCD containing rhythmic movement activities, 31 people (62%) of the 50 people responded strongly agree and happy, option 12 people responded strongly agree (24 %) and 7 (14 %) of the 50 had agreed on the existence of instructional media rhythmic activity VCD for learners in the elementary school environment that contains a variety of basic movements and rhythmic activity of a series of rhythmic gymnastics movement.

Overall the findings of a pilot group of small and large targets on the subject of the research, respondents generally expressed, and the attractiveness of learning media including VCD content is very interesting and very fun at all , movement and variation of movement that is designed very well, in terms of movement execution motor learning principles strongly agree once and exercises have suitability with age, growth, maturity and level of education of learners, use the type of rhythm is very appropriate and very precisely with the movement and characteristics of learners. Thus learning media rhythmic activity VCD which contains material movement and rhythmic activities of a series of rhythmic gymnastics movements can be used on students in the elementary school environment.

## DISCUSSION

Based on the validation results of the content analysis of data from trials of small groups and large groups, having previously taken the content validation process by a team of experts and after going through the process of testing small and large groups , that the majority of respondents stated educators and learners need and want a presence rhythmic activity materials to support the implementation of learning on the basis of competence rhythmic activity. Therefore, the movement has produced a series of rhythmic activity and body movement exercises such as rhythmic gymnastics.

Movement generated rhythmic activity include (a) a variety of basic movements rhythmic activity as a form of movement that can be used for warm-up exercises (component A) in the form of various movements footsteps number 9 kinds of movement and gymnastic movements of the body in the form of a series of movements rhythmic gymnastics (exercises core = component B) which consists of motion exercises B1 component number 6 wide range of motion, balance training exercises B2 component number 5 wide range of movement , B3 component exercise (strength training and agility) 3 number range of motion , exercise B4 &

B5 exercise component steps , run, jump and jump together number 4 kinds of movement and exercise components of C (appeasement) number 3 wide range of movement (using the movement of step exercises footsteps on component A).

Content validation is done in order to determine the value of the material accuracy of the rhythmic gymnastics movements designed with the age of the current and potential students. Validation of the content in this study reached by way of reviewing draft material content of each movement rhythmic activity of each component and combined with the draft while recording video. Validation is the process of validating the contents of an instrument that is based on the use of the power of reason (logic) instrument for analysis of the material or the content of validated instruments. Validate the contents of the instrument if the instrument involves a comparison criterion, then the resulting instrument would be better (Lacy, 2011). Validation of the content in this study compared with observations motion video display rhythmic activity, so that the material has validated the accuracy value in accordance with what is to be assessed that about design material movement rhythmic activity.

The first product of this study form the basis of the movement of the rhythmic activity of learning rhythmic activity. Students who learn to expect additional meaningful learning experiences for life. Learning rhythmic activity of smooth movement tendency and more inclined to involve the small muscles in the movement , besides that it also began a more refined motor skills and focus and is able to perform fine motor activity and complex . Movements do start to lead the movement is complex, complicated and fast movement and be able to maintain the proper balance (Siedentop, 2009). With reference to the characteristics of elementary school children aged 11-12 years old, has developed basic movements and range of motion activities rhythmic gymnastics rhythm.

The application of learning theory in the learning movement is important so that students are able to learn the motion in accordance with the ability or potential of the students. Lessons learned motion including rhythmic activity that requires a wide variety and range of motion should be designed based on the principle of the DAP (developmentally Appropriate practice model) is learning refers to individual learning approach (individualize instructional approach) means a form of learning that is centered on the students and tried according to the conditions physical and psychic son (Newell & Liu, 2012).

Higher learning in the classroom has the characteristics such as demonstrating a variety of skills associated with personal safety, try to change the pattern of motion to the rhythm in motion a series of variations, demonstrating the range of motion with a musical instrument or doing exercises to improve the physical quality including a variety of motor movement (Anitah, 2011). Thus the basic movements of rhythmic activity developed in the study of research and development is in line with the principle of learning in high-grade elementary school children.

Learning rhythmic activity for students is an attempt to help children develop normally, without having to experience difficulties in the move. Sensitivity rhythm child becomes the main target of learning rhythmic activity, in addition to also help develop coordination skills adequately motion anyway. Even further, this activity will help children to become people who have a good appreciation of the aesthetic values of human motion.

There are four pillars that need to be considered in the study , namely learning to know (learning to know), learning to do (learning to do), learning to live together (learning to live together ) and learning to be (learning to be). The four pillars must be applied to the process of learning in primary schools both in the classroom and outside the classroom are included in the physical education teaching (Subroto, 2008).

Learning physical education in the elementary school students should be adjusted to the rate of growth and motor development as well as meeting the needs of students who refer to the purposes learning physical education, so that various kinds of movements that are designed according to the conditions of growth and development as well as the level of maturity of the students (American Academy of Pediatrics, 2008).

Based on discussions and input /suggestions submitted by the team of experts, said that the media VCD produced and contains a series of rhythmic movements such as basic movement

activities all sorts of footsteps and a series of quite interesting rhythmic gymnastics movement and the movement in accordance with the script video scripts. Pretty good impressions of each movement and rhythm/music accompaniment also precise and clear. The images shown are sufficiently bright clear, thus helping students to learn independently. The video is also accompanied by the appearance of the code number indicating the count of each movement, so as to optimize the potential for students to learn independently.

The views/comments of the expert team also supported/same as the response of educators, so that products containing circuit VCD media movement rhythmic activity can help educators in transforming the material to provide additional learning experiences in particular material on the rhythmic activity of learners. The number of movements that exist at VCD media by respondents said not too much movement and the student is able to perform well. Besides, the students also found, so that students can study independently, then the need and existence of instructional media such as VCD is very important. This can be understood as a media form of VCD, can be played back so as to improve the ability and willingness of students to learn by using the appropriate media and independence in learning can be realized.

Instructional media are very precise form of VCD as a learning medium. Privileged use of video, among others: (1) to record events or occurrences in the form of sound and at the same time in such a short time can be displayed back the recording, (2) use can be repeated, (3) demonstration of the skills taught can be complicated, (4) by using a large number of video viewers can get information from people who are experts or specialists, (5) hard weak sound can be measured and adjusted to the needs and can be inserted with comments or other sounds (Hastie, 2006).

The advantages of using video are: (1) may indicate certain back movements, (2) student performance can be immediately traced back to criticism and evaluation, (3) to get the content and structure of the whole of the subject matter or practice and can be realized interactively with books work, manual/guide books, text books, tools or other objects that normally for field activities, (5) information obtained is presented simultaneously at the same time at the location (class) that is different from the number of spectators or participants infinite, (6) creation of an optimal self-learning activities for the students were able to learn at their own pace can be designed (Anitah, 2010).

Product research and development results in the form of a VCD intended instructional media being one of the 6th grade students, grade 6 including high grade, have distinctive properties during the high classes of primary school, namely (Wardani, 2005): the existence of an interest in the life practical day-to-day concrete, has a curious nature and want to learn, start requiring people to assist in a more mature finish its work, and began efforts to form a group of friends to play, and began to require certain motor skills to support skills in play.

Motor skills play an important role in the success of learning rhythmic activity and motor activity are highly diverse. This period also children have started to practice tirelessly to achieve success and be proud of its achievements (Newell & Liu, 2012). With practice can increase movement speed, more agile physical condition, it can be obtained accuracy in moving (Lumpkin, 2008). Children aged 11-13 years (grade V and VI) and the energy started strong, and needs required the child starts require proper training materials and in accordance with the growth and development and the level of maturity of the students, so that children are motivated to learn or practice (Joyce, Weil, & Calhouin, 2009).

Associated with products derived from this study is the availability of instructional media rhythmic activity in the form of a VCD, Budiwanto (2010) conducted a study on "the development of the basic techniques of video media skills badminton game", the results are reported that audio-visual media provide effective results, interesting and has a value significance in support of the learning skills at Badminton lesson Badminton theory and practice for students majoring in Physical Education and Health FIK - State University of Malang.

Leser, Read, & Uhlig (2011) conducted research on the effectiveness of the use of Multimedia in supporting learning of physical education, the conclusion of the study reported

that multimedia is very effective in supporting learning motor skills and the use of multimedia in learning can increase the motivation of learners.

It can be concluded that the development of instructional media rhythmic activity form of a VCD is a right solution because in media products can help educators in the transformed material to students.

VCD media in this study can not be said to have value as a medium effectiveness and practicality of learning, because to determine the effectiveness and practicality of including the significance of media, the assessment needs to be done through experimentation in the form of experimental testing in experimental research. Therefore, in order to know its effectiveness VCD products, the researchers plan to conduct experimental research budget in 2014 to test the effectiveness and practicality of VCD media generated from the phase I study in the first year.

## CONCLUSION AND SUGGESTION

Conclusion The results of the research and development of products, namely (1) the availability of basic movements rhythmic activity kinds of movement and range of motion footsteps rhythmic gymnastics for students in elementary school environment, and (2) the availability of instructional media rhythmic activity VCD sided wide-a wide range of movement footsteps and rhythmic gymnastics movements for students in elementary school environment and is equipped with a manual learning rhythmic activity.

## REFERENCES

- American Academy of Pediatrics (AAP). 2008. "Strength Training by Children and Adolescents". *J Pediatrics*. Vol. 121. (4) 2008 pp. 835-840. Diunduh dari <http://www.pediatrics.org/cgi/doi/10.1542/peds.2007-3790>.
- Anitah, S. 2010. *Strategi Pembelajaran di SD*. Jakarta: Universitas Terbuka.
- Anitah, S. 2011. *Strategi Pembelajaran di SD*. Jakarta: Universitas Terbuka.
- Borg, R. W., & Gall, M.D. 1989. *Educational Research, an Instructional*, Fifth Edition. New York: Longman.
- Bosco, J.S. & Gustafson, W.F. 1983. *Measurement and Evaluation in Physical Education, Fitness, and Sports*. New Jersey: Prentice-Hall, INC.
- Buck, M. M., Lund, J. L., Harrison, J. M., & Cook, C. B. 2007. *Instructional Strategies for Secondary School Physical Education*. Sixth Edition. San Fransisco: Mc Graw Hill.
- Dwiyogo, W. 2008. *Aplikasi Teknologi Pembelajaran. Media Pembelajaran Penjas dan Olahraga*. Malang: Departemen Pendidikan Nasional. Universitas Negeri Malang. Fakultas Ilmu Pendidikan.
- Hastie, P. & Martin, E. 2006. *Teaching Elementary Physical Education. Strategies for Classroom Tecaheer*. New York: Pearson Benjamin Cummings.
- Joyce, B., Weil, M., & Calhouin, E. 2009. *Models of Teaching. Eight edition*. New Jersey: Publishing as Allyn & Bacon.
- Lacy, A.C. 2011. *Measurement and Evaluation in Physical Education and Exercise Science. Sixth Edition*. Toronto: Benjamin Cummings Pearson.
- Leser, R. Baca, A. & Uhlig, J. 2011. Effectiveness of Multimedia-Supported Education in Practical Sports Courses. *Journal of Sports Science and Medicine*. 10. hal. 184-192, <http://www.jssm.org>. Diakses tanggal 15 Mei 2013



- Lumpkin, E. 2008. *Introduction to Physical Education, Exercise and Sport Studies. Eighth Edition*. Kansas: McGraw Hill Companies.
- Newell, K.M. & Liu, Y.T. 2012. Function of Learning and the Acquisition of Motor Skill (With Reference to Sport). *The Open Sports Science Journal*. 5. Suppl) pp.: 17-25.
- Siedentop, D. 2009. *Introduction to Physical Education, Fitness & Sport*. Santiago: McGraw Hill Higher Education.
- Subroto, T. 2008. *Strategi Pembelajaran Pendidikan Jasmani*. Jakarta: Universitas Terbuka.
- Suprayekti, Dickey, Jalil, A., Panen, P., Winataputro, U. & Andayani. 2008. *Pembaharuan Pembelajaran di SD*. Jakarta: Universitas Terbuka.
- Wardani, IG.A.K. 2005. *Psikologi Belajar*. Jakarta: Universitas Terbuka.
- Winarni, S. 2012. Pengembangan Aktivitas Ritmik bagi Siswa SLB-A. *Procee-ding Ruang Sosialisasi dan Optimalisasi Potensi Anak Penyandang Cacat*. Surakarta: Asisten Deputi Olahraga Layanan Khusus Deputi Pembudayaan Olahraga KEMENPORA RI. Surakarta, 3-5 Desember 2012.

# **REVITILIZING SEPAKTAKRAW NINJA SMASH USING HANGING BALL AND MATTRESS**

**I Ketut Semarayasa**

**Education University of Ganesha, Indonesia**

**semarayasaiketut@yahoo.com**

## **Abstract**

Sepak takraw sport is kind of a mix of soccer and volleyball games, competed in a field whose size resembles a badminton court size doubles game and the player may not touch the ball with his hands. Sepak takraw game has become a popular game among both the general public and students. But the achievement has not been encouraging. Its achievement in Southeast Asia is still under Thailand and Malaysia. There are many factors that influence it. One of them is the low ability in sepak takraw basic skills. Therefore, it is strongly needed the strategies and techniques to learn and practice the basic skills properly, especially smash technique. Smash was hitting the ball hard, sharp and fast over the net that are directed to the opponent's field to get the score. Sepak takraw smash is one of the most important techniques which must be possessed by a player, because by performing it, it is easier for the team to win the game. Among many type of smash, Ninja smash is one of those popular yet difficult to perform. It uses one leg and body position facing the chest horizontally with nets. Due to its popularity as well as its difficulty, it needs a lot of practice and strategy. This paper then is intended to describe the technique which can be implemented in practicing ninja smash.

**Key words:** Revitalizing, Ninja Smash, Ball Hanging, Matras

## **INTRODUCTION**

Sepak takraw games is a team sport in which its implementation is the same as those which use the net, the ball, and pitch as well as other regulations. Sepak takraw sport is kind of a mix of soccer and volleyball games, played on a badminton doubles court and the player may not touch the ball with his hands (Kurniawan, 2011: 107). Meanwhile, Zahari (2008) stated that the sepak takraw game using body parts such as head, shoulders, back, chest, thighs, legs, but not the hands. Sepak takraw sport is more popular in Indonesia, both in rural and urban areas. It can be seen from the increasing number of sepak takraw clubs which begins to arise. This shows that people are starting to love this sport. Nevertheless, the problems are still exists in which they are caused by the improper training held. Many people who join the club and practice sepak takraw do not have good knowledge on how to practice the game especially the basic skills properly. Moreover, the good mastery of sepak takraw basic skills is actually one of the main prerequisite to enable the players to perform well.

Sepak takraw sport is soccer game which has been modified to be used as a competitive game. Football sports as the basis of sepak takraw game is a traditional Indonesian game sport played by 6-7 people in a circle. Sepak takraw originated from two words namely football and takraw. "Football" means something with legs kicking motion, by means of swinging the leg in front or to the side, while "Takraw" means a round ball or items made of woven rattan. Therefore, sepak takraw sport is football that has been modified to make it as a competitive game. Meanwhile, according to other experts say that sepak takraw ball is kicked to the side of the foot, the inner side of the foot or the outside of the foot is made up of three players so we need a team work and skills of each individual which it contains some elements of physical condition should be required in sepak takraw such as strength, speed, agility, endurance, coordination, balance, explosive power, and others. In addition to elements of the physical

condition, a player must master a variety of basic techniques in playing sepak takraw . One of them is smash.

Smash in sepak takraw has a level of complexity and varying complexit, from simple skills to the complex ones. In light of the level of difficulty and complexity, ninja smash has a high level of difficulty and complexity because it includes elements; hand and foot-eye coordination, timing, tempo, rhythm step, dynamic balance and accuracy. In order to do a good ninja smash, it need a good learning methods or an effective training method as well as a systematic progression. By giving a suitable strategy in the training implementation, it is expected that the goal of exercising can be achieved optimally. Without a proper technique, the desired goals can be reached effectively.

Sepaktakraw actually has lot of basic skills to master. One of them is ninja smash. This smash is very unique and very important in gaining score quickly. However, it is a fact that it is not an easy skill to perform. Ninja smash is one technique that is very important ( fundamental ) in sepak takraw which has fairly high complexity of movement making it more difficult to be learned by the prospective sepaktakraw athletes, especially for those who do not have enough skills. Of course, great efforts are highly demanded to improve the ability of the ninja smash.

One effort which can be implemented us by administering a proper way in exercising. It is better for the trainers to establish an effective exercising strategy and environment to help the learners to gain their competences in mastering ninja smash. Therefore, it needs to be designed a method and appropriate learning strategies so that students can learn easily, manage student and pick appropriate methods and instructional strategies that can stimulate student interest in learning so that students do not get bored in the learning process. Determination methods and learning strategies as well as proper exercise is closely related to the learning situation that should be taken into account by the trainers. Besides, in order to be able to employ methods and instructional strategies well, firstly it is needed to explore the factors that influence the ninja smash skills in the sepaktakraw game. There are some factors influence it, such as endurance, speed, flexibility, accuracy, balance, power and coordination.

Due to its importance, this article then is intended to describe the nature of ninja smash and how to practice it properly. Hopefully, it can be beneficial for those who practice sepaktakraw game and can give insight on the sepaktakraw games on techniques which can be employed in order to help their learners in mastering basic sepaktakraw skills, especially ninja smash.

## **DISCUSSION**

### **A. SPORT**

Based on oxford dictionary the word sport means an activity involving physical exertion and skill in which an individual or team competes against another or others for entertainment. Sport is a series of body movements that organized and planned which are done to achieve a specific purpose ( Lutan, et al , 2006:57 ). While according to Cholik Mutohir sport is a systematic process activity or business that can be pushed to develop , and nurture the potential physical and spiritual person as an individual or member of the public in the form of the game , the race / game , and the crowning achievement in the formation of the Indonesian people fully quality based on Pancasila ( Widodo : 2010) .

Sports, on the other hand is a form of organized games and is competitive. Some experts consider that a sport solely organized form of the game, which puts it closer to the term physical education. However, a more careful examination shows that traditionally, sports involving competitive activity . When we refer to the sport as an organized competitive activity, we perceive that the activity has been enhanced and formalized to some extent, so it has several forms and processes remain involved. Regulations, for example, whether written or unwritten used or worn in such activity, and the rules or procedures can not be changed during the activity, except upon agreement of all parties involved.

Among those definitions , sport is a competitive activity . We can not interpret the sport without thinking about the competition, so that without competition, the sport turned into a mere play or recreation. Play, so at one moment into the sport, but on the contrary, sport is never

merely playing; due to the competitive aspect of paramount importance, as is the case in the game sepak takraw.

In short, sport is all forms of usually competitive physical activity which, through casual or organised participation, aim to use, maintain or improve physical ability and skills while providing entertainment to participants, and in some cases, spectators. Sports are usually governed by a set of rules or customs, which serve to ensure fair competition, and allow consistent adjudication of the winner. Winning can be determined by physical events such as scoring goals or crossing a line first, or by the determination of judges who are scoring elements of the sporting performance, including objective or subjective measures such as technical performance or artistic impression.

## **B. SEPAKTAKRAW GAMES**

Sepak Takraw was created by the royal family of Malaysia about 500 years ago. The name itself comes from two languages. Sepak is "kick" in Malay, and Takraw is the "ball" in Thai. When it is born, It looked like Japanese "Kemari", and some became a circle, and a pole was kicked, and the number of times was being competed in. It looks very similar to the Japanese traditional game, "kemari" where the players form a loose circle and the number of times the ball is kicked before it touches the ground is counted. In 1965 the game was unified into the present volleyball style with the addition of a net and the adoption of international rules.

Sepak Takraw is a kind of mixture of sports from soccer and volleyball played on a badminton doubles court, and the player may not touch the ball with his hands. Sepak takraw much in demand by the public for sepak takraw game can be played indoors and outdoors even now also be played on the beach or often called Beach Takraw (Aji, 2013). The game is derived from the Malay Sultanate era ((634-713)) and is known as the Football Venues in Malay. The ball is made of woven rattan and players stand in a circle. Sepak takraw game is a game that combines two traditional football game played in the volleyball court size is like the size of doubles badminton court (Sofyan, 2009: 1). Sepak takraw is a game that uses a ball of rattan or plastic (synthetic fiber) is done on a rectangular field, flat, open or closed, and the field is limited by the net (Solomon, 2008: 19). Simply put the game sepak takraw can be said to have equal blend of soccer, volleyball, or badminton. Resembles a football because the game in playing sepak takraw ball using body parts as well as in a football game (ie; legs, head or other body parts except the arms). Resembling volleyball and badminton because both use the net and approach the game of badminton court size (Engel, 2010: 23). Sepak takraw game was held in a closed court provided that qualify. Field size is 13.40 mx 6.10 m free from all obstacles to over 8 m measured from the floor surface with a net height of 1.55 m (Maseleno and Hasan: 2011).

The court and the net height and size are identical to those used in badminton and each team has three players. The rules are very similar to those in volleyball, with the following five important exceptions. the use of hands is not permitted; Each player may touch the ball only once before it is kicked over the net; There is no rotation in the defense position; It becomes a score (net in) even if the ball touches the net before falling into the companion court. The player who kicks a serve surely puts a leg (shaft foot) in the service circle, and takes a toss from the player who went into the quoter circle (the semicircle of a radius 90 cm done around the contact point of the center line and the sideline), and kicks the ball.

When a game begins by one serve, a ball can be touched by the attack of one time to three times. You can use a head, a back, legs, and anywhere except for the arm from the shoulder to the point of the finger. The team which scored two sets out of three sets first get the victory in the game. Each sets consist of 15 points. Only 6 points of the the third set are systems.

There are 2 kinds of balls of the thing that the thing edited in the stem of 9-11 rattan, and the shape were imitated with the plastic and which was made. A ball made of the plastic is being used as an official ball from the 11th Beijing Asian convention. The weight of the ball is 170g-190g, and the size of it is a perimeter 40cm, and there is a hole of 12 in it. It is much smaller than a handball, a little bigger than a softball.

The game is played by two teams, each team consisting of 3 people and 1 person each team comes up and the team consists of 3 teams and a team of reserves and the number 1 team should not be more than 12 people ( PSTI , 2007:31 ) . According to Solomon (2008 ) , playing sepak takraw goal of each party is to return the ball so that the ball can fall on the ground to make the opponent or the opponent causing offense or an opposing player makes a mistake.

Sepak takraw is a team sport held in the form of games using the net , the ball, and pitch as well as other regulations ( Semarayasa , 2010: 66 ) . Games sepak takraw using body parts such as head , shoulders, back , chest , thighs, legs, except the hands. Simply put the game sepak takraw can be said to have equal blend of soccer, volleyball, or badminton. Resembles a football because the game in playing sepak takraw ball using body parts as well as in a football game ( ie ; legs , head or other body parts except the arms ) . Resembling volleyball and badminton because both use the net and the field size approaches the game of badminton.

In order to be able to play sepak takraw well and properly, one is required to have a good ability or skill . It means that without having good skills , it is impossible for the sepak takraw athlete to perform the game very well. How to play the ball in the game sepak takraw namely, by using the feet , head , or body provided that in case of bouncing . To be able to return the ball to the field or to the opponent each team allowed to touch , kicking or heading the ball three times , whether it is done by the three players the team members or just one of these things does not matter , the important thing is every team in the sepak takraw game has the right to touch the ball three times takraw or kick the ball around using foot parts, plays ball with the head ( around the head ), the chest, the thighs, the shoulder, ( shoulder ), and with the sole of the foot and the ball should have been heading to opponents field ( Solomon , 2008:45 ) .

As cited in [http://takraw.webark.org/basic\\_skills.html](http://takraw.webark.org/basic_skills.html), there are basic skills which must be mastered by prospective athlete sepak takraw. 1) Knee/Thighkick. The knee and thigh is used when the ball comes fast towards the area between the the player's knees and his waist. This skill is used to "bump" or deflect the ball up enough to use an inside kick to control the ball. It is also used when kicking consecutive kicks or in a circle and the ball gets to close to your body. The motion is like a high step marching motion.2) Header. The header is probably the second most important skill to have, especially in the net game. The header is used to pop up a ball that comes higher than the waist. The best way to learn the header is like the inside kick. The contact point should be just above the forehead at he hairline, not too much on the forehead and not too much on the top of the head, right in between. 3. Front kick/Toe kick. The toe kick is a defensive kick, great for saving a ball that has gotten out in front of the player. It is not, however, a good control kick. Those who play soccer may disagree, but in sepaktakraw the inside is the right way. Learn the toe kick for saves,the inside for control. The toe kick is achieved by placing the foot out for the ball and depending on the height of the, either lifting the foot with your hip or just letting the ball bounce off.

### **C. NINJA SMASH**

Smash is smash punch made with legs sticking up chasing the ball , made with a round body ( without overhead ) in the air ( Solomon , 2008: 33 ) . Spike is a form of attack that is most widely used for the attack in an attempt to score points, a team or in a game . Meanwhile, according Muslimim (2013) , smash opens a series of movements that include the pre activity , while jumping , while hitting the ball and landing. Smash success is strongly influenced by the coordination ability and level of sensitivity using the senses .

From the above statements, it can be concluded that the technique of Smash or spike is to play with the ball efficiently and effectively in accordance with the rules of the game to reach the hard knocks that are usually lethal to the sepak takraw game. It is actually the quickest time to win the game to get maximum score. In playing Sepaktakraw, the activities involved are actually a series of activities that involve a large number of muscles in torso and limbs of the top and bottom . Smash movements in desperate need of organizing a number of large muscles of the body and also great exertion . Skills in sepak takraw is classified on the type of coarse motor skills because the sepak takraw game and contraction involved using large

muscles . These motor skills are not only determined by genetic factors, but is also determined by training factors ( Bompa , 2000: 43 ). There are four basic skills in playing sepak takraw, namely 1 ) service, 2 ) passing, 3 ) a heading, 4 ) smash, 5 ) block ( PSTI , 2007: 4 ) . Smash in the game of sepak takraw include : kedeng smash, Straigh smash, scissors smash, feet smash, and the latteris ninja smash.

According to Angel (2010:62), ninja smash is done by utilizing the opponent's ball stomach or other means to resolve quickly smash the ball low stomach near the net, especially if the ball moves forward. Below are the steps in performance such smash. a) Facing towards the ball with an upright body position with net ; b) Stepping foot which is close to the front and jump with your legs as high as possible; c) When jumping, put the body in an horizontal body position on the foot that is used to jump, turn the body so that chest faces the net, and the whole body will be parallel to the net ; d) When the body is on the horizontal position, expand the foot to kick up higher than the body and swing as hard as possible and smash the ball with a sweeping motion while turning the body facing the net and smash the ball with the instep or toe, and follow the movement of land; e) Make sure the two open palms facing down in preparation for landing.

#### **D. EXERCISING NINJA SMASH USING HANGING BALL AND MATTRESS**

In doing the exercises, especially practicing Ninja Smash, the trainers may use media like hanging ball and matrass to help the learners. Below are the procedures to implement it.

1. Horizontal kick on a thick mat. Place a soft thick mat (about 12 inches thick) under the hanging ball, so players will not be afraid to do a horizontal position in the air. Players will jump (with feet are not for kicking) from beside the mat, then kick this down on the mat, ideally with the kicking foot and both hands. Be sure to put both hands on the learner's sides with his palms facing down. When landing it is almost like a push-up position.
2. Horizontal kick on the thin mat. When players are getting better in performing the skill, replace the thick mattress with a regular mattress which is thinner, do the above ways.
3. Kick horizontally on the floor. The final step is to take the mat and ask the player to kick the ball while jumping and landing on the floor. At this level, for security, ask the players wearing protective elbow and wrist crutch.

#### **CONCLUSION**

Finally, it can be concluded that in order to perform the game very well, every player of sepak takraw must know and able to apply all basic skills in sepaktakraw, include ninja smash. Ninja smash is not actually a difficult skill to master unless the learner has a high commitment and discipline to practice. Besides, it also need a good effort from both parties, either the learner and the trainer to obtain the intended goal of every practicing activity.

In practicing ninja smash, it can be done gradually by using hanging ball and mattress. The usage of mattress is also varying , it depends on learner's need. It can be thick or thin one, or even the regular one. By keeping in mind that practice makes perfect, it is not possible to master this skill very well. In addition, besides having a strong desire to practice, in to be able to master the ninja smash, the player must also have patience, perseverance, and courage. When these are acquired by the learners, ninja smash is not difficult anymore. Everyone can play it with fun.

#### **SUGGESTION**

There are two parties noted here. First is for the learners. It is strongly recommended for the learners to build a strong motivation in practicing the skills. Motivation is actually the key to run the effort smoothly. It is the root to success including the success in mastering the ninja smash. It need his patience, courage, and persistence to practice. Second, is for the trainers or

coaches. It is suggested that they should be a good motivator for their learners, monitor every progress made by their learners, and facilitate them to achieve their indented practice goal by finding new way or technique in exercising. Therefore, the exercise atmosphere can be conducted in positive environment which always encourage their motivaton to practice.

## REFERENCE

- Anonym. 2012. Basic Skills of Sepaktakraw. <http://takraw.webark.org> (Accessed on March 172014).
- Aji. 2013. *Pola Pembinaan Prestasi Pusat Pendidikan dan Latihan Pelajar (PPLP) Sepak Takraw Putra Jawa Tengah Tahun 2013*. Jurnal Media Ilmu Keolahragaan Indonesia Volume 3. Edisi 1. Juli 2013. ISSN: 2088-6802.
- Azhari Taga. 2008. *Effect of Diameter on the Aerodynamics of Sepaktakraw Balls*. Malaysia: <http://www.worldacademicunion.com/journal/SSCI/SSCIvol02no02paper07.pdf> [Accesed on 15-1-2014].
- Bompa. 2000. *Total Training for Young Champion*. Champign: Human Kinetics.
- Engel, Rick. 2010. *Dasar-dasar Sepak Takraw*. Jakarta: PT Intan Sejati.
- Lutan, dkk. 2000. *Manusia dan Olahraga*. Bandung: FOK IKIP Bandung.
- Kurniawan, Feri. 2011. *Buku Pintar Olahraga*. Jakarta: Laskar Aksara
- Maseleno A dan Hasan M. 2011. *Fuzzy Logic Based Analysis of the Sepak takraw Games Ball Kicking with the Respect of Player Arrangement*. World Applied Programming, Vol (2), Issue (5), May 2012. 285-293 Special section for proceeding of International E-Conference on Information Technology and Applications (IECITA) 2012. ISSN: 2222-2510 ©2011 WAP journal. Tersedia pada . [www.waprogramming.com](http://www.waprogramming.com). [Accesed on Januari 18, 2014]
- Muslimim.2013. Smash dalam Permainan Bola Voli. Tersedia pada <http://muslimin40porf.wordpress.com/79/> ( Accesed on March 14, 2014)
- PB PSTI. 2007. *Peraturan Permainan Peraturan Perwasitan dan Peraturan pertandingan Sepak Takraw*. Jakarta: PB PSTI.
- Semarayasa, I Ketut. 2010. *Pengaruh metode pembelajaran dan Tingkat Motor Educability terhadap keterampilan teknik dasar bermain sepak takraw*. Jurnal Pendidikan dan Pengajaran Jilid 43 No 1 Hal 1-88 Singaraja April 2010. ISSN 0215-8250.
- Simanjuntak, Victor G. 2008. *Pendidikan Jasmani dan Kesehatan*. Jakarta: Dirjen Tinggi. Depdiknas.
- Sofyan, M. 2009. *Permainan Sepak Takraw*. Jakarta: CV Ricardo.
- Sulaiman. 2007. *Permainan Sepak Takraw*. <http://sulaiman-fikunnes.blogspot.com/2007/10/sepak-takraw.html> [Accesed on January 18, i 2014].
- , 2008. *Sepak Takraw: Pedoman Bagi Guru Olahraga, Pembina, Pelatih, dan Atlet*. Semarang: UNNES Pres.

Widodo, Dwi Cahyo.2010. *Pendidikan Jasmani dan Bermain*. Tersedia pada <http://onopirododo.wordpress.com/2008/11/14/pendidikan-jasmani-olahraga-atau-bermain-ya/>. [Accesed on March 14, 2014].



# MENSTRUATION AND FEMALE ATHLETE'S PERFORMANCE

Indah Prasetyawati Tri Purnama Sari

Yogyakarta State University, Indonesia  
indahprasty@uny.ac.id

## Abstract

Menstruation is a periodical bleeding which occurs in normal women every month. Many people question whether it affects a female athlete's performance. Actually, the performance is influenced by both external and internal factors. Menstruation is one of these internal factors which influence the performance. It is related to a kind of hormone produced by human body, especially reproductive hormone. Two syndromes which often occur when a female athlete is involved in sport, especially in a heavy training, are FAT and AMI. FAT (Female Athlete Triad) is a syndrome found in female athletes while AMI (Athletic Menstrual Cycle Irregularity) is irregularity of menstrual cycle in athletes. Three examples of Female Athlete Triad are disordered eating, amenorrhea, and osteoporosis. Meanwhile, some examples of Athletic Menstrual Cycle Irregularity are various changes of menstrual cycle from amenorrhea to oligomenorrhea. Not all female athletes experience Female Athlete Triad and Athletic Menstrual Cycle Irregularity. The risk of menstrual cycle irregularity may vary from a female athlete to another. Therefore, menstruation does not influence an athlete's performance as the risk of Female Athlete Triad and Athletic Menstrual Cycle Irregularity can be prevented and the menstruation can occur normally if the athlete stops her heavy training.

**Keyword:** performance, menstruation, athlete's

## INTRODUCTION

Women are special creatures of God who are granted with special characteristics, for example, they face menstruation, pregnancy, and childbirth. These special characteristics distinguish women from men. Ironically, in some cases, the different position between men and women often leads to discrimination toward women.

Kartini is an example of how women in the past were restricted in participating and being involved in many activities. Women were trapped in various strict rules and customs. At that time, they spent more time inside their houses, doing things that do not require much energy such as sewing and embroidering. They were restricted to go out, especially to get proper education. This is what distinguishes the role of women in the past from the role of women in the present.

In 1945-1950, *olahraga* (sport) was known as *gerak badan* (exercise) in Indonesian schools. It included various materials such as games, athletics, and gymnastics. It was also added with military training in senior high schools. Special attention was given to girls as they were to perform *gerak badan*, separately from boys (Husdarta, 2011:55).

## PARTICIPATION

Nowadays, the role of women in sport is considered equal to that of men. Women can participate in games and competitions as men can. The reality is clearly different from the position of women in sport in the ancient times, for example, when they were prohibited to participate in the first Olympic as athletes.

The position of women can now be considered equal to that of men in several aspects, including their position in sport. Women were able to excel in particular sport, proving that their excellence and achievement are not that different from men's. The fact also proves that women's special characteristics (menstruation, pregnancy, and childbirth) do not prevent them

from performing various activities and showing their good performance in achieving remarkable achievements.

Sports achievement can be gained since early age as some sport events are held since this period. Menstruation, which will be definitely faced by women as marker of puberty, is considered both positively and negatively. It is considered negatively due to an opinion that it may hamper sports performance. Women performing heavy sport activities or exercises commonly experience Female Athlete Triad (FAT) and Athletic Menstrual Cycle Irregularity (AMI). However, not all female athletes experience them, and those who have experienced the syndromes, will not face it forever.

Participation of children who started from an early age certainly need to pay attention to the physiological and psychological factors children. The participation of children, especially women at the time of entry at an early age will of course have an influence, because at this age children attend during growth and development. Growth and development in this period will be more rapid if a child is in puberty. Someone children entering at puberty, physiologically and psychologically will experience the difference. Female puberty is marked by the release of menstrual blood.

Menstruation is considered by most people as something that is annoying, but there are some people who deem menstruation as normal and if the woman does not feel intrusive activity. The above background will underlie further studies about how much menstruation influences sports performance, which will be discussed in this article.

## **MENSTRUATION**

Menstruation occurs in women who have gone through puberty and it normally happens every month. According to Bobak, M. & Irene et.al. (2004: 45-47) menstruation is periodic bleeding in the uterus that begins approximately 14 days after ovulation. The first day of menstruation set as the first day of endometrial cycle. The average length of menstrual period and the volume of blood discharged may vary from a person to another. The average length of menstrual flow is five days (with a range of three to six days) and the average amount of discharged blood is 50 ml (with a range of 20 to 50 ml) but this also may vary.

Another definition of menstruation is given by Rustam, M. (1998 : 13 ) who believes that it is a monthly discharge of blood from the womb. The first menstrual period is called menarche. Healthy women who are not pregnant regularly discharge blood through their reproductive organs. Menstruation is also called menses, menstrual period, or period.

In line with Rustam, Hasjim E. (1981: 55) states that menstruation is periodic and cyclic bleeding from the uterus accompanied by the release of endometrium. It occurs due to the simultaneous work of the cerebral cortex, hypothalamus, ovaries, thyroid gland, suprarenal glands, and other glands (Sarwono P., 1982: 65).

From these opinions, it can be concluded that menstruation is periodic bleeding which routinely occurs in women every month. People also call it with the terms menses, menstrual period, or period.

## **MENSTRUAL CYCLE**

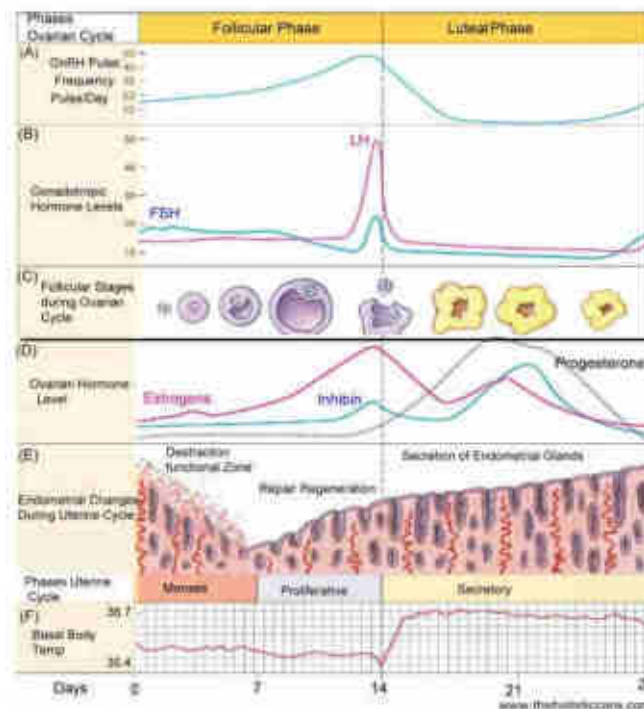
Menstrual cycle is regulated by fluctuating levels of sex hormones which produce certain changes in the ovaries and uterus. The menstrual cycle is influenced by the rise and fall of the sex hormones (estrogen, progesterone, and a little of androgen) which results in some changes in the ovaries and uterus. The menstrual cycle is intended to release the ovum in preparing for fertilization (Hyde, 1982: 77).

Menstruation usually experienced by women before, during, and even after menstruation is usually accompanied by signs or symptoms. The symptoms that accompany it can be physiological, or psychological. Physiological symptoms that usually appear include pelvic pain, abdominal pain, dizziness, acne and tired out. While the psychological symptoms that sometimes arises is easily upset, irritable. All the symptoms that accompany one's performance is influenced by the rise and fall of hormones.

Every month mature human females experience a series of changes which basically involve the hypothalamus of the brain, the anterior lobe of the pituitary gland, the ovaries, and the endometrium. They experience a monthly series of changes influenced by the hypothalamus in the brain, the anterior lobe of the pituitary gland, the ovaries and endometrium. The menstrual cycle is divided into three phases, namely menstrual, post-menstrual, and pre-menstrual while the average adult women have menstrual period which last for 28 days. Adult women are human females who have already gone through puberty. In the menstrual cycle, the endometrium is regularly prepared to receive the fertilized ovum after ovulation, under the influence of ovarian hormones (estrogen and progesterone) (Benjamin A.K., 1990: 354).

According to Sherwood (2001: 716-717) menstrual or menstruation phase is the most obvious phase because it is characterized by the discharge of blood and endometrial debris from the vagina. The menstrual phase lasts five to seven days after the degeneration of the corpus luteum, together with the early form of the ovarian follicle. The level of ovarian hormones such as estrogen and progesterone decreases dramatically when the menstrual phase occurs. The post-menstrual phase is divided into three sub-phases namely early proliferation phase (from the fourth to the seventh day), mid proliferation phase (from the eighth to the tenth day, and late proliferation phase (from the eleventh to the fourteenth day). Meanwhile, the pre-menstrual phase begins after ovulation occurs and lasts from the 14<sup>th</sup> to 28<sup>th</sup> day. This phase is also called the secretion phase which causes the endometrial glands actively secrete glycogen. If fertilization and implantation do not occur, the corpus luteum degenerates and the follicular and menstrual phase re-start.

From these opinions about the menstrual cycle, it can be concluded that it is a series of process consisting of three phases: menstrual phase, post-menstrual phase, and pre-menstrual phase. The average length of menstrual cycle is 28 days.



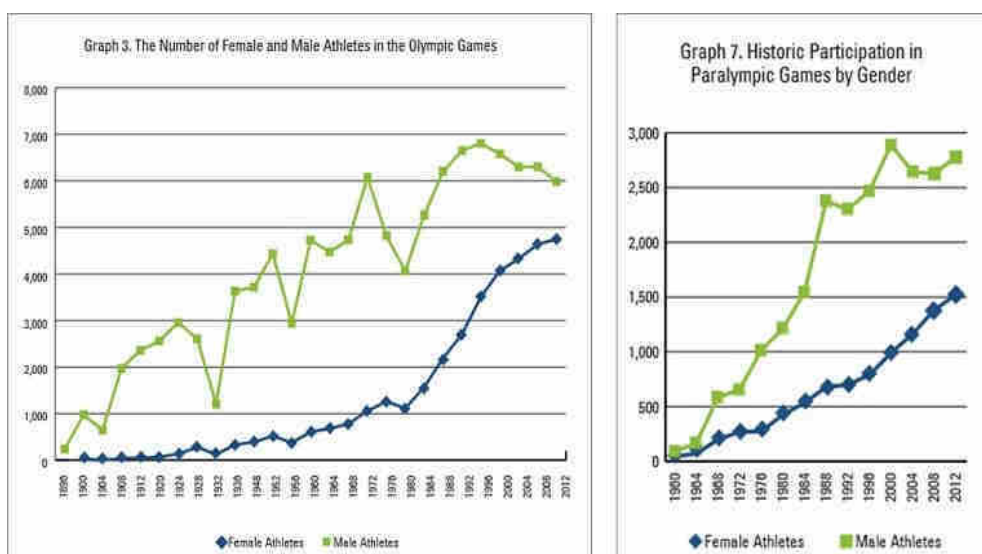
**Figure 1. Menstrual cycle**

([http://www.sandiegomommymaker.com/imgs/img\\_June2010\\_MenstrualCycleGraphic.jpg](http://www.sandiegomommymaker.com/imgs/img_June2010_MenstrualCycleGraphic.jpg))

## MENSTRUATION AND ATHLETE'S PERFORMANCE

The notion that women should not exercise or participate in sport to gain achievement has to be abandoned. Nowadays, the participation of women in sport keeps increasing from time to time. They usually take part in sport as members of fitness clubs or participants in particular sports clubs.

Girls may also participate in sport by joining sports clubs that they want. Their ultimate goal, of course, is to be able to excel in a particular sport. These girls will soon become female athletes who will actively participate in various sport such as sports games (futsal and softball), martial arts (kempo, karate, and taekwondo), and athletics. The increase of women's participation in sport is shown in Figure 2 below.



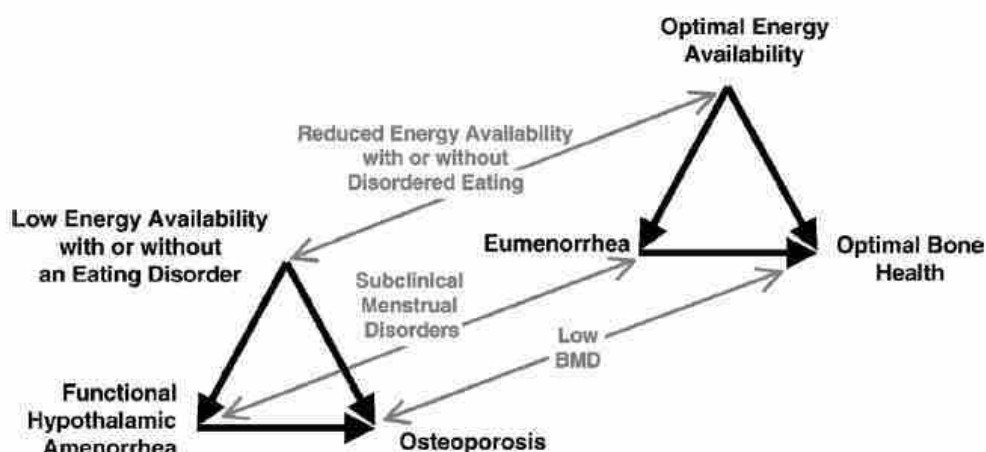
**Figure 2. The chart of the female and male athletes' participation in Olympic Games and Paralympic Games. (K.M Kraft: 2013)**

Women's special characteristics such as menstruation, pregnancy, and childbirth no longer become obstacles for them to join various activities. Although having these characteristics, they can still gain achievements in certain sport. According to Husdarta (2011:105), the past notion that women are physiologically weak is now justified as it does not happen at present. At this time, many female athletes are tall, making them good volleyball or basketball athletes. Meanwhile, they who have good strength and speed are able to be gymnastics or running athletes. The characteristics of athletes who are capable to gain remarkable achievements are: having excellent physical condition, perfectly mastering technique, having psychological and moral characteristics required by the sport, having compatibility with the sport, and having years of training and competing experiences (Husdarta, 2011:75).

Achievement can surely be gained through maximal long-term exercise. The exercise is one of the factors which determine athletes' achievement. It affects the physiological function of the body, for example, menstruation which occurs every month in female athletes. The involvement of the female athletes in sport and heavy exercises will result in the menstrual cycle irregularity, although not all of them experience the syndrome. Female Athlete Triad (FAT) and Athletic Menstrual Cycle Irregularity (AMI) are two syndromes which are related to

the effects of exercise upon menstrual cycle. These syndromes are also closely connected to menstrual cycle and menstrual irregularity.

According to Peter J.A. Rooney B.L. (2003: 25), the Female Athlete Triad (FAT) is a syndrome involving three interrelated disorders: disordered eating, amenorrhea, and osteoporosis. The model of the FAT can be seen in Figure 3. The model shows that the FAT occurs in not all female athletes. Meanwhile, it also shows that the risks caused by heavy exercises are energy deficit (the food intake is not equal to the energy produced). The female athletes with high risk of the FAT in some sports such as gymnastics, ballet, diving, figure skating, aerobics, running, wrestling, rowing, and martial art (ACSM, 2011).



**Figure 3. Female Athlete Triad model**  
([http://www.coach.ca/files/WiC\\_Journal\\_October2011\\_EN\\_1.pdf](http://www.coach.ca/files/WiC_Journal_October2011_EN_1.pdf))

Another syndrome which may threaten female athletes when participating in sport, especially heavy exercises, is Athlete Menstrual Cycle Irregularity (AMI). This syndrome is almost similar to the Female Athlete Triad, as it is closely related to menstruation, especially amenorrhea, the absence of menstruation. The Menstrual Cycle Irregularity is a syndrome in which a serious menstrual cycle dysfunction occurs, either amenorrhea (the cease of menstrual cycle) or oligomenorrhea (menstrual cycle with normal length but not accompanied by ovulation or menstrual cycle with short luteal phase) (Sherwood, L, 2001).

Amenorrhea is related to high-intensity physical activity conducted by female athletes resulting in weight loss caused by disorder of the function of hypothalamus which at the same time, lower the production of estrogen hormone. It is divided into two, namely primary amenorrhea and secondary amenorrhea. A 14-year-old girl suffering from the primary amenorrhea does not experience menstruation yet and does not show any secondary sex characteristic developments. Even, she grows without any secondary sex characteristics although she is already 16 years old. Meanwhile, the secondary amenorrhea is described as the absence of menstruation for six months in women who usually have normal menstrual cycle or for twelve months in women with long menstrual cycle (oligomenorrhea) (Kazis, 2003 in Arofah N, 2014).

Amenorrhea which occurs in the Athlete Menstrual Cycle Irregularity (AMI) is almost similar to the Female Athlete Triad. However, the mechanism of the Athlete Menstrual Cycle Irregularity (AMI) is not yet discovered although many researches show that fast weight loss, body fat percentage loss, food insufficiency, previous menstrual dysfunction, stress when beginning exercises, and exercise intensity are significant factors. The results of some researches show that if a woman begins her heavy exercise before she has her menarche (first menstruation), she will have a delayed menstrual phase. In average, it is known that female athletes who begin heavy exercises before their menarche will have her first menstruation three years later than those begin heavy exercises after their menarche. Like the Female Athlete Triad,

the Athlete Menstrual Cycle Irregularity is marked by changes of hormones, especially hormones which are closely related to reproductive hormones and regulation of hypothalamus. The changes of hormones are (1) very low follicle-stimulating hormone (FSH) level, (2) increase of luteinizing hormone (LH) level, (3) decrease of progesterone in the luteal phase, (4) low estrogen level in the follicle phase, and (5) the environment of FSH/LH which is far compared to that of women of the same age and athletes who begin heavy exercises after their first menstruation (Sherwood, 2001).

Amenorrhea is regulated by hypothalamus. In hypothalamic amenorrhea, the pulsatile gonadotropin releasing hormone (GnRH) is abnormal. Rarely, this can be caused by a tumor or trauma or developmental defect. More commonly, it is thought that psychological and/or physical stress affects neuro-hormones that regulate GnRH, leading to hypothalamic amenorrhea (Marshall, 1994 in Noelte, R., Fieseler, C., 2005). Exercise-related amenorrhea can be considered a subset of hypothalamic amenorrhea, which also includes amenorrhea related to anorexia nervosa, weight loss, and psychological stress. It is, however a diagnosis of exclusion. Pregnancy is the most common cause of amenorrhea in sexually active women, and must be excluded. Other diagnoses to rule out include polycystic ovarian syndrome (PCOS), Asherman's syndrome, and thyroid or pituitary abnormalities (Noelte, R., Fieseler, C., 2005).

According to Arovah N. (2014), the Female Athlete Triad is a syndrome which needs deeper studies and understanding by the female athletes, as it may cause dangerous impacts and even threatens the lives of its sufferers. Syndromes which occur in an athlete when doing her heavy exercises, especially those which are closely related to amenorrhea will not occur in her forever. It can also be stated that the syndromes will cease to occur when she stops her heavy exercise. Moreover, women participating in heavy exercises get not only negative effects but also positive ones. According to Sherwood (1996), a research of which object is a former female athlete, shows that she has less than half of life time risk to suffer from reproductive cancer and half of life time risk to suffer from breast cancer, compared with non-athlete females. These reproductive and breast are hormone-sensitive cancers and the risk reduction is resulted from the delayed menarche. The delayed menarche and the low estrogen level in female athletes allow them to reduce the risk of reproductive and breast cancers.

Menstruation is pending in addition to lead to decreased risk of reproductive system cancers and breast cancer, reduced cancer risk is also influenced by hormones endorphin. Endorphin hormones have the same receptors are located in the hypothalamus and limbic system of the brain. This hormone not only reduces the feeling of pain and give you the strength to face cancer alone, but also increase memory, normalize appetite. The role of the hormone endorphin as a pain suppressant or can be said as morphine, also play a role when a person experiences periods characterized by symptoms of pain before menstruation, during menstruation, or after menstruation. According to its beta- endorphin, among others : (1) endorphine enhance our immune system, (2) endorphins block the lesion of blood vessel, (3) endorphins have anti-aging effects by removing superoxide, (4) endorphine are anti-stress hormones, (5) endorphins have a pain-relieving effect, (6) endorphins help improve your memory ( Siswantoyo , 2007).

Endorphin hormone also has an important role when a person experiences periods characterized by symptoms of pain, this hormone will work to suppress it. By the time a woman doing heavy exercise or activity at the time of performance in sport, the woman is experiencing pain as a symptom of menstruation, the hypothalamus to secrete hormones will work endorphine so that the pain can be reduced, so as not to interfere with the current performance

The menstrual phase disorders, amenorrhea and oligomenorrhea will stop if the sufferer stops doing heavy activities. The disorders can be cured by turning back the physiologic changes which are related to hypothalamic amenorrhea. Another method is by changing the pattern of exercise and nutrition intake regulation. However, if these two methods do not work, some checkups need to be conducted. The checkups examine the FSH, LH, estrogen, and progesterone serum level, thyroid function, testosterone and dehydroepiandrosterone (DHEAS) level. All blood tests should be conducted after 24-hours rest. Meanwhile, the other checkups

which need to be conducted are pelvic ultrasonography, CT-scan cranium or MRI (for checking the probability of primary tumor), and bone density test (conducted if the participant of the heavy exercise experiences long-term amenorrhea or has very low estrogen rate).

Generally menstruation in some women athletes have an influence on performance, especially for the children of women who start a weight training program that begins before their menstruation. Menstruation is a sign of a person enters puberty, the reproductive organs which have started functioning optimally, so that when women participate in sports before puberty, it is possible to affect the performance of the organs of the body. Menstrual Disorders in fact not only experienced by women who participate in vigorous exercise, but women with mild activity also exist who experience menstrual disorders. Actual menstrual disorders can affect anyone, because in addition to heavy activity, the role of hormones affect the menstrual especially reproductive hormones. The hormone is influenced by the setting in operation of the hypothalamus.

More serious attention needs to be paid to female athletes who participate in heavy exercises and experience menstrual disorders such as the Female Athlete Triad and the Athlete Menstrual Cycle Irregularity, especially which is related to amenorrhea and oligomenorrhea. These disorders are much influenced by functional regulation of the hypothalamus, so deeper attention should be paid to this physiologic function. It needs a long time to cure the menstrual disorders. Therapy is one of the methods which can be fruitful if all parties who actively take part in coaching (in this case, athletes, coaches, nutrition experts, and sports doctors) also actively participate in it.

## CONCLUSION

Menstruation is often regarded as something which influences and disturbs female athletes' sports performance. The Female Athlete Triad (FAT) and the Athlete Menstrual Cycle Irregularity (AMI) are two syndromes which accompany and are related to menstrual disorders. The disorders happen if the athletes participate in heavy sports activities, in the forms of amenorrhea and oligomenorrhea. The disorders do not occur forever and they will cease to happen if the athletes stop their heavy exercises. The amenorrhea and oligomenorrhea can also be minimized by conducting a kind of therapy. However, menstruation does not forever disturb sports performance or give negative effects to the athletes. In some cases, heavy exercises and menstrual disorders give positive effects. One of the effects is that the athletes will have low risks of reproductive and breast cancers. Therefore, it can be concluded that sports performance is not always influenced by menstruation. Just the opposite, menstruation does not always disturb the sports performance.

## ACKNOWLEDGMENTS

Sincere gratitude and appreciation are dedicated to the Dean of the Faculty of Sport Sciences, Yogyakarta State University and the committee of the seminar for the opportunities given to the researcher to participate in the 2014 International Seminar of Sport Culture and Achievement.

## REFERENCES

- Arovah, N.I. (2014). *Female Athlete Triad pada Atlet Wanita (Diagnosis, Pencegahan, dan Penatalaksanaan)*. Yogyakarta State University: Staff site of Yogyakarta State University (retrieved in 8 April 2014).
- Benjamin A.K., (1990). Health. New York: Harcourt Brace Javanovich, Publishers.
- Bobak, M & Irene et., al (2004). Keperawatan Maternitas. Edisi 4. Jakarta: EGC
- Coaching Association of Canada. (2011). ISSN 1496-1539. October 2011, Vol. 11, No. 3

- Harber, V. (2011). The Young Female Athlete: Using the Menstrual Cycle as a Navigational Beacon for Healthy Development. *Canadian Journal for Women in Coaching*.
- Hasjim, E (1981). Fisiologi Sistem Hormonal dan Reproduksi Dengan Pathologinya. Bandung: Alumni
- Husdarta. (2011). *Sejarah dan Filsafat Olahraga*. Bandung: Alfabeta.
- K.M Kraft.,(2013). Report Reveals True Picture of Women in The Olympic and Paraolympic Game. *Emergingtechnicalfoul.blogspot.com*
- Nolte R., Fieseler C.M.,(2005). The Female Athlete. McGraw-Hill
- Peters, J.A. & B.L. Rooney. (2003). The prevalence of the female athlete triad among women runners in the Midwest. *Gundersen Lutheran Medical Journal 2: 1*.
- Rustam, M., (1998) Sinapsis Obstetri: Obstetri Fisiologi, Obstetri Patologi. Jakarta: EGC
- Prawiraharjo, S (1982). Ilmu Kandungan. Jakarta: Yayasan Bina Pustaka
- Sherwood L.,(2001). Fisiologi Manusia Dari Sel ke Sistem. Jakarta: EGC
- Siswantoyo.,(2007)). Modulasi Respon Imun Pada Pelaku Olahraga Pernafasan. Surabaya: Program Pascasarjana Universitas Airlangga
- .....(2011). *The Female Athlete Triad*. America: American College of Sports Medicine.
- [http://www.sandiegomommymaker.com/imgs/img\\_June2010\\_MenstrualCycleGraphic.jpg](http://www.sandiegomommymaker.com/imgs/img_June2010_MenstrualCycleGraphic.jpg). (retrieved in 21 March 2014)



# IDENTIFICATION OF HYDRATION STATUS WITH URINE PROFILE MEASUREMENT AND DRINK CONSUMPTION IN PENCAK SILAT ATHLETE IN YOGYAKARTA STATE UNIVERSITY

Inna Rachmawati<sup>1</sup>, Neni Trilusiana Rahmawati<sup>2</sup>, Mirza Hapsari Sakti Titis Penggalih<sup>3</sup>, B.J. Istiti Kandarina<sup>4</sup>

Gadjah Mada University, Indonesia

nadia.hanun.narruti@gmail.com<sup>1</sup>, neni\_med@yahoo.co.id<sup>2</sup>, hapsa@yahoo.com<sup>3</sup>,  
ikandarina@yahoo.com<sup>4</sup>

## Abstract

A martial arts accomplishments still have ups and downs. The ebb and flow of sporting achievement is determined by the athletes themselves, as well as coaches, managers, and official. Therefore, the need for assessment and evaluation to performance in Indonesia can be improved, particularly in the Daerah Istimewa Yogyakarta (DIY). Yogyakarta State University (UNY) is one of the colleges in the DIY which athletes qualify often represent regional and national matches. Athletes of martial arts from UNY is often sent DIY in regional and national championships, but the pass was still a little. Athlete's performance is influenced by several factors, one of which is performance related with nutritional approach. Essential nutritional elements one of which is water that can affect fatigue and performance of athletes if intake is not sufficient. Water enters the body, especially from drink. If the drinks are not sufficient, it will affect an athlete's hydration status. To identify the hydration status in athletes of martial arts, Yogyakarta State University with a profile measurement of urine and frequency of fluids consumption. This research is a descriptive analytical approach to the observational cross-sectional design. Subject of this study is the entire population of martial arts athlete in UNY who met the inclusion criteria measurements drink consumption with food records for 3 days and semi-quantitative food frequency measurements and urine test strips. Hydration status in athletes of martial arts in UNY indicated by a percentage of 85% in subjects with dehydrated urine specific gravity measurements and 52.5% in urine color measurement. The average amount of fluid consumed from beverages by martial arts athletes were  $2051.20 \pm 603.83$  ml. There was no significant relationship between the amount of fluid hydration status. There was no significant relationship between the type of drink with good hydration status based on urine specific gravity and urine color. There was no relationship between the amount of fluid from beverages consumed each day with good hydration status by measurement of urine specific gravity and urine color. Drink consumption on different athletes with ordinary people because a more intensive level of activity that required the consumption of beverages in the settings before, during and after exercise.

**Keywords** : hydration, urine specific gravity, urine color, fluids, beverages

## INTRODUCTION

Indonesia has a wide variety of traditional arts and sports. One of these martial arts are martial arts that need to be maintained existence and sustainability. As a successor or a new generation, the youth of Indonesia should be proud of the traditional martial arts that we have, although there is still much more powerful martial arts and growing more popular in Indonesia.

Pencak Silat is a martial art that belong to the sport. This was evidenced by understanding the sport itself. According Notosoejitno (1997), in terms of language, sport is a human activity for encouraging physical self while maintaining purposeful. Sports in Indonesia

still have ups and downs, including the martial arts sport. For example, when the last SEA Games in 2011, 15 class categories martial arts sparring Indonesian national team that competed, only able to get 8 tickets in the final and won 3 gold medals and 12 gold medals contested by other Vietnamese fighters to Malaysia with 6 gold and 3 gold (Reuters, 2011). Based on the results obtained by the martial arts sport, of course, necessary assessment and evaluation, both of the athletes, coaches, managers, and officials in order to achievement in Indonesian martial arts can be improved, particularly in the Special Region of Yogyakarta (DIY). Athletes of martial arts originating from the "Student City" still needs to be improved performance. As one example, namely the provincial championships, a representative of relatively still quite a bit of DIY. The representative was coming from one of the colleges, namely Yogyakarta State University (UNY). Athletes martial arts is often sent UNY Yogyakarta province diajang provincial and national championships, only athletes who qualify are still little. Therefore, UNY martial arts athletes need to evaluate the factors that may affect achievement in various championships, one of which is performance.

Mahan and Stump (2008 ) states that the success of an athlete's performance is the result of a combination of good genetics, desire, proper exercise, and appropriate nutritional approach. Nutritional approaches that do not fit or are not quite according to Nugroho (2008 ), can cause fatigue and consequently can affect an athlete's achievement. Water is one of the essential nutrients needed by an athlete to maintain its performance. The water goes into the human body of drinks and food, but more dominant water intake from beverages. Entry of water through the consumption of beverages is not enough to aggravate the hydration status of athletes. Hydration status can be divided into three, namely dehydration / hipohidrasi, euhidrasi and overhidrasi / hiperhidrasi. According Almatier (2004 ) dehydration is a condition of excess fluid loss caused by an imbalance between the body fluid excreted by the consumed. Things like that can be said that the dehydration caused by lack of water consumption when the body loses a lot of fluids. Euhidrasi a normal person in a state of dehydration and overhidrasi. While overhidrasi / hiperhidrasi the amount of fluid into the body compared to expenditures. According to Guyton and Hall ( 2011) fluid that enters the body is divided into two, namely the liquid that comes from food and beverages, as well as the result of fluid metabolism. Fluid from beverages, foods, and products of metabolism ( Vander et al., 2001). Fluid from beverages has the greatest contribution of the fluid from foods and products of metabolism. Beverages be the main criterion in the body fluids fulfillment relating to the determination of hydration status.

Consideration to have a good hydration is important is to get optimum exercise performance. Loss of body fluids caused by several factors such as body size, exercise intensity, ambient temperature, humidity, and heat acclimation (Almuktabar, 2009). Dehydration during physical activity is something that often happens unconsciously because fluid intake less than the fluids lost. This happens because of the duration and intensity of exercise itself (Murray, 2007). Dehydration may increase the risk of potentially exposed to life-threatening heat injury such as heat stroke. Therefore, athletes should strive to euhydration before, during, and after exercise. According to The American College of Sports Medicine (2009 ) by holding the position for fluid replacement on exercise perform a comprehensive review on the review and recommendation to maintain hydration before, during and after exercise, therefore, the researcher intends to conduct research on the identification of hydration status beverage consumption in relation to the martial arts athletes in Yogyakarta State University. Through this research will be able to provide information and feedback to athletes and coaches on performance of athletes through beverage consumption and hydration status.

## **MATERIALS AND METHODS**

This research is a descriptive analytic observational study with cross - sectional design, ie observing the hydration status and fluid consumption in martial arts athletes. With a total population of athletes subject martial arts Yogyakarta State University ( UNY ), amounting to 40 people.

Hydration status can be determined from urine samples by collecting urine morning then at that time also performed using a test strip urine dipstick test to determine the specific gravity and urine color. Intake of urine performed for 3 consecutive days. Urine taken from respondents in the morning, then accommodated in the container. The urine sample was directly measured using a dipstick test strips by dipping into a container containing urine and then observing the results with equate the value of the standard tools and the results recorded. Urine sampling will be conducted by researchers and students enumerators 2 Health Nutrition. Measurement of the volume and type of fluid consumed is done by filling a semi-quantitative food frequency questionnaire for 7 days and validated using a food record for 3 days which describes the volume as well as the type of fluid that is often consumed.

## RESULTS AND DISCUSSION

Based on Table 1, UNY martial arts athletes age averaged  $19.83 \pm 2.123$  years old athletes while practicing martial martial arts based on the age of the last data collection averaged  $7.14 \pm 3.621$  years. Table 2 is based on the percentage of subjects whose sex men 65% and women by 35%. Respondents with a national achievement that is 45 % and the percentage of athletes who exercise regularly are 55%.

**Table 1. Silat Description of Age and Older Subjects Research**

Characteristics	n	$\bar{X}_s$	Std.	Minimum	Maksimum
Age	40	19,83 tahun	2,123	17 tahun	26 tahun
Length of silat	40	7,14 tahun	3,621	2 tahun	16 tahun

**Table 2. Characteristics of Research Subjects**

Characteristics	N	%
Gender		
Male	26	65
Female	14	35
Achievement		
Champion city	10	25
Regional	12	30
National	18	45
Physical Exercise		
Routine	22	55
Not Routine	18	45
Total	40	100

From Table 3 shows that the average specific gravity of the urine is  $1.025 \pm 0.005$  with a minimum value of 1,010 and a maximum value of 1.030. Average urine color shown in the table at  $4.325 \pm 1.252$  with a minimum value of 2.33 and a maximum value of 6.67.

**Table 3. Description Urine Specific Gravity and Urine Color**

Variable	n	$\bar{X}_s \pm SD$	Range
Urine specific gravity (g/ml)	40	$1,025 \pm 0,005$	1,010-1,030
Urine colour	40	$4,325 \pm 1,252$	2,33-6,67

From Table 4, hydration status based on the specific gravity of the urine of 40 subjects was 15% in the condition euhidrasi / well hydrated while 85 % dehydrated. Similarly, the color of urine are shown in the table that 47.5 % and 52.5 % experienced euhidrasi dehydrated.

**Table 4. Characteristics of Hydration Status Conditions**

Condition	Urine specific gravity		Urine colour	
	n	%	N	%
Euhydration	6	15	19	47,5
Dehydration	34	85	21	52,5
Total	40	100	40	100

	Urine specific gravity		Urine colour	
Euhydration	$\leq 1.020$		1-4	
Dehydration	$> 1.020$		5-6	

Based on the survey results revealed that the percentage of dehydration in athletes UNY martial arts is 85 % of 40 people, which is about 34 people, both men and women. The percentage is obtained from the number of subjects classified as dehydrated by urine specific gravity. While the percentage of dehydration based on the color of the urine by 52.5 %. The second indicator of hydration status, either based on specific gravity and urine color suggests that the percentage of urine specific gravity followed by the percentage of urine color. The greater the specific gravity of the urine, the higher the degree or urine color density. This is consistent with research conducted Niemann ( 2012) that the color of urine that has a strong correlation with urine specific gravity and urine osmolality. The prevalence of dehydration in athletes is caused by several factors, such as ambient temperature, relative humidity, wind speed, and solar radiation.

From Table 5, it is known that not all variables have a significant relationship with the state of hydration, both based on urine specific gravity and urine color ( $p < 0.05$ ).

**Table 5. Characteristics subject to Hydration Status**

Subject characteristics	Urine specific gravity					Urine colour				
	Euhydrat		Dehydrat		P	Euhydrat		Dehydrat		P
	Ion		Ion			ion		Ion		
	n	%	n	%	N	%	n	%		
Gender										
Male (26)	3	11,5	23	88,5	0,646	10	38,5	16	61,5	0,119
Female (14)	3	21,4	11	78,6		9	64,3	5	35,7	
Physical exercise										
Ruotine (22)	2	9,1	20	90,9	0,381	9	47,4	13	61,9	0,356
No Ruotine (18)	4	28,6	14	71,4		10	55,6	8	44,4	

It is known from the results of research conducted, outside variables such as gender and physical exercise does not have a significant relationship to the condition of dehydration ( $p > 0.05$ ), both based on the specific gravity and urine color. Something similar is found in a study conducted by Oppliger et al. ( 2005) that urine specific gravity and osmolality of urine is not as sensitive as plasma osmolality in affecting change based on percent increase in dehydration weight loss during physical exercise. According Cheuvront (2005) based on the displacement of plasma osmolality of plasma and extracellular fluid volume. When someone sweats, the plasma and extracellular fluid concentration will decrease thus altering blood osmolality. Variable sport or physical exercise does not affect the hydration status by indicator of urine, but blood analysis is sensitive to plasma osmolality caused by spending a lot of body fluid in the form of perspiration

Based on the analysis in Table 6, it is known that there is no correlation between the average fluid intake of beverages with gender, physical exercise and hydration status based on urine specific gravity and urine color.

**Table 6. Differences Average Beverage Consumption of liquid ( mL ) on Each study subject characteristics**

Characteristics	n	$\bar{X}$	Std.	p
Gender				
Male	26	2103,74	585,87	0,597
Female	14	1953,61	646,52	
Physical exercise				
Routine	22	2194,39	512,71	0,067
No Routine	18	1876,17	672,87	
Urine specific gravity				
Euhydration	6	1919,31	770,00	0,948
Dehydration	34	2074,47	580,82	
Urine colour				
Euhydration	19	2078,75	686,02	0,812
Dehydration	21	2026,27	534,34	

The average difference fluid hydration status has no significant relationship. Therefore, the average fluid consumed were unable to describe a person's hydration status. From these results, the consumption of liquid beverages is not enough to meet the needs of an athlete, however most athletes consume fluids from beverages is > 1500 ml per day or above the normal adult needs according to WHO ( Bellego et al., 2010). Such as explanations of Whitney and Rolfes (2008 ) that the fluid intake of drinks at the usual average of about 1500 ml per day. According Katch et al. ( 2011) the average fluid intake of ordinary people in a normal environment was 2500 ml consisting of drinks, food and the result of metabolic processes. So is the difference in average fluid with physical exercise that does not have a significant relationship. However, the average fluid consumed by athletes who regularly perform physical exercise (  $2194.39 \pm 512.71$  ml ) greater than athletes who do not routinely (  $1876.17 \pm 672.87$  ml ). Fluids and drinking needs of each person is different depending on the physical exercise performed, the ambient temperature and thirst regulation by the body. Fluid requirements can be increased five to six times above normal during physical exercise and high temperatures. Fluid needs of athletes during physical exercise, according to Murray (2006 ) before, during and after physical exercise athlete. Fluid requirements of the beverage, either less or excess, all have an effect on the body physiologically. By Tack ( 2010) volume of fluid intake will slightly alter renal function but will increase the risk of kidney stones and urinary tract infections. On the other hand, excessive fluid intake can cause hyponatremia. Excessive fluid consumption ( > 1.5 liters / hour ) during physical exercise can trigger hyponatremia and could potentially be fatal faint.

From Table 7, it is known that the relationship between the average fluid intake of beverages with good hydration status based on urine specific gravity and urine color is not a significant difference (  $p > 0.05$  ).

**Table 7. Relationship with Total Liquid Hydration Status**

Variables	Urine specific gravity					Urine colour				
	Euhydrati on		Dehydrat ion		P	Euhydrat ion		Dehydrat ion		P
	n	%	n	%		n	%	N	%	
Amount of fluids										
<1500 ml/day (8)	2	25	6	75	0,58	4	50	4	50	1,00
≥1500 ml/day (32)	4	3,1	28	96,9		15	46,9	17	53,1	

Based on the research showed that the amount of fluid from beverages consumed by athletes UNY martial arts every day does not have a significant relationship with good hydration status by measurement of urine specific gravity and urine color. In measuring the specific gravity of the urine fluid intake p -value = 0.580 (  $p > 0.05$  ), as well as in urine color parameter measurements using p -value = 1.000 (  $p > 0.05$  ) thus obtained is not significant difference regarding the amount of consumption fluid from beverages among athletes who suffered dehydration euhidrasi with athletes. The absence of a relationship between the average fluid intake of beverages, both with urine specific gravity and urine color may occur due to differences in the sensitivity of the thirst mechanism in each athlete ( Osterberg et al., 2009). Once dehydration, thirst sensation when the emergence of late have started to decrease body fluid and dehydration may reach 2 % to 3 % of body mass before an increase in plasma osmolality stimulates the thirst mechanism ( Adolph et al., 1954 and Greenleaf, 1991). The amount of fluid consumed by athletes also varies according to the intensity of exercise, the sensation of thirst and ambient temperature. The longer the intensity and frequency of the more frequent physical exercise undertaken by the athletes, it will be the more fluid is consumed by athletes. In addition to the consumption of liquid beverages, the consumption of liquid foods also affect the amount of fluid that enters the body.

**Table 8. Type of beverage consumed by athletes Pencak Silat UNY**

Beverages	n	%
Water		
<1500 ml/hari	22	55
≥1500 ml/hari	18	45
Milk		
Yes	32	80
No	8	20
Fruit drinks		
Yes	27	67,5
No	13	32,5
Isotonic		
Yes	10	25
No	30	75
Refreshment drinks		
Yes	38	95
No	2	5
Carbonated drinks		
Yes	8	20
No	32	80
Alcohol		
Yes	0	0
No	40	100
Total	40	100

In accordance with the results of the study, by 55 % or the majority of martial arts athletes have a habit to consume water or mineral water < 1500 ml. In addition to water and mineral water, the researchers also looked at the consumption of other beverages that taste and color. Most martial arts athletes consume beverages such as tea, coffee and energy drinks that are refreshing, namely, the percentage is 95 %. Beverages are often consumed by the subject rather than plain water or mineral water is suspected as a subject also enjoy drinks that taste sweeter than the bland drinks such as mineral water and water for sugar-sweetened beverages would provide energy when consumed. Other drinks are often consumed by athletes of martial arts are milk and other dairy beverages with a percentage of 80 %. Then the group of fruit drinks and processed, known for 67.5 % of the subjects who eat them. There is also a martial arts athletes who consume isotonic drinks, which is the percentage of 25% and 20% carbonated beverages.

According to data obtained from the study, the type of beverage consumed by athletes of martial arts is still not able to function as a rehydration drink. Shirreffs ( 2003) describes in his research that serves as a rehydration drink is a drink that has a composition of carbohydrates and electrolytes ( sodium and potassium ) in it, as in sports drinks. Carbohydrates in the form of simple sugars added to sports drinks as an energy source and can delay gastric emptiness. Sodium in sports drinks can stimulate the absorption of sugar in the small intestine and replace salts lost through sweat. Other electrolytes such as potassium, with sodium ions serve to balance the intracellular fluid.

Based on Tables 9 and 10, it is known that both types of drink water, milk, fruit drinks, isotonic drinks, beverages, carbonated beverages, and alcoholic beverages do not have a significant relationship with the state of hydration.

**Table 9. Relationships with Condition Type Hydration Drinks In Urine Specific Gravity**

Variables	Urine specific gravity				P
	Euhydration		Dehydration		
	n	%	n	%	
Water					
<1500 ml/hari (22)	3	13,6	19	86,4	1,000
≥1500 ml/hari (18)	3	16,7	15	83,3	
Milk					
Yes (32)	6	18,2	26	81,3	0,318
No (8)	0	0	8	100	
Fruit drinks					
Yes (27)	5	18,5	22	81,5	0,643
No (13)	1	7,7	12	92,3	
Isotonic					
Yes (10)	1	10	9	90	1,000
No (30)	5	16,7	25	83,3	
Refreshment drinks					
Yes (38)	5	13,2	33	86,8	0,281
No (2)	1	50	1	50	
Carbonated drinks					
Yes (2)	2	25	6	75	0,580
No (38)	4	12,5	28	87,5	

**Table 10. Relationships with Condition Type Hydration Drinks In Urine Color**

Variabel	Warna urin				P
	Euhydration		Dehydration		
	n	%	n	%	
Water					
<1500 ml/hari (22)	12	54,5	10	45,5	0,324
≥1500 ml/hari (18)	7	38,9	11	61,1	
Milk					
Yes (32)	15	46,9	17	53,1	1,000
No (8)	4	50,0	4	50,0	
Fruit drinks					
Yes (27)	15	55,6	12	44,4	0,141
No (13)	4	30,8	9	69,2	
Isotonic					
Yes (10)	5	50,0	5	50,0	1,000
No (30)	14	46,7	16	53,3	
Refreshment drinks					
Yes (38)	17	44,7	21	55,3	0,219
No (2)	2	100	0	0	
Carbonated drinks					
Yes (2)	4	50,0	4	50,0	1,000
No (38)	15	46,9	17	53,1	

Based on this research, it is known that from the list of types of beverages consumed by athletes of martial arts that has no significant relation to the hydration status by urine specific gravity and urine color. This can be seen from the results of statistical analysis done of all p values > 0.05. In this study, water or mineral water is often consumed by athletes of martial arts do not give a significant impact on hydration status based on urine specific gravity. Casa et al. ( 2000) revealed that water or mineral water merely to relieve thirst as a result of dehydration symptoms. Based on research Silva et al. ( 2010) fluid replacement can affect the specific gravity of the urine is a drink containing carbohydrates and electrolytes. He revealed that the replacement of body fluids by the drink can effectively lower the urine specific gravity < 1.020 g / mL both in men and women. Commercial sports drinks that are on the market, according to Shirreffs et al. ( 2007) contains carbohydrates ( glucose ) 60 g / L, sodium 23 mmol / L, potassium 2 mmol / L, chloride 1 mmol / L with an osmolality of 283 mosmol / kg. If sweat is lost is replaced by consumption of water or mineral water, plasma will experience dilution that resulted in low plasma sodium. However, to replace the loss of salt along with sweat, sodium is added to the fluid replacement drink. Unlike the studies conducted, that the consumption of beverages and isotonic electrolyte does not significantly related to the hydration status by urine specific gravity. This can occur because not all martial arts athletes who consume isotonic drinks and electrolyte, which is only 25%, in addition to that they also do not eat them every day routine as a substitute for proper fluid. Based on that, the difference between athletes who had euhydrasi and dehydrated in isotonic beverage consumption and electrolyte are not visible. According to Hill (2006), fluid absorption from isotonic drinks containing carbohydrates and electrolytes almost six to 10 times greater than regular water. This can happen because the water absorption is very dependent on the movement of sodium in the luminal cells in the small intestine. Sodium is pumped into the intracellular space and produce a high concentration areas with a high osmotic pressure anyway. This affects the movement of water from the cells into the lumen toward the lateral space. This movement reached as a result of hydrostatic pressure and water flowed into the interior of the intestinal villi to be taken by the capillary network.



In addition to isotonic drinks or sports drinks, according to other research Shirreffs et al. ( 2007) that milk is an effective solution to restore the state of dehydration because it contains electrolytes similar to sports drinks. Milk can be consumed as a drink rehydration after exercise, except for those with lactose intolerance.

Other types of beverages such as soft drinks / sodas and fruit juices contain carbohydrates in the form of glucose in concentrations high enough when compared to sports drinks. However beverage with glucose levels high enough that little or no sodium that functions as described above (Shirreffs, 2003). In beverages containing caffeine, according to Armstrong (2002 ) can increase fluid loss through urine. According to Gonzalez - Alonso et al. ( 1992) beverages containing caffeine are not recommended for consumption as a rehydration beverage because it is a diuretic. In addition to beverages that contain caffeine, according to the explanation of the theory of Wen et al. ( 1992) and Mills et al. ( 2001), alcohol consumption significantly in athletes diuretic effect, namely an increase in urine output and lead to electrolyte imbalances and various gastrointestinal disorders ( Swift and Dena, 1998).

## **CONCLUSION AND RECOMENDATION**

The percentage of dehydration in athletes martial arts at the State University of Yogyakarta based on urine specific gravity is 85 % and the color of urine was 52.5 %. Average fluid intake from beverages in martial arts athletes in University of Yogyakarta was 2051.20 ml per day. Type of beverage consumed by most athletes in the martial arts is a Yogyakarta State University water or mineral water with a volume of < 1500 ml ( 55 % ) and fresheners ( 95 % ) every day. There was no significant relationship between the amount of fluid intake from beverages with hydration status in martial arts athletes (  $p > 0.05$  ). No single type of beverage that has a significant relationship with hydration status (  $p > 0.05$  ).

As a martial arts athlete, how necessary and important change drinking habits, such as by increasing your fluid intake. This is because in the study only compared to the needs of a normal adult ( 1500 ml ), whereas the athlete needs more given the level of exercise intensity and high frequency. In times of exercise, athletes are encouraged to consume fluids ( sports drinks ) before ( 400-600 ml ), during exercise ( 150-350 ml every 15 to 20 minutes ) and after exercise ( 450-675 ml of water per 50 grams of weight loss ). do education on the choice of beverage that serves as a rehydration drink for athletes of martial arts. Further research needs to be conducted on the effectiveness of various types of beverages affect the hydration status of athletes in martial arts and the fluid intake comes from foods consumed each day by the martial arts athlete.

## **ACKNOWLEDGEMENTS**

This research was funded by the Lecturer Student Collaboration Grant with funded by grants BOPTN LPPM and Nutrition Lecturer Grant of Medical Faculty UGM. This research was made possible through the support of Mr. Awan Hariono, M.Or; Regional Board Indonesian Pencak Silat Association Special Region of Yogyakarta (PENGDA IPSI DIY); Pencak Silat Student Activity Unit, State University of Yogyakarta; and the Sport and Performance Laboratory Faculty of Sports Science, Sport Faculty Yogyakarta State University.

## **REFERENCES**

- EF Adolph, JP Barker, PA Hoy. ( 1954) Multiple Factors in Thirst. Am J Physiol, 178 :538-562.
- Almatsier, Sunita. (2004 ) Principles of Nutritional Sciences. Jakarta : PT Gramedia Pustaka Utama.
- Almuktabar, Neng Tine Kartinah. ( 2009 ) Perspective of Physiology One moment Dehydration Fatigue Analysis. Journal of Sports Science. Vol. 11, No.. 2, It. 94-108

- American College of Sports Medicine. (2009 ) Nutrition and Performance of Athletic.  
American Dietetic Association, Dietitians of Canada.
- Armstrong, Lawrence E. ( 2000) Performing in Extreme Environments. United States :  
Human Kinetics.
- Armstrong L.E. ( 2002) Caffeine, Body Fluid - Electrolyte Balance, and Exercise  
Performance. *Int J Sport Nutr Exerc Metab*, 12:189-206.
- Armstrong, Lawrence E. ( 2005) Hydration Assessment Techniques. *Rev. Nutr.* 63 (6 Pt 2)  
: S40 - 54
- Armstrong LE, Soto JA, Hacker Jr.FT, Casa DJ, Kavouras SA & Maresh C.M. (1998 )  
Urinary Indices during Dehydration, Exercise, and Moist. *Int. J. Sport Nutr.* 8, 345-  
355
- Bellego, LL, Jean, C., Jimenez, L., Magnani, C., Tang, W., and Boutrolle, I. ( 2010)  
Understanding Fluid Consumption Patterns to Improve Healthy Hydration. *Today  
Nutr*, 45 ( 6S ) S22 - 26
- Casa, Douglas J., Arsmtrong, Lawrence E., Hillman, Susan K., Montain, Scott J., Reiff,  
Ralph V., Rich, Brent SE, Roberts, William O., Stone, Jennifer A. ( 2000) National  
Athletic Trainers ' Association Position statement : Fluid Replacement for Athletes.  
*Journal of Athletic Training* 35 ( 2 ) : 212-224
- Cheuvront, S.N. SMN. ( 2005) Hydration Assessment of Athletes. *Sports Science  
Exchange*.18 ( 2 ) Coombes, J.S. and Hamilton K.L. ( 2000) The Effectiveness of Sports  
Drinks Available commercially. *Sports Med* 29 ( 3 ) : p. 181-209.
- Convertino, V., Armstrong, L., Coyle, E., Mack, G., Sawka, M, Senay, L. and Sherman, W.  
(1996 ). American College of Sports Medicine position stand : exercise and fluid  
replacement. *Medicine and Science in Sports and Exercise*, 28, i - vii.
- Frizzell RT, Lang GH, Lowance DC, and Lathan R. (1986 ) Hyponatremia and  
Ultramarathon Running. *JAMA* ; 225:772 Gonzalez - Alonso J, Heaps CL, Coyle EF. (   
1992) Rehydration After Exercise with Common Beverages and Water. *Int J Sports  
Med*, 13:399-406.
- Guyton, Arthur C. & Hall, John E. ( 2011) Textbook of Medical Physiology Twelfth  
Edition. Philadelphia : Saunders Elsevier Hariono, Cloud. (2006 ) Method of Physical  
Training Pencak Silat. London: Department Faculty of Sport Coaching Education,  
Yogyakarta State University.
- Hill, Rebecca J., Bluck, Leslie JC, Davies, Peter SW (2006 ) The Ability of Three  
commercially Hydration Available Sports Drinks and Water. *Journal of Science and  
Medicine in Sport* (2008 ) 11, 116-123 Compass. ( 2011) Information Medals SEA  
Games in 2011. [ Internet ]. Available in  
[http://www.seagames2011.terbaru.asia/informasi-perolehan-medali-sea-games-  
2011.html](http://www.seagames2011.terbaru.asia/informasi-perolehan-medali-sea-games-2011.html) accessed on February 25, 2012
- Mahan, LK & Stump, SE (2008 ) Krause 's Food and Nutrition Therapy 12th edition.  
USA : Elseviere.

- Maughan, R.J. ( 2000) Nutrition in Sport. The Encyclopedia of Sports Medicine. Vol VII, Page 226.
- Maughan RJ and Griffin J. ( 2003) A Review : Caffeine ingestion and Fluid Balance. J Hum Nutr Diet, 16:411-420
- Mills KC, Spruill SE, Kanne R.W. (2001 ) The Influence of stimulants, sedatives, and Fatigue on Tunnel Vision : Risk Factors for Driving and Piloting. Hum Fac, 43:310-327. Murray, R. (2006 ) Sports Nutrition A Practice Manual for Professionals 4th Edition. Washington : American Dietetic Association.
- Murray, Bob. ( 2007) Hydration and Physical Performance. Journal of the American College of Nutrition. Vol. 26, No.. 5, p. 5428-5478.
- Niemann, Andrew. ( 2012) A Thesis : The Effect of Instrument Type on the Measure of Hydration Status. The College of Graduate and Professional Studies Department of Applied Medicine and Rehabilitation, Indiana State University.
- Notosoejitno. (1997 ) Khasanah Pencak Silat. Jakarta : CV Sagung Seto.
- Nugroho, Sigit. (2008 ) Nutrition For Olahragwan. MEDIKORA Sports Health Journal. London: Nikken UNY.
- Oppliger, RA, Magnes, SA, Popowski, LA, and Gisolfi CV ( 2005) Accuracy of Urine Specific Gravity and osmolality as Indicators of Hydration Status. Int J Sport Nutr Exerc Metab.15 (3) :236-251
- Osterberg, Kristin L., Horswill, Craig A., and Baker, Lindsay B. ( 2009) Pregame Urine Specific Gravity and Fluid Intake by the National Basketball Association Players During Competition. Journal of Athletic Training, 44 (1) :53-57
- Shirreffs, B.C. ( 2003) The Optimal Sport Drink. Schweizerische Zeitschrift für, 51 ( 1 ), 25-29.
- Shirreffs, S.M, Watson, P. and Maughan, R.J. ( 2007) An Milk as an Effective Post – Exercise Rehydration Drink. British Journal of Nutrition, 98, 173-180.
- Silva, Rafael P., Mundel, Toby, Altoe, Janaina L., Saldanha, Monica R., Ferreira, G. Fabricia, Marins, Joao CB ( 2010). Preexercise Urine Specific Gravity and Fluid Intake During One - hour Running in a thermoneutral Environment - A Randomized Cross – over Study. Journal of Sports Science and Medicine 29, 464-471
- Swift, R., Dena, D. (1998 ) Alcohol Hangover ( Mechanism and mediators ). Alcohol and Reasearch World, Vol 22, No 1, p 54-60
- Tack, Ivan. ( 2010) Effects of Water Consumption on Kidney Function and excretion. Nutr Today. 45 ( 6S ) : S37 - S40
- Vander, Arthur, Sherman, James & Luciano, Dorothy. ( 2001) Human Physiology : The Mechanisms of Body Function Eight Edition. New York : The McGraw - Hills Companies.
- Wen SF, Parthasarathy R, Iliopoulos O, Oberley TD. ( 1992) Acute Renal Failure

Following Binge Drinking and Drugs Nonsteroidal Antiin - flammatory. Am J Kidney Dis, 20:281-285

Whitney, E.N., Rolfes, S.R. (2008 ) Understanding Nutrition. USA : Thomson Wadsworth.

# MODEL OF MENTAL TRAINING FOR SWIMMING ATHLETES

Juriana

Jakarta State University, Indonesia  
yanafik@yahoo.com

## Abstract

Mental training has not been done specifically by coach to accompany physical training in athletes over the years. Whereas mental training in sport should be considered as important as physical training. Mental training interventions conducted in this study seeks to contribute to the development of sport especially for swimming athletes. Swimming is a sport that has always competed at every multi-event sports activities. Swimming is also a sport that has the highest number of contested, so be a sport with huge potential to earn as many medals. This study uses three stages of mental training that should be done by a psychologist or a sport psychology consultant, namely: education phase, the acquisition phase, and training phase. The results of the different test statistics with Wilcoxon signed rank test, showed that the change in sport-confidence scores of subject before and after the intervention was significant with a significance value of  $t = 0.018 < 0.05$ . Sport-confidence score after mental training is higher than the score of sport-confidence before mental training given.

**Keywords:** mental training, swimming athletes

## INTRODUCTION

### Background

Mental training has not been done specifically by coach to accompany physical training in athletes over the years. Whereas mental training in sport should be considered as important as physical training (Gunarsa, Soekasah, Satiadarma, 1986). Swimming is a sport that has always competed on any multi-event sports activities. Swimming is also a sport that has the highest number of contested, so be a sport with huge potential to earn as many medals.

According to Goldsmith (2011), the swimming competition is not just fast, but how to maintain physical abilities and techniques in a state of distress, pain, and fatigue. In these conditions, it is important to unite the body and, and mental training play a role in it.

Broadly speaking, the notion of mental include thoughts, views, images and so on which in essence is the empowerment of thinking as a function of the controlling body for action and response (Nasution, 2010). Koruc (2004) states that the mental is a skill. Therefore, the mental can be trained and developed. The term is often used in psychological skills translates is as mental skills.

According Gunarsa, Soekasah, and Satiadarma (1996), mental training is defined as : "A systematic, regular and longterm training to detect and develop resources and to learn to control performance, behavior, emotions moods attitudes strategies and bodily processes".

The goal of a mental training that an athlete can control the mind, emotions, and behavior to better as long as he displays his sports performance. Furthermore, experts said that mental training intended to allow athletes to have mental toughness, which is unwavering stance to achieve the goal despite being under pressure (Loehr, 1982). Mental training also makes athletes have a strategy and orientation directs to have mental toughness (Middleton, Marsh, Martin, Richards, and Perry, 2001). Thus the athlete can perform well in every game and can achieve better performance than before.

Research of Berukof and Hill (2010) on Hispanic students swimmer, showed that self-efficacy has a positive correlation of 0.75 for performance. In the field of sports, athletes with low confidence will more easily perceive social influence as something negative that inhibit

optimal performance. In other words, if athletes do not feel confident, then the optimal performance will be more difficult to achieve.

Bhamri, Dhillon, and Sahni (2005) has conducted research of psychological intervention on a number of table tennis players aged 12-17 years. Some mental training are given to determine the form of mental training which has the highest effect on the mental endurance athletes. The results showed that athletes were given relaxation training and mental imagery showed an increased resistance of the most high, one of which an increase in confidence.

Various studies have shown that effective imagery training to improve performance, although the effect is indirect. The results found that the imagery is consistently successful in increasing self-efficacy, and ultimately improve performance (Howe, 1991).

One of the successful mental training demonstrated on case studies of world swimmer, Marilyn King. King is a world champion that is capable of achieving back by doing visualization training. In 1979 he suffered an injury that could not walk for months. During the period of rehabilitation and untraining of swimming, he was watching a movie how athletes break the world record, and then visualizing by himself. After recovering and returning to practice, he was able to be in 2nd place in the Olympic qualifiers and eventually won a gold medal at the 1980 Olympics (Townsend, 2005).

Michael Phelps is an American world swimmer are always doing relaxation and visualization training before competing. The mental training helped him feel the movements and perfect swimming speed when he had actually been in the competition swimming pool. Swimmer of butterfly specialization style became the most gold medalist in swimming during the Olympics, as many as 16 medals (Townsend, 2005).

According to Weinberg and Gould (1995), stages or phases of mental training is divided into three, namely :

1. Phase of education

This stage is the stage of giving an explanation of the mental exercises, so that athletes feel familiar to mental skills. This stage is also intended to make athletes aware of the importance of studying the mental training. At this stage can be preceded by a discussion of the importance of mental, how many times mental training have been conducted so far, as well as examples of cases that occur in sports .

2. Phase of acquisition

This stage focuses on strategy and technical execution . This phase was conducted to determine the uniqueness or the condition of each individual . At this stage , expected to know how an individual 's ability and what the needs . Some forms of assessment can be done at this stage.

3. Phase of Training

This stage is the final stage or stages of the training itself. This stage has several objectives, namely : achieving automation, integration of teaching psychological skills to the situation or movement, and simulate the situation of competition .

According Vealey (in Weinberg and Gould, 1995), psychological or mental skill that can be developed through education and training methods there are four, namely:

- a) Goal-setting

Goal-setting is the basic of a mental training exercise. Goal setting needs to be done so that the athletes have a direction to achieve. The target can be either long-term goals, medium, and short-term (Nasution, 2009).

According to Nasution (2009), there are three conditions that need to be kept in mind that the goal is worthwhile, namely: 1) the target should be challenging, targets that set should be created so that athletes feel challenged to be able to achieve these goals; 2) the target can be achieved, make the target high enough but not too high, the athlete must feel that the goals that set can be achieved if he tried hard; 3) the target should be increased, ranging from relatively low target, then the target is made higher and higher, making it more difficult to achieve if the athlete does not train hard.

b) Physical Relaxation

Other forms of mental training is relaxation. Relaxation is an important procedure in a program of mental training. Relaxation is also the beginning of the procedure that must be implemented in a program of mental training (Weinberg and Gould, 1995). This is because the more a person's state of relaxation makes him more to focus.

Relaxation is used in this research is the basic of progressive muscle relaxation. Relaxation procedure was first introduced by Lazarus and Paul (Goldfried and Davidson, 1976). Then developed by Jacobson to help athletes cope with stress and anxiety (Deputy of Sports Performance Improvement, 2011). The aim is that the athlete can control the pressure in each of the major muscle groups in the body. Muscles that trained are muscle arms, face, neck, shoulders, abdomen, and legs (Rushal, 2008). Before doing progressive relaxation exercises, taught how slow breathing, which in this study uses the ratio of breathing. Athletes are asked breathed in two slow counts, hold your breath on two counts, exhale to a count of four, and repeat this process for ten breathing (Deputy of Sports Performance Improvement, 2011).

c) Thought / attention Control

Concentration is a situation where a person of consciousness focused on a specific object in a specific time (Nasution, 2009). While Weinberg and Gould (1995) limits the concentration as: 1) a person's ability to concentrate or focus on certain cues appropriate to their duties; and 2) maintaining the focus of attention.

Gauron in Satiadarma (2000) states that to start this exercise the athlete needs to be somewhere quiet, no interruptions, are in a sitting position, half-reclining or lying in a relaxed state with eyes closed. Then the athlete is directed to perform some of the steps used in this study:

- Focus on your breathing. Athletes are asked to focus on breathing. At first he was asked to practice breathing regularly and gradually he was trained to draw a deep breath with a slower tempo and exhale as long as possible with a slow tempo as well.
- Focus on the sensation ketubuhan. Athletes are required to guard against the location and position of the body at any given moment. For example, athletes were asked to feel the thickness of the seat cushion where she sat; He also asked her to feel the slope at a given position.
- Exercise. Finally, after the athlete was asked to open the eyes, then asked to focus on a particular object in the exercise room. He was asked to focus on the object, changing its concentration in peripheral vision and binocular vision. Peripheral vision is to capture share of the stimulus other than the object of concentration; binocular vision is to concentrate fully on such objects through binoculars to see it.

d) Imagery or Visualization

Imagery or visualization is a form of mental creation conscious and deliberate and intended to form a perception of something by forming a creative imagination in the mind of the person (Fanning, 1988). Through this creative mental process, one can change the perception of something as he formed an image of the state in different frames of perception, or seeing a particular situation from various perspectives.

In the concept of mental training in sports , visualization is also often referred to as mental rehearsal or imagery also process (Porter and Foster, 1990, p.17). Porter and Foster stated: "The reason visualization/imagery works is ... you are physiologically creating neural patterns in your brain, just as if your body had done the activity. These patterns are like small tracks engraved in the brain cells. It has been demonstrated that athletes who have never performed a certain routine or can move after a few weeks of specific visualization perform the move. As in the physical practice, mental practice makes perfect too".

Visualization is used in this study was guided visualization, which basically combines receptive and programmed visualization. Visualization receptive is to direct individuals to explore the unconscious nature. While programmed visualization is to direct someone to act towards a certain target and improve the performance (Fanning in Satiadarma, 2006). Because considering that visualization involves cognitive processes, then in this study was also conducted intelligence tests using scale of CFIT 3A.

The role of the coach is very important to maximize the athlete's performance . The coach also has an important role in mental training, because the coach who meet everyday with the athletes. However, a sport psychology consultant should explain to the coach about the first principles and philosophy of mental exercise.

According Satiadarma (2000) , the preparation of a mental training program should still be submitted to the sports psychologist, but the implementation can be done by the coaches after they obtain special training to do psychological skills training. So in this case, the coach acts as administrative personnel conducting the training activities and report the results to the psychologist who is responsible for the training program.

The various time needed for mental training, approximately 10-15 minutes for the first, performed 3-5 times in a week in the training session. Mental rehearsal is a process, and ideally continued as long as the athletes doing sport exercise (Weinberg and Gould, 1995).

### **Formulation of The Problem**

What kind of model of the mental training which is used three mental training phases (phase of education, phase of acquisition, and phase of training)? How far that it can be effect on confidence and performance of the swimming athletes?

### **Goal and Benefit of The Reasearch**

Mental training interventions that conducted in this study seeks to contribute to the development of sport in particular in order to make a model of mental training for swimmer. Also the purpose of this study was to determine the effectiveness of interventions such as the provision of mental training to improve confidence of the swimming athltes.

## **RESEARCH METHOD**

This study is a qualitative study with the design research of before and after treatment. According to Stelter (2003), a qualitative approach is the correct method to be developed as a new approach in sport and exercise psychology. This is because the experience involves activities such as athlete's body and are highly individualized (individual differences).

The population was twelve swimmer of Ragunan's School, while the sample is seven people who are eligible to be sampled who have the unoptimal performance during a competition (based on information from the coach) and who have low confidence (based on questionnaire scores of States Sport-Confidence Inventory).

The main data collection in this study was done by interview. While additional data is done by using measuring instruments or sport-confidence questionnaire. The data analysis technique based on the data collected. Qualitative data processing or an interview done by making the categorization answers of the subjects. While quantitative data processing is done by testing the validity and reliability of sport-confidence questionnaire. Validity indicates the level of accuracy and precision measuring instruments perform a measuring function. While reliability indicates the extent of reliable measuring devices (Azwar, 1992).



## RESEARCH RESULTS AND DISCUSSION

- a) Phase of Education, consist of 2 sessions @ one hour.

Purpose:

Provides insight to athletes of mental training, benefits, and its application in sport.

Process overview:

Athletes that invited asked for first questions about mental training to find out how much knowledge and understanding possessed. Then given an explanation of mental training, mental training benefits, and its application in sport.

Standar Measure of Success:

Athletes aware of the importance of mental training s and athletes are willing to follow the next stages of mental training.

In general, research on the phase of education was considered successful because it can motivate and encourage willingness seven of seven swimmers who meet the criteria asthe research subjects to follow the next stage.

- b) Acquisition Phase , consist of 2 sessions @ one hour.

Purpose

Obtain baseline data on the condition and capabilities owned by athletes before intervention

Process overview:

The researchers interviewed the athletes to possessed their mental abilities. Interviews were conducted by using the general guidelines that contain aspects of mental training and sport-confidence. Furthermore, additional data collection conducted by sport-confidence questionnaire or SSCI (Sport Confidence Inventory States) and intelligence tests CFIT 3A.

Standard Measure of Success: Athletes cooperative answering interview questions and earnestly to fill out questionnaires and tests were given.

In the acquisition phase, the researcher identified four mental skills possessed seven swimmers that include the ability to: goal-setting, relaxation, concentration, and visualization. All swimmers have the mental skills and is quite less. This shows at once into consideration that interventions should include four mental skills techniques, namely: goal-setting, relaxation, concentration, and visualization. In the acquisition phase is also used intelligence tests using Scale of CFIT-3A. The results showed that IQ of the swimmers ranged from 93-106 (average). It is a consideration that mental training may not have problems, especially training that require visualization of cognitive processes.

- c) Training Phase, consist of 28 sessions.  
(2 sessions @ one hour and 26 sessions @10-15 minutes).

Purpose:

To train the mental abilities of athletes, which consists of the ability determine the target (goal-setting), the ability of relaxation, ability to concentrate, and visualization capabilities. Process overview: In goal-setting training, athletes are given the opportunity write target twice (before and after the explanation of the explanation of goal-setting).

Furthermore, researchers with the assistance and cooperation with the trainer the next implementing a series of mental training, namely: relaxation exercises, concentration, and visualization. This mental training carried out before or after the physical training.

The results of the implementation of the intervention program is divided into three, namely: 1) changes in athletes' mental skills before and after the intervention; 2) changes in the level of athletes' confidence before and after the intervention; and 3) changes in record time.

- Changes in Athletes' Mental Skills :

After training, six of the seven swimmers increased goal-setting skills. Swimmer G is a swimmer who stil lack in goal-setting skills. In addition, seven of seven swimmers have

increased at three other mental skill, namely : relaxation , concentration , and visualization.

- Change in Athletes' Confidence Level :

Changes in the level of athletes' confidence in this study in terms of three- dimensional of sport-confidence, namely : the dimensions of training and physical skills, the dimension of cognitive efficiency, and the dimension of resilience.

Judging from the dimensions of training and physical skills, six of the seven swimmers confident with their training and physical skills possessed. Swimmer G is a swimmer who has not been convinced by the technique possessed .

Increased the the dimension of cognitive efficiency is quite varied. It is most notable that seven of seven swimmers already feel confident to achieve the specified targets themselves. In addition, only four of the seven swimmers who are able to regulate the speed of swimming.

Increased the dimension of resilience is also quite varied as the second dimension. It is most notable that seven of seven swimmers have felt confident of being able to compete with an opponent during a competition. However, only two of the seven swimmers who believes that he is able to compete under pressure.

The results of the different test statistics with Wiilcoxon signed rank test, showed that the scores change in athletes' sport-confidence before and after the intervention was significant with a significance value of  $t = 0.018 < 0.05$ . Based on sport-confidence questionnaire, it is known that there is the change of sport-confidence level before and after the intervention. Sport-confidence scores after the intervention was higher than the score before the intervention.

- Change in Athletes' Best time :

Based on the results of the National Swimming Championships in May 2012, it is known that after mental training two athletes had improvement in their prime best-time, three athletes had improved their second best-time, and two athletes have not managed to fix their best-time. However, all athletes admitted that they are more comfortable when doing the competition after mental training. Swimmers feel more energetic but able to control themselves to stay calm, relaxed, and concentration.

## CONCLUSION AND SUGGESTION

The results of this study concluded that intervention in the form of mental training is effective in improving confidence of swimming athletes. In other words, mental training systematically and comprehensively structured to provide maximum impact for increased sport-confidence of athletes.

This study still apply the same mental training for all athletes, so there is no individualized mental training programs for each athlete. Future studies will need to adjust the portion of the provision form and mental skills for each athlete. So it makes a mental training program is more individualized, focused, and purposeful. A similar study can be directed to cross other sports, so the data obtained richer. To support this, it needs more mental trainer to each kind of sports. The importance of education phase ini mental training, should be the concern of various parties. While the current number of psychologist or sport consultant is still limited, it needs to improve to provide services in sport psychology .

## REFERENCES

- (1) Azwar. S. (1992). *Reliabilitas dan validitas*. Yogyakarta : Sigma Alpha.
- (2) Bhamri, E., Dhillon, P.K., Sahni, S.P. (2005). Effect of psychological interventions in enhancing mental thougness dimensions of sport persons. *Journal of the Indian academy of applied psychology*, 31, 65-70.

- (3) Berukoff, K.D., Hill, G.M. (2010). A study of factors that influence the swimming performance of Hispanic high school students. *International journal of aquatic research and education*, 4, 409-421.
- (4) Deputi Bidang Peningkatan Prestasi Olahraga, Kementerian Pemuda dan Olahraga. (2011).
- (5) Fanning, P. (1988). *Visualization for change*. California : New Harbinger.
- (6) Goldfried, M.R., Trier, C.s., (1974). Effectiveness of relaxation as an active coping skill. *Journal of abnormal psychology*. 83 (4), 348-355.
- (7) Goldsmith, W. (2011). *Swim coach brain*. Australia : Playright Publishing and Swimming.
- (8) Gunarsa, S., Soekasah, M., Satiadarma, M.P. (1986). *Psikologi olahraga prestasi*. Jakarta Pustaka Obor.
- (9) Howe, B.L. (1991). Imagery and sport performance. *Journal of sport medicine*, 11, 1-5.
- (10) Loehr, J.E. (1982). *Mental thougness training for sports*. New York : Forum Publishing Company.
- (11) Middleton, S.C., Marsh, H.B., Martin, A.J., Richards, G.E., Perry, C. (2001). Discovering mental toughness : A qualitative study of mental toughness in elite athlete. *Journal of sport and exercises psychology*. Australia : University of Western Sydney.
- (12) Nasution, Y. (2009). *Latihan mental bagi atlet pelajar*. Jakarta : Pusat Pengembangan Kualitas Jasmani, Sekretariat Jenderal Departemen Pendidikan Nasional.
- (13) Nasution, Y. (2010). *Menjadi pelatih mental bagi olahragawan*. Jakarta : Deputi Bidang Peningkatan Prestasi dan IPTEK Olahra, Kementerian Pemuda dan Olahraga.
- (14) Porter, K., Foster, J. (1990). *Visual athletics*. Dubuque, IA : Wm C.Brown.
- (15) Satiadarma, M.P. (2000). *Dasar-dasar psikologi olahraga*. Jakarta : Pustaka Sinar Harapan.
- (16) Stelter, Reinhard. 2003. Future Perspectives for a Possible State-of-the-Art in Sport and Exercise Psychology. *Journal of sport psychology*. Belanda : University of Copenhagen.
- (17) Townsend, C. (2005). *Training for swimmers*. Australia : Bellissima Publishing.
- (18) Weinberg, R.S., Gould, D.G. (1995). *Foundation of sport and exercise psychology*. USA Human Kinetics.

# **THE IMPLEMENTATION OF PHYSICAL AND HEALTH EDUCATION IN SCHOOL**

**Kamal Firdaus**

**State University Of Padang, Indonesia**

## **Abstract**

The problem of this paper is about the facilities, utilities, teacher's quality and quantity, participation and extra work as well as the future is pledge of application of physical and health education learning in general school. The aims of this paper are physical domain, psychomotor, cognitive, and affective.

The conclusions of this paper are:

1. Training program developing sports is a part of an effort in increasing physical and spintual of human a quality.
2. The aim of physical education is oriented on the curriculum.
3. The application of physical education in school is an effort of athlete's telentscouting.

Suggestions of this paper are:

1. To keep balance between learning in one side and an effort of sport achievement increasing in another side.
2. The quantity and the quality of teachers is the main support to the process of teaching and learning.
3. There is the need increase the school facilities in quantity as well as the quality.

## **INTRODUCING**

Sport as a social-cultural phenomenon has rapidly increased and developed, so it can be said that as technology and science are advancing, consequently, sports are also needed to keep people's life in balance.

In addition, sport is an integral part in education which is able to give a valuable contribution toward the whole human's development for the rest of their live. In clause 4, National Education Regulation, no 2. Year 1989, it is stated that national education aims at improving the live of people and developing the citizen of Indonesia to be whole. Who are faithful to God Almighty, well-behaved, knowledgeable, skillful, healthy in terms of physical and spiritual, personally great and indepent, and responsible toward society and nationality.

In GBHN (1988) it is also stressed that the development of education is a part of improving the quality of indonesian in the purpose of enchancing physical and spiritual fitness for society, character, discipline and sportivity building, and increasing achievements in sports which can evoke the pride of the nation. In relation to these facts, it is necessary to improve physical education and sport in schools which develop sports, the effort in socialize sport and making them do it as a habit. It is also to create an environtment that support society to participate responsibly in educating and developing sports, especially in improving the training of the next candidate of athletes. ( for athlete's talent scouting )

The development of sport is a part of an effort to enchance the quality of indonesian, which is specialized in enhancing the physics and spirits of all people, character, discipline and sportivity building, and increasing achievements in sports which can evoke the pride of the nation. Thus, it can lead to these implication :

- a. Physical education and sport will enhance the physical and spiritual fitness which led to improving human's quality.
- b. Physical education and sport in school need to be improved

- c. Physical education is a physical activity which led to the sport activity
- d. Aside from enhancing physical and spiritual fitness, Physical and spiritual education also function as character, discipline, and sportivity building.
- e. Physical education in school, should give a chance to socialize sport and make them do it as a habit that is reflected in the enhance of physical fitness.
- f. Physical education in school, should be related with values of life, such as : sport habit and healthy life style.
- g. Youth is the most keen moment in the effort to train athletes. Physical education teachers should be given a chance and skill as a coach in their school, which is implemented in school's policy.

## **PHYSICAL AND HEALTH EDUCATION**

The aims of physical education in school is a part of National education's goal. Physical education that is applied today is oriented from the completion of the 1975 curriculum. Curriculum as an instrument to achieve the goals of education, in particular, and generally the aims of development are the implementation of GBHN. Along with the growth of development of science, technology and national development so the instrument to achieve the goal should be in line along with the demands of the progress itself.

Physical and health education is a process of education which encourages, guides, develops, and builds their physical and spiritual also the student's health and environment for them to live in harmony and optimally, so they are able to do their duty for themselves and national development.

The term "Sport and health education" has been changed into "physical education" as stated in Decree of Minister of Health and Culture no 0413/U/1987 that has been enforced for elementary, junior high, and senior high school curriculum. In the consideration of the Minister of Health and Culture decree, it is stated:

- a. Physical education is an integral part from the whole education
- b. Physical education aims to develop individual organic, neuromuscular, intellectual dan emotional
- c. In the recent years, implementation of sport and health only teach about the basic movement and the basic skills, so it need to be improved.

Those consideration has shown the basic ideas to develop physical education system including the completion of existing curriculum. It is expected to begin on 1994.

On the other hand, if we put our attention on the limitation that has been created by UNESCO (1974). It is printed on International charter of Physical Education, which are "Physical education is a person's education process as an individual or as a member of society which is done consciously and systematically through various physical activity in order to enhance physical skills, intelligence growth, and personality build." A systematically arranged learning material as the part of curriculum in form of a certain study which comes from elements of Athletic games, dance, exercise, martial arts that are adapted and chosen so that it can be implemented to the physical education practice in schools are needed.

According to explanation above, it is clearer to see that to achieve a good physical education teaching in school, skillful professional educators are needed as qualified teachers on their own field. Because those teacher are expected to :

- 1. Educate the students to be Indonesian, based on Pancasila, who are able to manage himself and be responsible to the nation development
- 2. Provide the students with the ability to continue their study to the higher stage
- 3. Provide the student with the basic ability to live among the society and develop themselves according to their own talent and interest.

## **DISCUSSION**

The curriculum or education program of physical and health education which prioritizing in movements or physical activity based on the growth rates and development of

students in the form of the introduction of preschool, basic movements, attitudes and habit on primary education as well as the development of knowledge and the ability on secondary education.

The success of implementaion of physical and health education, besides students' achievements who have good organic functions; neuromuscular junctions, intellectual and emotional, and psychological harmony, is highly dependent on:

1. the achievement of a healthy atmosphere / condition in the implementation of the program.
2. the realization of interaction of managers from the level of decision makers to coaches in the field and students.
3. the availability of adequate facilities and infrastructure as supporting for the implementation of the curriculum
4. the availability of sufficient numbers of teachers who are accompanied by satisfactory quality

In short, the purpose of what is expected and can be earned in physical and health education for students' ability namely:

No	Dominan-dominan yang dicakup Pendidikan Jasmani dan Kesehatan	SD			SMP			SMA		
		M	S	L	M	S	L	M	S	L
A	Domain Fisik									
	1. Kekuatan	V				V				V
	2. Daya tahan otot	V				V				V
	3. Daya tahan cardio respiratory	v				V				V
	4. Kelenturan	V				V				V
B	Domain Psikomotor									
	1. Kemampuan gerak perceptual									
	a. Keseimbangan	V	V			V				V
	b. Kinestik	V	V			V				V
	c. Visual	V	V			V				V
	d. Auditif	V	V			V				V
	e. Koordinasi mata dan gerak	V				V				V
	f. Taktil	V				V				V
	2. Keterampilan gerak dasar									
	a. Keterampilan manipulative	V				V				V
	b. Keterampilan manipulatif dikaitkan dengan benda	V				V				V
	c. Keterampilan olahraga	V				V				V
C	Domain Kognitif									
	1. Kognitif									
	2. Penalaran	V				V				V
D	Domain Afektif									
	1. Dampak kegiatan jasmani terhadap kesehatan	V				V				V
	2. Aktualisasi diri	V				V				V
	3. Harga diri									

Description :

M : Beginner, introduction dan development phase

S : Intermediate, development and improvement phase

L : Advance, mastering phase

Introduction : Introducing different movements, postures, objects and its properties.

Development : Developing the concepts or forms that are already known with modified it into more effective and efficient.

Mastering : Gaining control of the combination of space, time and shape

Note :

For further description of the goals, which are expected in physical and health education, can be seen in appendix 1 page 15

## **PROBLEM**

Based on several kinds of the description above, which has been told in a practical manner, it is not necessarily can be carried out flawlessly. It is caused by some obstacles encountered in the field, they are:

a. Infrastructure

The school's field is not less than enough, especially for school located in larger cities. If a field is available, it will be used jointly by two or more at the same time. This situation will be difficult for teachers to implement sport activities well.

b. Equipments

The number of sports equipment that is owned by a school was very limited and the quality is low. In addition, the ratio between the tools available to the number of students in general is 1: 10, whereas a comparison between sports equipment and students ideally is 1: 2.

c. Educator

The quantity of P.E. teacher in general is sufficient but another problem has arisen. The distribution of teachers in some cities is not spread evenly which makes some schools does not have any Physical Education teacher. The quality of P.E. teacher in accordance with scientific and technological development should be increased. Because no matter how excellent education curriculum applied, if it is not supported with a good quality teacher, students' achievements or interest will be lower.

d. Participation and extra efforts

To carry out the physical education in schools, the physical education teachers are aided by the school, the owner and a supervisor. However, those 3 elements are the ones who give difficulties for the teacher. So that, the authority of P.E. teachers to channel the talent and interest of the students are disturbed. In addition, most teachers in a school also serve as bodyguard for the principal which is essentially illegal. This additional job will reduce the thought and the attention to Physical Education activities at school.

e. Future promise

Students' interest will gradually reduced because of the thought from teachers and parents who put P.E. education as a subject which is not important, because it does not have an influence with students' report card. In addition, there are parents who delight if the children have good score in math that being able to do a 2,10 meters high jump. In fact, students who have sports' achievement find it hard to increase their grade, because they lack of intellectual competence.

By the fact that the parents are more likely oriented for their children future, academically, than to support their children for sport achievements whether at school or at the club.

## **CONCLUSION AND ADVICE**

### **A. Conclusion**

The development of sport is a part of an effort to enhance the quality of Indonesian, which is specialized in enhancing the physics and spirits of all people, character, discipline and sportivity building, and increasing achievements in sports which can evoke the pride of the nation.

In addition, sport is an integral part in education which is able to give a valuable contribution toward the whole human's development for the rest of their live.

The aims of physical education in school is a part of National education's goal. Physical education that is applied today is oriented from the completion of the 1975 curriculum. Curriculum as an instrument to achieve the goals of education, in particular, and generally the aims of development are the implementation of GBHN. Along with the growth of development of science, technology and national development so the instrument to achieve the goal should be in line along with the demands of the progress itself.

The implementation of physical education in school is an effort of training athletes and socializing sports and also, implicitly, to make them do it as a habit. However, in fulfilling those goals there can be found some factors, either restricting or supporting, that influence it, such as :

a. Restricting Factors

- 1) Inadequate school field.
- 2) High-quality and expensive sport equipments are limited.
- 3) The placement of physical education teachers is not well-managed.
- 4) The effect of scores in physical education does not play a role in grading the students so the parents do not consider much about physical education.

b. Supporting Factors

- 1) Physical and Health Education has been included in the school curriculum.
- 2) The government has provided financial help for the sport facilities in school.
- 3) Even though the number of physical education teachers are not significant, at least they are available.
- 4) There are under-developments stadiums in several places.

B. Advices

According to the explanation from the conclusion, there are some advices that can be given :

- 1) To keep the balance between learning and the effort to increase students' sport achievements in school, socialization should be held for the parents in order to make them support the school's programs.
- 2) The quantity and the quality of physical education teachers which are the main support to the process of teaching and learning, should be improved through workshop.
- 3) There is the need in enhancing the school facilities in term of quantity or quality.

## REFERENCES

- Ateng, Adul Kadir, (1991) "Ke Arah Pembentukan Sistem Pendidikan Jasmani Di Indonesia". FPOK IKIP Jakarta.
- Depdikbud, (1991) "Pendidikan Jasmani Dan Kesehatan SD, SLTP, dan SLTA". Balitbang Depdikbud, Jakarta.
- Depdikbud, (1991) "Pedoman Penyelenggaraan Pendidikan Prajabatan Program D II PGSD Guru Kelas". Dirjen Dikti, Proyek Pembinaan Tenaga Kependidikan Jakarta.
- GBHN, (1998) "Bahan Penataran Dan Bahan Referensi Penataran Pola 100 Jam". Dirjen Dikti Depdikbud, Jakarta.
- Soemitro, (1991) "Implikasi Peraturan Perundangan Terhadap Pendidikan Jasmani Serta Rasional Kebutuhan Dan Pelaksanaan Pendidikan Jasmani Di Sekolah Dasar". FPOK IKIP Jakarta.



Waliono, Hasan, (1998) “Penyelenggaraan Pendidikan Jasmani Dan Kesehatan Serta Pembinaan Olahraga Di Sekolah Dalam Upaya Pembibitan Olahraga Nasional”. Dikdasmen Depdikbud, Jakarta.

UNESCO, (1974) “ Declaration on Sport” Paris, Place du Fontenoi.

# THE FACTOR THAT AFFECTS PARTICIPANTS OF KASETSART UNIVERSITY'S THAI-SWORD COMPETITION

Kanlapruk Polsorn<sup>1</sup> and Achara Soachalerm<sup>2</sup>

Kasetsart University<sup>1,2</sup>, Thailand

## Abstract

The purposes of this research were to study the factor that affects participants of the Kasetsart University's Thai-Sword Competition and to understand their points of view. The study was accomplished by asking 97 Thai-Sword participants to fill out survey forms. The main tool employing in this research was a questionnaire-based survey form. This form was created by the Kasetsart's Thai-Sword researchers. The questionnaire had been thoroughly examined by 5 experts for content validity. It got the Index of item Objective Congruence of 0.8 – 1.0. It looked for a Correlation Coefficient and measured reliability by using Cronbach's alpha, which had the value equal to 0.90. And it analyzed data by using a predefined software program to compute for data frequency, percentage of population ( $\mu$ ), and t-test. The result of this research revealed that most survey participants were female, between the ages of 18 and 25 years old. All of them were students/educators who held bachelor's degrees. Their responses on Thai-Sword were in a very good level ( $\mu = 3.91$ ). When compared the data from one-way analysis of variance (one-way ANOVA) between this particular Thai-Sword focus group with other groups, such as a group with different genders, different education levels, and different careers, the outcome was apart at statistical significance level of .05.

**Keywords:** Thai-Sword, Participants, Kasetsart University, Krabi-krabong

## INTRODUCTION

Based on the Thailand's Eleventh National Economic and Social Development Plan, 5.2 Development of the lifelong learning society has laid out development guidelines. It gives importance to 5.2.3, which promote the reduction of risk in health. Under this guideline, it stated *"People will have physical and mental well-being, as well as knowledge and skills in health care at the individual, family, and community levels. They will participate in formulating public policies for health care. Public health services will be improved for better quality and coverage, together with the promotion of alternative medicines. Supply of health personnel will be redistributed, while national health database will be developed. Monetary and fiscal measures for health care will be managed in efficient and sustainable manners."* (Office of the National Economic and Social Development, 2013) The statement is consistent with the Fifth National Sports Development Plan (2012 – 2016). The clause 3.7 stated "Promoting a better understanding between cultural and sports exchanges between ASEAN folk. Through physical education, sport and recreation to promote success and good understanding in the member countries with different cultures. Teaching values and heritage of ASEAN in school sports programs and institutions, including the development and teaching of ASEAN to promote language learning and promoting linguistic exchange between them. The curriculum ASEAN education in school sports and academic institutions" (Ministry of Tourism and Sports, 2011) statements indicate that sports promote strong body, increase health awareness, and preserve intangible of Thai culture to remain with Thai community.

There're different kinds of popular sports in Thailand: for exercises and competitions. But for some reason, Thai-Sword or Thai fencing is not one of them. It's a tragic irony to state that Thai-Sword, which has been with Thai people since the beginning of Thai history, was not a well-received sport by Thai population. Besides, Thai-Sword was founded and developed by a local intellect. It was influenced by krabi-krabong (single-edge sword and pole fighting) which was a unique heritage of Thailand that passed down by Thai ancestors. In ancient times,

krabi-krabong was an honorable sport that played a big role in keeping Thailand free from being colonized. Back then, Thai people fought a battle with many weapons, such as daggers, double-edge swords, bladed staff, spears, shield, etc. Nowadays, krabi-krabong is no longer used in combat; it has become a performance dance or a contest for the current generation to witness (Prayuk Bunnak, 2013).

Thai-Sword was established by Srithairat Combat House, which founded by Lieutenant Commander Jaroon Thiriat. In 1935, He started to modify and convert krabi-krabong into Thai-Sword. He reformed Thai-Sword to be used in the real-world situation, not just to perform or use it in a contest. He also set up rules and regulations for Thai-Sword competition. Since then Thai-Sword became a preservation of Thai martial arts sport competition. In the old days, there were often wars between Thailand and its neighbors. The battle technique was a close combat fighting; therefore, weapons would be informed of double-edge swords, single-edge swords, shield, and so on. Thai soldiers had to train to use weapons regularly until they became the experts in those weapons. However, if they were to use real weapons, they could injure, wound, or intentionally kill one another. To avoid a disastrous accident, model weapons were invented, with the use of wooden sticks, rattan, cowhide, or buffalo hide. Soldiers used them in place of the real weapons in their training exercises. When there was no war and the country was in peace, soldiers stopped giving their best effort into the trainings. And because of that a new methodology called Strategy Sport (or Battle Sport) was invented to make the training exercises more pleasant. This new reconfiguration allowed participants to use simulated weapons to compete against one another under specific guidelines, rules, and regulations. Later on, they added some dance moves to it. The practice was passed down from generation to generation. It eventually evolved to be an entertaining form and a part of Thai culture. At the present time, Thai-Sword was appraised to be a valuable activity in physical education (P.E.) (Sports Association of Thailand Thailand Nationals. 2013)

Originally, Thai-Sword and krabi-krabong were kings' sports. These two fighting styles were parts of the 18-courses of kings' education. These sports got spread to the general population of Thais at the beginning of Rattanakosin period. Throughout Phra Bat Somdet Phra Poramenthra Maha Mongkut Phra Chom Klao Chao Yu Hua's (or Rama IV's) reign, Thai-Sword and krabi-krabong were booming. King Mongkut was very pleased with krabi-krabong performance. Krabi-krabong and Thai-Sword would widely be performed in important celebration events, such as atut shaved off ceremony, an ordination ceremony, a Kathin ceremony, etc. In Rama V's reign, Phra Bat Somdet Phra Poraminthra Maha Chulalongkorn Phra Chunla Chom Klao Chao Yu Hua was a big fancier of krabi-krabong performance. During that time, many renowned Muay Thai (Thai kickboxing) and Thai-Sword masters were born. In 1906, Ecclesiastes Drug Association started krabi-krabong institute. Khun Yeesarn sunyakorn or Master Sang-darb was in charge of teaching and spreading the art to public. (Jaraen Paholtap. 2010).

Benefits of krabi-krabong can be described as following:

1. Be able to use for self-defense and in times of danger
2. Help reinforce body strength
3. Improve moral characteristic values, such as bravery, tolerance, Self-confidence, and self-dependence
4. Build a sense of pride in a national greatest self-defense martial art
5. Preserve the unique traditions and beautiful culture of Thai community
6. Improve an individual manners and support spiritual values

(Muslim News Thailand Post. 2014)

Therefore, the researchers recognize the importance of Thai-Sword and krabi-krabong. They realize that these sports effectively benefits human's physical body, society, human's emotions, and mentality of athletes and people who are interested.

### **Objectives**

1. To study the factor that affects participants of the Kasetsart University's Thai-Sword Competition
2. To survey the participants for their points of view regarding to Thai-Sword

### **Scope of Study**

In this research, the researchers had set the parameters as listed below:

1. The focus group for this study was the participants of Kasetsart University's Thai-Sword Competition in the amount of 97 people
2. The research time period was on August 2012

### **Specific Definitions**

1. Thai-Sword means a specific sport which was established by Kasetsart University's Thai-Sword club
2. Krabi-krabong means a single-edge sword and pole fighting style

## **RESEARCH METHODOLOGY**

### **1. Research Format**

This research is the Quantitative Research. The objectives are to study the factor that affects participants of the Kasetsart University's Thai-Sword Competition of and to understand their points of view.

### **2. Focus Group**

The 97 participants of the 2012 Kasetsart University's Thai-Sword Competition

### **3. Data Collecting Tool**

The main tool employ is a questionnaire-based survey form. The survey is used to gather data from Thai-Sword participants. There are 2 parts of the survey: part 1 contains 10 questionnaires collecting general information, and part 2 has 26 questionnaires collecting the participants for their opinions about Thai-Sword.

The research team started to produce this tool from several related documentations, such as a thesis, a study report, academic journal. These documents were used to set up an objective and parameters of the research. After gathering data from the mentioned sources, the survey was created. The research team then gave it to 5 savants, who were knowledgeable in this particular area, for verify and validate the content (Content Validity). In this process, the experts provided recommendations to improve the content of survey. There after, the research team modified and fixed the questionnaires based off the experts' advice. The researchers tested it with another control group that has similar characteristics as the actual focus group. If there was still a flaw, the research team would amend and fix it once more. Subsequently, the questionnaires would be given back to the experts for a final evaluation. The survey then got put away in a secure place and ready to use with the actual focus group.

### **4. Data Collecting Process**

The research team collected data themselves by using the ready-to-use survey. The data was collected from participants during the 2012 Kasetsart University's Thai-Sword Competition.

### **5. Data Analysis Techniques**

Using a Descriptive Statistics method to look for the frequency percentage of  $\mu$  and statistical analysis of t-test. It also compared the data between the focus group and other groups by using one-way analysis of variance (one-way ANOVA).

## **Literature Review**

In this research, the research team studied documents that involved with the issues listed down below:

- 11.1 The research result of the participants who entered Thai-Sword competition
- 11.2 Thai-Sword

## RESEARCH RESULTS

Most of the survey participants were female, between the ages of 18 and 25 years old. All of them were graduated students. Everybody had already participated in krabi-krabong, Thai-Sword, and self-defense martial arts competitions by having a routine practice time about 1-2 months with 3-5 days a week and 2-3 hours every day.

The participants' points of view about Thai-Sword was in a very good level ( $\mu = 3.91$ ). When analyzed the response closely, the majority of them looked at Thai-Sword and krabi-krabong as a way to train a person's mind and to practice meditation ( $\mu = 4.68$ ); and they agreed that Thai-Sword and krabi-krabong skills should be broadly introduced to public ( $\mu = 4.51$ ).

The differences in perspective between Thai-Sword participants group and a group with opposite gender was apart statistically significant at the .05 level. When using the one-way analysis of variance (one-way ANOVA) method, the result between different education levels showed the statistical significance at level .05 as well. And when performed Scheffe's method of pair wise multiple comparison, the statistical analysis between bachelors' degrees and higher degrees showed the significance at .05 level.

Another result from one-way ANOVA exhibited the distinction of view points between Thai-Sword participants group and a group with different careers at the statistical significant .05 level. And when performed Scheffe's method of pair wise multiple comparison, the statistical analysis between government officers/state enterprise workers and students/ undergraduate/ educators showed the significance at .05 level.

## CONCLUSIONS & DISCUSSION

The study of factor which affects participants of the Kasetsart University's Thai-Sword Competition indicated that the majority of athletes were students/ undergraduate who took Krabi-Krabong classes in accordance with the curriculum by Ministry of Education. When they gained experience in Thai-Sword and krabi-krabong, they were fired up and wanted to participate in the competition. Thai-Sword promoted mental wellness as well as physical activities. It helped get the athletes' minds into a peaceful stage. And importantly, it was another to protect the long cultural heritage of Thailand. But there were only a handful of people give precedence to this sport. In other words, this sport did not receive enough attention as much as it deserved. If this problem kept continuing, Thai-Sword would slowly be diminished and might be ousted from Thai population one day. This concern was accorded with Pramuan Buatong's (1994) research paper under the title "Development of Sword and Pole Fighting." In her research, she interviewed a krabi-krabong professional and stated his concerns of krabi-krabong in the near future.

The expert expressed that the progress of krabi-krabong had a tendency to slow down because of many unfavorable factors. For instance, the lack of support from government, lack of krabi-krabong teachers/ coaches, lack of budgets, and there was no official organization willing to sponsor the program. Because of the prior-mentioned reasons, krabi-krabong was under developed and participants couldn't make a career out of it. If the government, private sector, schools/ colleges/ universities, Sport Authority of Thailand, Ministry of Tourism and Sports, and all the krabi-krabong/Thai-Sword organizations worked together to preserve, support, improve, and develop krabi-krabong earnestly, the problems would successfully be resolved. Krabi-krabong would make a recovery and continue to flourish in the future.

When discussed the level of krabi-krabong problems, there was an interesting research paper by Pitak Sritawan, 2004. His objective was to study the state and problems in operating of krabi-krabong organizations in formal and non-formal education. He only chose to investigate 6 organizations with high competency and well-known to public. Out of these 6 establishments, 4 of them were formal education (high school, vocational education, and higher education) and the other 2 were non-formal education. The content of interviews was adapted from Norbert Wiener's general systems theory. In addition, Norbert broke down an organization into 5 relevant factors which are environment, input, process, output, and feedback. The result of his research revealed all 6 organizations have the same state and problems with environment, input

(instructors, students, budget, equipment, and location), and feedback. However, they had the differences in state and problems with process and output. The organizations of formal education had a different internal structure and work process. They emphasized on producing athletes to compete in a tournament or competition outside the facilities. On the other hand, the organizations of non-formal education were more into a commercial-based business. They preserved the self-defense martial arts (krabi-krabong) but never entered into any tournament or competition. All organizations faced the similar issues, such as not enough budgets, lack of supports from other facilities/ departments, declining of social value in Thai community, and no sponsorship from the high level organizations/ departments. The research suggested that krabi-krabong organizations needed strong supports from private sector and government to establish krabi-krabong as a national organization.

This new organization would be the center for all krabi-krabong organizations around the country. It should have a systematic internal structure, build public relations, and be regularly promoted. It also needed to have trainings and seminars to develop krabi-krabong knowledge to people who involved. The rules and regulations must be regulated and enforced for standard administration. And the place should give access to students or participants to continue improving their skills. Simultaneously, sport science and new technology would appropriately be implemented to aid the learning and teaching experience.

Thai-Sword competition is a clever way to stimulate students/ educators and general public minds. It's time to realize that the valuable irreplaceable heritage about to vanish from Thailand. Therefore, it's time to take actions, continue to safeguard the asset, and pass down to the next generation and many generations to come.

## REFERENCES

- [1] Jaraen Paholtap. 2010. Development of the sword ..... of Thailand. search <http://www.sahavicha.com/?name=knowledge&file=readknowledge&id=1796>. Retrieved on February 19, 2014.
- [2] Muslim News Thailand Post. 2014. History of fencing swords were landing. Search <http://truepanya.muslimthai.com/main/index.php?page=sub&category=31&id=21040>. Retrieved on February 19, 2014.
- [3] Pitak Sritawan. 2004. State and Problems in Operating of Formal and Non-formal Educationin
- [4] Krabi-krabong Organization. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts (Sport Management). Faculty of Graduate Studies, Mahidol University.
- [5] Pramuan Buatong. 1994. Development of Sword and Pole Fighting. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Education (Physical Education) Faculty of Graduate Studies, Srinakharinwirot University.
- [6] Prayuk Bunnak. 2013. **"The Krabi-krabong Legend"**. Sarakadee Magazine. 9.(219). May,2013. Page 126.
- [7] Sports Association of Thailand Thailand Nationals. 2013. History sword Thailand. Search [http://thai-sports.org/?page\\_id=430&lang=en](http://thai-sports.org/?page_id=430&lang=en). Retrieved on February 19, 2014.
- [8] Office of National Economic and Social Development Board. 2012. Plans for national economic and social development. No. 11. Bangkok: Sahamitr Printing and Publication Ching limit.
- [9] Ministry of Tourism and Sports. 2011. National Development Plan. No. 5. Bangkok: The trade organization of the slip.

# MEASURING SERVICE SATISFACTION IN TIRTA KIRANA'S SWIMMING POOL

Kurnia Tahki<sup>1</sup> and Juriana<sup>2</sup>

Jakarta States University, Indonesia  
yana.tahki@gmail.com

## Abstract

Until now, many swimming pool conduct privat training for such children include in the swimming pool of Tirta Kirana Al-Azhar Kelapa Gading, North Jakarta. Many parents put their children for privat training in this swimming pool. This study was conducted to determine the extent of service satisfaction perceived by parents whose children joining privat training in Tirta Kirana's swimming pool. The study involved 60 parents as samples taken at random. Measuring instrument refers to five dimension of service satisfaction proposed by Johanes (1997), namely: tangible, reliability, responsiveness, certainty, and empathy. Validity of the instrument ranged from 0.380 to 0.660. While the reliability of the instrument  $r = 0.703$ . The result of this study showed that 51.7% of parents rate the service provided was satisfactory, while 23.3% rate it highly satisfactory and 25% still feels less satisfactory. These results of this study can be the evaluation material and as the reference to conduct a survey of the service satisfaction in another swimming pools.

**Keywords :** service satisfaction, swimming pool.

## INTRODUCTION

### Background

Until now, many swimming pools conduct private training for children, such as in swimming pool of Tirta Kirana Al-Azhar Kelapa Gading, North Jakarta. Although this swimming pool is a school's swimming pool, but is also open for public. Private training for public in Tirta Kirana's swimming pool started from the age of 5 years to old age. The cost of private training in Tirta Kirana's swimming pool namely one package for (ten meetings) of 500 thousand rupiahs for one child, each meeting is one hour and every coach could train three children for one hour. In this pool, there are a lot of parents who entrust their children to swimming privat training, both children inside of Al-Azhar and children outside of Al-Azhar.

Swimming coach at Tirta Kirana's swimming are average students and graduates of the Faculty of Sport Sciences, State University of Jakarta, so the training or teaching method is very good and right with the right learning techniques. This makes the parents did not hesitate to put their children in private swimming pools this.

However, sometimes there are still parents who complain about the services in Tirta Kirana's swimming pool such as a coach who did not come but do not give the news to the parents. Usually, the parents will be forced to order his administration can still exercise even with another coach. Meanwhile, another coach who is training his students respectively.

---

\*) *Presented in The International Seminar of Sport Culture and Achievement, Yogyakarta State University, 23 & 24th April 2014.*

\*\*) *Lecturer in Sport Science Faculty of Jakarta States University*

Dissatisfaction and disappointment parents also happen because her son had some packages but can not swim well. Whereas it happen because her son's motor ability is low and he afraids to swim. Although it has been described by the coaches, but parents still can not accept. Others parental dissatisfaction with the services in Tirta Kirana's swimming pool such as : ticket and privat training prices, also facilities and equipment provided. Although this is not felt by all parents whose children following private training in Tirta Kirana's swimming pool.

Based on the above problems, it appears that parents still are not satisfied with the services in Tirta Kirana's swimming pool. According to Kotler (2012), customer satisfaction is defined as the evaluation after buying, where the perception of the quality of the selected product or service meets or exceeds the expectations before purchase. Consumer satisfaction or dissatisfaction is a response to the evaluation of the perceived discrepancy or disconfirmation between prior expectations and actual performance of the product that is felt after usage. Satisfaction and dissatisfaction of consumers rely heavily on perceptions and expectations of consumers.

Zoeldhan (2013) defines a service is the ability of a company to provide all the expectations of our customers to meet their needs. While Kirom (2010) said that customer satisfaction expressed in terms of the service aspects received: quality, easy to pay, precision service, consumer information disclosure, and communication.

How to measure customer satisfaction are as follows (Kirom, 2010) :

1. Data were collected

The data collected is taken from the type of service by way of asking the service provider will measure the level of satisfaction of its service delivery, about the types of services that can be provided, who is providing services and to whom the services are rendered.

Write down any kind of service because this service to be measured its performance in providing customer satisfaction, service performance and service level of importance as: the level of expertise, timeliness, ease of contact, the ability to solve problems, which is owned facilities in providing customer service and ask in order to give value to the performance and level of service interests.

2. How to collect data

That is the way respondents were randomly selected and then do individual interviews using a questionnaire to measure the level of importance of service and the performance of service providers and choose the right time for the customer, do not specify their own time, but negotiated with customers at their leisure, so that there is agreement that the determination of the location measurement of customer satisfaction is very dependent on the scope of the study.

3. Comparative analysis

Customer satisfaction data can be analyzed by any service or geographic location or level of well-being, depending on the level of interest and desire in team evaluation and analysis to compare the levels of customer satisfaction based on service to service. Consumer satisfaction is determined by the quality of service and not the other way around. In evaluating customer satisfaction with products, services, or particular company.

Johanes (1997) conclude consumers generally refers to a variety of factors or dimensions, while in evaluating intangible services, customers generally use multiple attributes or factors that : tangible, reliability, responsiveness, certainty, and empathy. Tangible means the physical evidence as facilities, equipment, and means of communication. Reliability means the ability to deliver the promised services with immediate, accurate and satisfactory. Responsiveness is the desire of the staff and employees to help customers and provide services to the response. Certainty includes the knowledge and trustworthiness, free from doubt. Empathy includes the ease of relationships, good communication, personal attention and satisfy the needs of customers.

According to this theory, tangible refers to the physical facilities include: swimming pool, swimming equipment, and support facilities that exist in the swimming pool. Reliability is reliability coach which includes: having skills in training children, abilities in guiding children, and the ability to provide relief when the children drowned. Responsiveness is the responsiveness of the administrative staff which includes: a desire to help and a response in serving children. Certainty is the certainty intended prices include: private training price and the price of admission swimming pool. While empathy is the ability to empathize or interpersonal



skills of the coach which include: the ability to communicate, kindness or hospitality to parents, and sensitivity to parents.

The swimming pool of Tirta Kirana Al - Azhar Kelapa Gading is a swimming pool owned by the school of Al -Azhar Kelapa Gading. Many visitors who swim there, ranging from parents to children . They do outdoor activities with routine every day. This proved even more of a pool of customers who come in to do an outdoor activity each day. According to data from the management , the customers who come in weekdays ranged from 60 to 70 people each day, while on weekends the number of subscribers increased to 200 people .

The Tirta Kirana's swimming pool is located in the middle of Kelapa Gading residentia and close to the highway, so access is easy for customers to visit and exercise. Besides the swimming pool, providing faculty or coaches who can assist customers in learning swimming.

In addition, for those customers who follow the training, management supplied swimming equipment, so parents no need to bring the equipment from home as a tool in their learning process. For customers who are relaxing / resting around the pool there are benches and rest areas are adequate, which could be occupied to eliminate tired or waiting families who were swimming.

The Tirta Kirana's swimming provides a pool for adults and a small pool for children's pla . Another advantage of the pool which is the top of the pool is closed , so that the visitors who are not swimming in direct contact with sunlight although swimming in the hot sun.

### **Formulation of the Problem**

How extent of service satisfaction perceived by parents whose children joining private training in Tirta Kirana's swimming pool?

### **Goal and Benefit of the Reasearch**

This study wanted to know the extent of service satisfaction perceived by parents whose children joining private training in Tirta Kirana's swimming pool. Through this research, also developed an instrument that can be used to measure service satisfaction in other swimming pools which give private training.

## **RESEARCH METHOD**

This study is a survey research, using descriptive statistical analysis to obtain valid service satisfaction indicator and suitable for assessing service satisfaction level of parents in Tirta Kirana's swimming pool. Data collection was conducted in October 2013. Study population was parents whose children joining private training in Tirta Kirana's swimming pool. While the sample of the study were taken at random a number of 60 parents.

Instrument used in this research is the development from service satisfaction theory by Johaness (1997) which consists of five dimensions. They are the physical facilities (tangible), reliability coach (reliability), responsiveness of the administrative staff (responsiveness), certainty price (certainty), and emphaty/interpersonal skills of the coach (emphaty). The complete of service satisfaction instruments is as follows :

**Table 1 : Instrument of service satisfaction in Tirta Kirana's swimming pool**

Dimension	Indicator	Statement
A. The physical facilities	1. Swimming pool	(+) In my opinion, the Tirta Kirana's swimming pool is excellent for swimming training. (-) For me, the Tirta Kirana's swimming pool is not maintained so it is not suitable for swimming training.
	2. Swimming equipment	(+) In my opinion, Tirta Kirana's

		swimming pool has a complete swimming training equipment. (-) I judge that swimming training equipment at Al-Azhar Kelapa Gading is basd.
	3. Support facilities	(+) In my opinion, a lounge area in the Tirta Kirana's swimming pool is quite convenient and safe for storing goods. (-) In my opinion, the rinse or bathe in the Tirta Kirana's swimming pool room is still lacking a lot.
B. Reliability coach	1. Skills in training	(+) In my opinion , the average swimming coach at Tirta Kirana 's swimming pool has a good swimming exercise techniques . (-) I see the ability to swim coach at Tirta Kirana 's outdoor swimming pool is still less so that my child is difficult to swim .
	2. Ability in guiding children	(+) I'm happy with the way coaches train at Tirta Kirana 's swimming pool because it can guide my children . (-) I feel less satisfied because my child was not supervised exercise swimming at Tirta Kirana 's swimming pool .
	3. The ability to provide relief	(+) I am glad my child swimming lessons at Tirta Kirana 's swimming pool , when my son drowned then the coach helped my son quickly (-) My child's swimming coach looks panicked when my son would drown .
C. responsiveness of the administrative staff.	1.Desire to help	(+) I am satisfied that the staff at Tirta Kirana 's swimming pool directly contact the coach if the coach is yet to come . (-) I feel most of the staff at Tirta Kirana 's swimming pool to be ignored if the coach is yet to come .
	2. Responsiveness in serving	(+) I agree that the staff Tirta Kirana 's swimming pool respond well when there are parents complain about the coach . (-) I think the staff at Tirta Kirana 's swimming pool is not responsive to the perceived problems of parents .
D. Certainty Price	1. Prices of private training	(+) I am happy because the price of privat training at Tirta Kirana 's swimming pool affordable . (-) In my opinion, the prices of private

		training in Tirta Kirana 's swimming pool is quite expensive .
	2. The price of admission	(+) The price of admission of Tirta Kirana 's swimming pool including adequate for public of Kelapa Gading so many visitors . (-) In my opinion , the price of admission Tirta Kirana 's swimming pool is very expensive.
E. Empathy / interpersonal skills of the coach	1. ability to communicate	(+) In my opinion , the way coaches communicate with his child and the parents pretty well so far . (-) In my opinion , the reason of the absence of a coach is hard to understand by parents during this time .
	2. Hospitality to parents	(+) Attitude of swimming coach at Tirta Kirana 's swimming pool is quite friendly to me as a parent . (-) I find the attitude of the coach at Tirta Kirana 's swimming pool less polite to me as a parent .
	3. Sensitivity to parents	(+) Coach at Tirta Kirana 's swimming pool is able to understand what parents want .

Scoring of the questionnaire answers to each statement used Likert scale with the value of favorable (+) statements is as follows : agree strongly = 5 , agree = 4, undecided = 3, disagree = 2, disagree strongly = 1. While the value of unfavorable (-) statements is as follows : agree strongly = 1 , agree = 2, undecided = 3, disagree = 4, disagree strongly = 5.

The validity of an instrument showed how far it can measure what it intends to measure. The validity of the instrument is also defined as the extent to which the instrument is recording or measuring what it was intended to be recorded or measured (Hadjar, 1996). Based on data analysis, validity of this service satisfaction instrumen ranged from 0.380 to 0.660.

While the reliability of the instrument refers to the consistency of the results of recording data (measurement) if the instrument was used by the same person or group in a different time, or if the instrument was used by a person or group of different people in the same time or in a different time (Suryabrata, 2008). Based on data analysis, reliability value is  $r=0.703$ , meaning that the instrument is reliable and can be used to assess the service satisfaction in swimming pool which give the private training for children because it has the constancy over time .

## RESEARCH RESULTS AND DISCUSSION

Based on research data of service satisfaction obtained the lowest score of 74, and the highest score of 115. Moreover, it also gained an average of 95.2, standard deviation 9.18, and variance 84.41. With seven classes, made a frequency distribution of service satisfaction data as Table 2.

**Table 2: Frequency data of Service Satisfaction in Tirta Kirana's Swimming Pool**

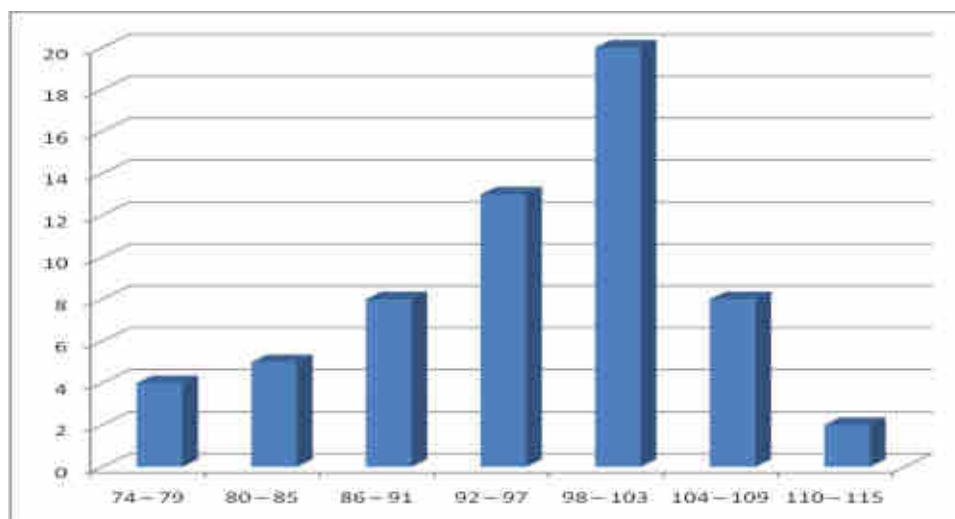
Nomor	Kelas Interval	Frekuensi		
		Absolut	Relatif (%)	Kumulatif (%)
1	74 – 79	4	6,67	6,67
2	80 – 85	5	8,33	15
3	86 – 91	8	13,33	28,33
4	92 – 97	13	21,67	50
5	98 – 103	20	33,33	83,33
6	104 – 109	8	13,33	96,66
7	110 – 115	2	3,34	100
Jumlah		60	100	

Meanwhile, an overview of service satisfaction in Tirta Kirana's swimming pool by category or level of satisfaction is as follows:

**Table 3 : Level/Category Data of Service Satisfaction**

No	Total Score	Kategori	Frekuensi	Presentase
1	74 – 87	Rendah	15	25%
2	88 – 101	Sedang	31	51,7%
3	102 – 115	Tinggi	14	23,3%

To further clarify the presentation, the service satisfaction data are also presented in the form of a histogram like Figure 1.



**Figure 1 : Data distribution of Service Satisfaction**

The result of this study showed that 51.7% of parents rate the service provided was satisfactory and 23.3% rate it highly satisfactory. Parents were satisfied with the existing physical facilities in Tirta Kirana's swimming pool such as: cleanliness and condition of the swimming pool, exercise equipment are provided, and support facilities are locker receptacle

and bathroom. Parents also feel quite satisfied with the coach at Tirta Kirana's swimming pool. Parents rate the coach has skills of training, able to guide and provide help when the child drowned. In addition, the coach also considered to have good interpersonal skills, friendly, able to communicate well, and be sensitive to the needs of parents.

On the other hand, there are still 25% still feels less satisfactory. This shows that there are still parents who are less satisfied with the service at Tirta Kirana's swimming pool. This dissatisfaction is quite diverse, there are disgruntled because of the condition of swimming pool which is less clean, less bathroom facilities, or less training exercise equipment appropriate with the needs of students. Some are still not satisfied with the competency of the coach. The coach are onsidered less skilled in training, less being friendly, or less able to communicate well with parents (especially when late or unable to attend on the day). This should be a concern of to the management of Tirta Kirana's swimming pool and have to the results of this survey as a material for evaluation.

## CONCLUSION AND SUGGESTION

Based on the processing and analysis of data, the authors conclude that service satisfaction perceived by parents whose children joining privat training in Tirta Kirana's swimming pool is quite good. Although there are still dissatisfied, but most were satisfied and very satisfied with the services provided by Tirta Kirana's swimming pool. This indicates that the service provided by Tirta Kirana's swimming pool is good enough.

For coaches of Tirta Kirana's swimming pool is expected to improve performance in order to maximize performance and satisfaction in the service to the parents. The managers in order to improve services in the Tirta Kirana's swimming pool. Managers also in order to complete the supporting facilities for visitors in the form of goods or locker daycare as well as the addition of a parking area, especially motorcycles. The development of instrument in this study, should support other researchers to apply and make it as the reference to conduct a survey of the service satisfaction in another swimming pools.

## REFERENCES

- [1] Hadjar, I. (1996). *Basics of Quantitative Research Methodology in Education*. Jakarta : Raja Grafindo Persada.
- [2] Johanes, S. (1997). *The lmeasurement of customer satisfaction level To Raise Market Share Pengukuran Tingkat kepuasan pelanggan Untuk Menaikkan Pangsa Pasar*. Jakarta: Rineka Cipt.
- [3] Kirom, B. (2010). *Measuring Service Performance and Customer Satisfaction*. Bandung: Pustaka Reka Cipta.
- [4] Kotler, P. (2005). *Marketing Management*. Jakarta : Indeks.
- [5] Suryabrata, S. (2008). *Research Methodology*. Jakarta : Raja Grafindo Persada.

# **THE EFFECTS OF ISOTONIC DRINK, COCONUT WATER, AND PLAIN WATER ON HYDRATION STATUS OF FOOTBALL ATHLETE BY URINE PROFILE VIEWING**

**Mirza Hapsari Sakti Titis Penggalih<sup>1</sup>, Arta Farmawati<sup>2</sup>, Retno Sutomo<sup>3</sup>, Muhammad Nurhadi<sup>4</sup>, Wiryatun Lestariana<sup>5</sup>, Muhammad Juffrie<sup>6</sup>, Lisandra Maria Goretti<sup>7</sup>, Hamam Hadi<sup>8</sup>**

**Gadjah Mada University  
mirza\_hapsari@yahoo.com**

## **Abstract**

Carbohydrate and electrolyte are the influential nutrient for stamina and rehydration processes in athlete. The low rehydration rate will be dangerous for body especially in tropical areas. That's why athlete should bring their meals and drinks while exercise and match to keep their body water requirement is adequate. Now days, the research about the benefit of alternative drink made from natural material for optimizing rehydration process is has been unvaried yet. There is a wide variety of commercial isotonic drinks circulating in the market which can be obtained with ease and can be consumed by anyone. Despite the vast numbers of circulating isotonic drinks, only a few were in accordance with the standard. This study is expected to provide health benefits in terms of optimizing the rehydration in athlete. Determine the effect of some drink for football athlete's rehydration by viewing urine profile. The study used an experimental design of clinical trials with a crossover design. About 12 UNY football athletes who have met the criteria divided into 3 intervention groups A, B, and C. Each subject was asked to consume three types of fluids, isotonic drink, coconut water, and plain water, which are given randomly as much as 1750mL. This intervention was given in three stage, 700ml, 600ml and 450ml. Differences in hydration status were analyzed using the One Way ANOVA. This analysis was performed using SPSS 17.0. This research shows that there is no significant difference between every intervention groups. This research shows that every intervention could bring back the hydration of athlete with similar outcomes. All of them give the image of good rehydration to prevent dehydration and change the body's electrolytes. This is stated by the urine profile i.e. clear yellow urine with the normal pH and specific gravity.

**Keyword:** rehydration, isotonic drink, coconut water, plain water, athlete.

## **INTRODUCTION**

The game session gives many fair chance and challenge for athlete and the whole team. A football athlete will lose much waters and energy while exercise and match session. The late of supply energy before physical exercise will be gaining the fatigue while doing exercise, more over the movement speed, skills, accuration, and concentration during the physical activity will be distracted. This condition will also give a high risk of dehydration. In a tropical environment, the low rate of hydration will be dangerous related to climate factors. Based on that, every athlete, before exercise, need to prepare extra meals and drink to keep their endurance while exercise and match, accelerate the dignification, and keep the balance of their hydration status.

Drink some water can help the body rehydration especially by paying attention in variant and volume of drinking water[1]. Beside of that, carbohydrate is also known as a good nutrient which can give effect to increase the stamina. Reference [2] said that consume an amount of carbohydrate and energizer drink will delay the fatigue by utilizing the glucose and fatty acid from carbohydrate as a fuel. Carbohydrate also helps the body to release the hormone

and the fatigue marker metabolite such as free tryptophan and ammoniac in blood. Some researchers have proven that high carbohydrate diet completely able to provide muscle glycogen requirement to keep the athlete's body stamina [3]. Some scientists [4] [5] [6] did an experiment about it. They increased the dose of carbohydrate drinking in some variant concentrate before the athlete does exercise and it gives a good impact to delay the fatigue. Research about isotonic drink has been doing in many times but the research with natural drink like coconut water which is fully rich with electrolyte and carbohydrate or plain water has not been doing yet. Based on the point above, this research is done. The aim of this research is to find out the effect of intake some variant natural and unnatural drink water related to rehydration rate and stamina athlete

## **RESEARCH METHOD**

This is an observational research by Cross-sectional Design approach. This research was held in ABADAN Laboratory, Wonosari Street, Yogyakarta in April to August 2010. This research was joined by 12 student's football athletes in Yogyakarta Government University. Their age range is between 18 – 25 years old. Subject was chosen by selecting based on some criteria such as no smoking, not in chronic illness, in fit condition, and willing voluntarily to join this research. Subject adaptation was done by giving the standardize diet and optimizing the body water fulfillment program the day before data collecting. Data collecting was done every day at 9 am-12am.

Rehydration test is done by standard procedure based on research [7]. The amount of total water intake is about 1750 mL in each product. The rehydration marker variables that had been used are urine color, urine clearance, specific urine gravity, and urine pH. The research's instruments are questionnaire, weight scale, urine collecting tools and urine testing tools. Data is presented by descriptive analyze method. It calculated using statistic One Way ANOVA test to find out the effect between each intervention and it processed with SPSS 17.0. This research has approved by Ministry of National Education, Faculty of Medicine, GadjahMadaUniversity, Medical and Health Research Ethics Committee (MHREC) Number: KE/FK/287/EC in May 11th, 2010.

## **RESEARCH RESULTS AND DISCUSSION**

In one day, the body regulate the balance of body water by thirsty and hungry mechanism that order people to get eating or drinking. Even though this mechanism runs natural, some condition may danger this mechanism such as severe activity, the change of temperature, and other. Not also ruins the mechanism, it is also potentially distracting the performance and stamina for athlete [8]. This point has been evidently being a reason for drinking some water before, while, and after exercise [9].

The research that uses rehydration as a variable is related to body water balance. The balance of body water shows by the balance of water input and output inside the body system. The normal cycle of body water in adult showed in sedentary pattern which invoke 1 – 3 L water per day. The losing of body water is caused by sweat and other insensible water loss such as evaporation water from respiration [10]. The insensible water loss from respiration is mostly neglected because it happen during aerobic metabolism.

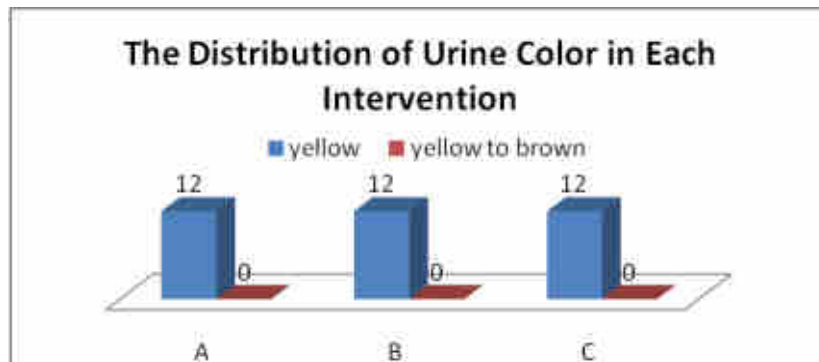
Observing the function of water rehydration for body needs the appropriate method to make sure the data collected. The combinations of total body water and plasma osmolality are gold standards to find out the hydration status. This gold standard is precise to use in sport science, medical science, or to determine the reference point of hydration marker. Nevertheless, this standard needs methodological control judgment, much expense, and also need a skillful person as administrator. That is why this gold standard rarely used to neither monitor the daily hydration status nor while game session [10]. Another substituent parameter that seldom used is urine concentration. Urine concentration is good enough to indicate the dehydration, include the decrease of urine volume, the increase of urine specific gravity, the higher of osmolality or the dark color of urine.

**Table 1. Characteristic if Subjects**

Characteristic	Value
Ages (years old)	$23.17 \pm 1.403$
Weight (kg)	$66.83 \pm 8.737$
Height (cm)	$170.42 \pm 6.788$
Body Mass Index (kg/m <sup>2</sup> )	$22.33 \pm 2.103$

The table above (Table 1.) is presenting the distribution of the adapted subject who met all the criteria and passed the whole step of research. By Table 1 we can conclude that all subjects are homogeny in age, weight, height, and body mass index. All of those characteristics are revolve in a small range of variation.

#### **Urine Color**

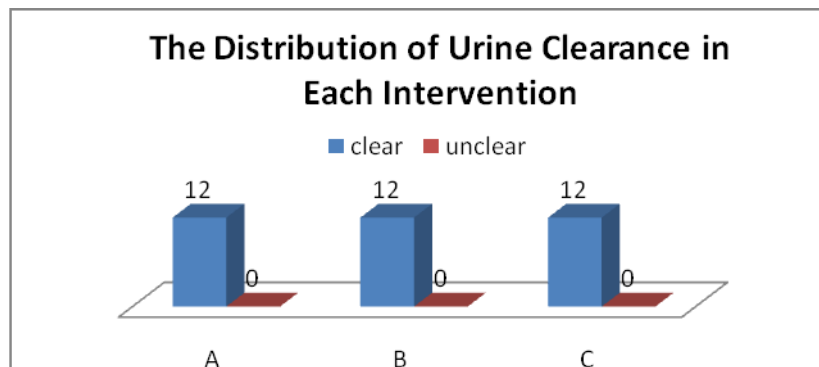


**Figure 1. The Distribution of Urine Color in Each Intervention**

Urine color is one of the good hydration markers. It is reliable, easy to applied, and do not need any invasionmethode[11]. Based on Figure 1.above, it shows us that all subject of intervention have the same color of urine. We also could conclude that in every kind of intervention, the athlete hydration status is good and there is no any significant difference.

All urine's color is yellow and it is the marker of good hydration status [12]. The range color of normal urine is so vary, start from pale yellow to amber, and it is given by the urine concentration[13]. All of the intervention gives the good effect to rehydration process in Athlete. The changing of urine color can be determined by some factors and it usually related to the kind of water that has drunk physiology condition [12]. Then, by the color of urine we can also determine the common physiology status related to urinary tract [1].

#### **Urine Clearance**



**Figure 2. The Distribution of Urine Clearance in Each Intervention**



The normal urine appearance is clear or colorless [13]. Drinking water frequently may affect the produce of clear urine. Based on the outcomes of this research, we know that every subject in every intervention group have clear urine. Even though not all intervention is isotonic, bat all intervention give the same effect in rehydration process.

In a reference explain if the dehydration body consumes isotonic drink, the liquid will entrance into the cell and replace the loosewater [14]. This condition will affect the amount of output water is less than the input. Besides the mineral compositions that make it isotonic, the carbohydrate contained in water also gives the side effect of better rehydration than the non-carbohydrate drinking water [15] [16] [17] [18]. But Figure 2., clearly showing us that there is no difference between three of them related to hydration status by urine clearance. This condition may appear because of the good physiology and homeostasis mechanism in athlete.

### Specific Urine Grafitry

**Table 2. Multiple Comparisons of Specific Urine Gravity**

Dependent Variable		(I) intervensi	(J) intervensi	Mean Difference (I-J)	Std. Error	Sig.
bj	LSD	1	2	.000917	.003667	.804
			3	-.001750	.003667	.636
		2	1	-.000917	.003667	.804
			3	-.002667	.003667	.472
		3	1	.001750	.003667	.636
			2	.002667	.003667	.472

The data that collected in this research are homogeny. By using The test of homogeneity variance, it is knowing that all the data is homogeny (p-value> 0,05). The dissemination of data is convergent and spread in a tight normal range. After calculate the date, it shows that average subject have the normal specific urine gravity. The normal referenceof urine specific gravity is about 1,015–1,025. This condition is a clear indication of a good hydration status [19]. If we compare between each intervention, it is quietly clear that there is no significant difference. This point is supported by p-value above 0,05.

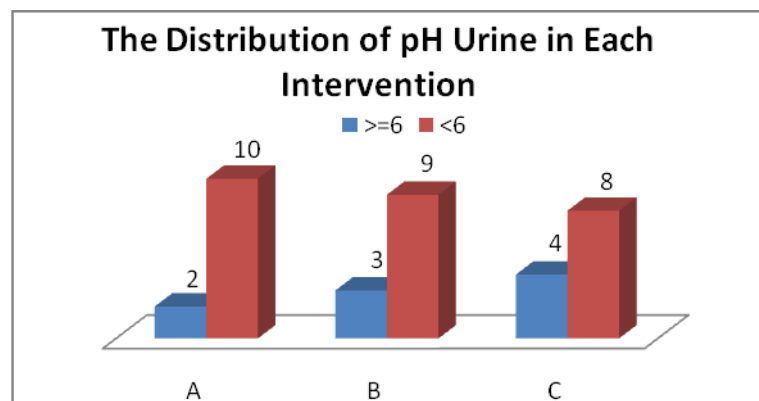
The specific gravity is one of the effective tests that are used to determine the dehydration condition [20]. In a research of a referenceabout an active teenager, value 1,025 is reputed as a high value and categorized as light dehydration [21]. Based on other reference [220, the high value of specific gravity is about 1,028 because it contain of highlyconcentrated urine. If we conclude every point above, related to the reference point of specific gravity, all of intervention gives a good effect to hydration status.

### pH Urine

**Table 3. Multiple Comparisons of pH Urine**

Dependent Variable		(I) intervensi	(J) intervensi	Mean Difference (I-J)	Std. Error	Sig.
pH	LSD	1	2	-.2500	.1638	.136
			3	-.1250	.1638	.451
		2	1	.2500	.1638	.136
			3	.1250	.1638	.451
		3	1	.1250	.1638	.451
			2	-.1250	.1638	.451

The data of acidity or pH in this research are spread in a homogeny group (p-value> 0,05). By multiple comparison test, every intervention is compared each other and all p-value are higher than 0,05. It shows us that all data do not have any significant difference.



**Figure 3. The Distribution of pH Urine in Each Intervention**

The normal pH of urine is about 4,6- 8,0 with average range about 6,0. It makes commonly urine is in acidity ambience[19]. The data pH distribution of this marker is majority under 6. It is appropriate with the standart that have been given before as reference (Figure 3.). This marker shows us that most of the subject in every intervention group is implied in normal range, which is about 5 to 6.

## CONCLUSION AND SUGGESTION

This research shows that there is no significant difference between every intervention groups. Every intervention could bring back the hydration of athlete with similar outcomes. All of them give the image of good rehydration to prevent dehydration and change the body's electrolytes. This is stated by the urine profile i.e. clear yellow urine with the normal pH and specific gravity. So that, we can clearly conclude that rehydration process in Athlete around 18 – 25 years old is mostly same event the intervention drinks are different. It may cause by the normal physiology and homeostasis that adapting fast.

## ACKNOWLEDGMENT

We would like thank to PT. Kalbe Farma Laboratories who funded this research, Abadan Life Support for the laboratories setting, All Football Athletes from Yogyakarta State University and all research members who give a lot of contribution to this research from the beginning until it published to this seminar.

## REFERENCES

- [1] Goretti, Lisandra Maria., "The Difference of Administration Effects of Banana Isotonic Drink and GoldStandard Isotonic Drinks on Hydration Status in Elderly by Morning UrineProfile Viewing," unpublished.
- [2] Davis,J.M.,Brown,A.S. "Carbohydrates,Hormones,andEndurancePerformance" Sport Science Exchange.Vol.14 (1) , 2001.
- [3] Kirkendall, D, T. "Creatinine, Carbs, and Fluids: How Important in Soccer Nutrition,"Sports Science Exchange. Volume 17: 3. 2004.
- [4] Leatt, P.B., and I. Jacobs. 1989. Effect of glucose polymer ingestion on glycogen depletion during a soccer match. Can. J. Sport Sci. 14:112-116
- [5] Kirkendall, D.T, C. Foster, J.A. Dean, J. Organ and, N.N Thompson. "Effect of glucose olymer supplementation on performance of soccer players. Science and Football," I. London: E&FN Spon. Ltd., pp. 33-41. 1988.

- [6] Ostojic S.M dan Mazic S. "Effects of Carbohydrates-Electrolyte Drink on Specific Soccer Test and Performance," *Journal of Sports Science and Medicine*. 1, 47-53.2002.
- [7] Saat M., Singh, R., Sirisinghe, R.G., Nawawi, M. "Rehydration after exercise with fresh young coconut water, carbohydrate-electrolyte beverage and plain water," *Journal of Physiological anthropology & applied human science*. 21 (2): 93-104.2002.
- [8] Panel on Dietary Reference Intakes for Electrolytes and Water. Chapter 4, "Water, In Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate," Washington, D.C.: Institute of Medicine, National Academy Press, pp. 73-185.2005.
- [9] Convertino, V.A., L.E. Armstrong, E.F. Coyle, G.W. Mack, M.N. Sawka, L.C. Senay & W.M. Sherman. 1999. American College of Sports Medicine Position Stand: Exercise & fluid replacement. *Med. Sci. Sports Exerc.* 28: i - vii.
- [10] Cheuvront, S.N. & Sawka M.N. "Hydration Assessment of Athletes. *Sport Science Exchange*," 97. Vol:18:2. 2005.
- [11] Armstrong, L. A. "Assessing Hydration: The Elusive Gold Standard," *J Am Coll Nutr*. 26, pp. 575S - 584S.2007.
- [12] Pross, N. "Effect of 24-hour Fluid Deprivation on Mood and Physiological Hydration Markers in Women," *Nutrition Today*; 47, pp. S35-7.(2012).
- [13] Estridge, B. H., dkk. (2000) *Basic Medical Laboratory Technique* 4<sup>th</sup> Edition. Delmar Thompson Learning USA.
- [14] Guyton & Hall. (1997) *Buku Ajar Fisiologi Kedokteran* Edisi 9. Jakarta: EGC Penerbit Buku Kedokteran.
- [15] Maughan, R.J, Leiper, J.B. & Shirreffs. 1997. Factors Influencing the Restoration of Fluid and Electrolyte Balance After Exercise in the Heat, *British Journal Sport Medicine*, 31 : 175 – 182.
- [16] Williams MH, 2005, *Nutrition for Health, Fitness and Sport*, Edisi 7, Mc.Graw-Hill, New York.
- [17] Diafas, V., Chrysikopoulos, K., Diamanti, V., dan Bachev, V. (2008) Dehydration rates and Rehydration Efficacy of Water and Sport Drink During One Hour of Moderate Intensity Exercise in Elite Kayakers. *Br J B*; pp. 259-68.
- [18] Sun, J. M. F., Chia, J. K. K., Aziz, A. R. & Tan B. (2008). Dehydration rates and Rehydration Efficacy of Water and Sports Drink During One Hour of Moderate Intensity Exercise in Well-trained Flatwater Kayaker. *Ann Acad of Med Singapore*, 37 (4), pp. 261-5.
- [19] Mundt, L. A. & Shanahan, K. (2011) *Graff's Textbook of Urinalysis and Body Fluids* 2<sup>nd</sup> Edition. USA : Wolter Kluwer Health .
- [20] Stover E. A., Zachwieja, J., Stofan J., Murray R., Horswill, C. A. (2006). Consistently High Urine Specific Gravity In Adolescent American Football Players and The Impact of an CUTE Drinking Strategy. *Int J Sports Med*: 27, pp. 330–335.
- [21] Kavouras, S. A., Arnaoutis, G. (2012) Hydration Status in Active Youth. *Nutrition Today*; 47, pp. S11-S13.
- [22] Saladin, Ken. (2003). *Anatomy & Physiology – The Unity of Form and Function*, 3<sup>rd</sup> edition. New York : Mc Graw Hill, pp 880, 894-9, 901.

# RELATIONSHIP BETWEEN PERCENTAGE OF BODY FAT AND *SOMATOTYPE* ATHLETES OF PENCAK SILAT COMBATIVE CLASS REGIONAL TRAINING (PELATDA) DAERAH ISTIMEWA YOGYAKARTA

Nadia Hanun Narruti<sup>1</sup>, B.J. Istiti Kandarina<sup>2</sup>, Arta Farmawati<sup>3</sup>, Mirza Hapsari Sakti Titis Penggalih<sup>4</sup>

Gadjah Mada University

## Abstract

Pencak Silat is one of Indonesian martial arts and culture. Nevertheless the combative category left behind from Vietnam at SEA Games 2007. One reason is performance less than the maximum. The supporting factors of performance such as nutrition, nutritional status, somatotype, and fitness must be considered. The purposes of the study are to identify and define the relation between percentage body fat (%BF) and somatotype of PencakSilat combative PELATDA Daerah Istimewa Yogyakarta (DIY). It was a cross-sectional analytic study with observational design. The subjects were all pencaksilat athletes' PELATDA DIY (n=15). The variables studied were %BF and somatotype. Percentage BF measured with skinfold caliper (biceps, triceps, subscapularsuprailliaca). Components of somatotype included skinfold measurement, bone width and body's circumference. The results were formulated using Heath-Carter's formula. Percentage of body fat men athletes 75% "excellent"; 25% "good"; women athletes 42.86% "enough"; 42.86% "more" and 14.29% "excellent". The mean of male somatotypeathletes was ectomorphic-mesomorph; and femaleathletes was mesomorph-endomorph. There was a significant relationship between %BF with endomorphy component ( $r=0.881$ ). There was a significant relationship between %BF with endomorphy component. Higher %BF made endomorphy component of the athletes become higher.

**KEYWORD:** body fat percentage, somatotype, combative sport, pencaksilat

## INTRODUCTION

Pencak silat is a traditional Indonesian martial art rooted in Malay culture[1]. This kind of sport competed at national and international levels[2]. The achievement of pencaksilat at combative class was unsatisfactory at the SEA Games 2007. Indonesian national teams are only able to achieve three gold medals[3]. This condition is left behind by the national team of Vietnam and Malaysia that they were able to achieve six and three gold medals[4].

The efforts to improve the achievement of pencaksilat should be done continuously with good talent scouting gradually from the local level, as well as the assessment of the performance of athletes. Athlete's performance is affected by a combination of genetic factors, motivation, exercise, nutrition, nutritional status, health status, somatotype, and fitness [5,6,7]. Assessment of nutritional status periodically required to improve the performance of athletes. It is directly measured by anthropometry and not directly measured by the assessment of food intake. Performance athletes also closely related to body stature. Every athlete has physique and body fat specific to the sport that was involved[8,9]. Body fat deposits will increase the athlete's weight and affects the human body posture. Fat deposits do not contribute to energy production which are very detrimental to the sport with weight classification that maximize muscle mass and minimize fat[9,10], such as martial arts. The higher percentage of body fat and more endomorphy cause athlete's agility is reduced[11]. Agility contribute 20 percent of the fighter's physical condition[12]. Without having a combination of speed, balance and agility, the fighters will be difficult to attack and defend accurately and quickly[13].

Research and publication about correlation between percentages of body fat with somatotype in pencak silat combative class athletes in regional training (PELATDA) Daerah Istimewa Yogyakarta has not been done. Therefore, this research was conducted with the hope of becoming an athlete's performance level study of the regional level and can be considered up to the national level.

## RESEARCH METHOD

This research is a cross sectional analytic study with observational design. The purpose of the study was to determine the relationship between body fat percentages with somatotype in pencak silat combative class athletes PELATDA DIY. The study was conducted in several places. Data collection of basic characteristics was performed at the of the Martial Arts Hall School of Sport Science, Yogyakarta State University (FIK UNY). Data collection of percentage body fat and somatotype performed in Sports Performance Laboratory and Research Center FIK UNY.

The population of this research is pencak silat combative class athletes PELATDA DIY with age 17-30 years old. They had to actively practice over the last month and no injuries when the measurement took place. The sample of this study was the total population, it was 15 people. Pencak silat combative class athletes PELATDA DIY are athletes who has gained the gold medal and joined the training center at the regional level. At least, He/she has represented DIY on a regional or national competition.

The percentage of body fat is body fat weight compared to the total weight. It was measured by skinfold caliper that measure the thickness of body fat under skin folds. Calculations derived from skin folds biceps, triceps, subscapular and suprailiac calculated using the formula [14]. Somatotype is classified into one's body type endomorphy, mesomorphy, ectomorphy; all three components are represented in the same order and cannot stand alone. The components include skinfold measurements (triceps, subscapular, supraspinal, calf), bone width (humerus biepicondilar and femur biepicondilar) and the body circumference (calf circumference and maximum arm circumference). The instruments that used were digital scales, stadiometer, metline and spreading caliper. The results are formulated using the formula and plotted using somatochart [6].

Analysis of the relationship between percentage of body fat and somatotype component of athletes using Spearman correlation analysis. The election of this analysis was made because the sample size is less than fifty [15].

## RESEARCH RESULTS AND DISCUSSION

The respondents of this study are 15 athletes consist of 8 male athletes and female athletes. The ages  $\geq 20$  years were 9 people (60%) and  $<20$  years were 6 people (40%). The average weight of male athletes was  $61.90 \pm 9.97$  kg and female athletes was  $55.24 \pm 7.88$  kg. The highest achievement they had is national champion (73.30%) and regional champion (26.70%).

**Tabel 1. The Calculation of Body Fat Percentage<sup>[14]</sup>**

Component	Formula	
	women	men
Body Density	Age 17-19 years old	Age 17-19 years old
	$D = 1,1549 - 0,0678 \times (\log \Sigma)$	$D = 1,620 - 0,0630 \times (\log \Sigma)$
	Age 20-29 years old	Age 20-29 years old
	$D = 1,1599 - 0,0717 \times (\log \Sigma)$	$D = 1,1631 - 0,0632 \times (\log \Sigma)$
Fat Mass (kg)	$= \text{weight (kg)} \times [(4,95/D) - 4,5]$	
Body Fat Percentage (%)	$= \text{fat mass (kg)} / \text{weight (kg)} \times 100\%$	

Note:

D =Body density

$\Sigma$  = sum of *biceps*, *triceps*, *suprailiac*, *dansubscapula skinfold* measurement

**Tabel 2. Norm of Body Fat Percentage Level by Sex<sup>[16]</sup>**

Body Fat Percentage Level	Percentage (%)	
	Women	Men
Less	<10.00	<5.00
Excellent	10.00-15.99	5.00-10.99
Good	16.00-19.99	11.00-14.99
Enough	20.00-24.99	15.00-17.99
More	25.00-29.99	18.00-20.99
Fat	>30.00	>25.00

**Tabel 3. Somatotype Component Formula<sup>[6]</sup>**

No	Component	Somatotype Formula
1	<i>Endomorphy</i>	$= \frac{[-0,7182 + 0,1451(X) - 0,00068(X^2) + 0,0000014(X^3)]}{170,18 / \text{tinggibadan (cm)}} \times$ <p>Note : X = sum of three skinfolds (<i>triceps</i>, <i>subscapular</i>, <i>dansupraspinale</i>)</p>
2	<i>Mesomorphy</i>	$= 0,858 \times \text{humerusbiecpicondilar (cm)} + 0,601 \times \text{femur biecpicondilar (cm)} + 0,188 \times [\text{maximum arm circumference (cm)} - \text{triceps skinfold (mm)/10}] + 0,161 \times [\text{calf circumference (cm)} - (\text{calf skinfold mm/10}) - 0,131 \times \text{height in cm}] + 45$
3	<i>Ectomorphy</i>	$= (0,732 \times \text{HWR}) - 25,58 \quad \text{If HWR} > 40,74$ $= (0,463 \text{ HWR}) - 17,615 \quad \text{If } 39,65 < \text{HWR} \leq 40,74$ $= 0,5 \quad \text{If HWR} = 39,65$ <p>HWR is <i>height weight ratio</i>. It is measured by the formula  <math display="block">\text{HWR} = \frac{tb}{\sqrt[3]{bb}}</math></p>
4	Penentuan Koordinat	$X = \text{ectomorph} - \text{endomorph}$ $Y = 2 \times \text{mesomorph} - (\text{endomorph} + \text{ectomorph})$

**Tabel 4. Characteristics of PencakSilat Combative Class Athletes PELATDA DIY**

Characteristics	Kriteria	Frekuensi	
		Jumlah (n)	Persentase (%)
Sex	Women	7	46,70
	Men	8	53,30
	Total	15	100,00
Age	≥20 years	9	60,00
	<20 years	6	40,00
	Total	15	100,00
Body Mass Index	<18,5	1	6,67
	18,5-22,9	12	80,00
	≥23,0	2	13,33
	Total	15	100,00
The Highest	National Champion	11	73,30

Achievement	Regional		
	Champion/representative	4	26,70
	Total	15	100,00

**Tabel 5.Characteristics of PencakSilat Combative Class Athletes PELATDA DIY**

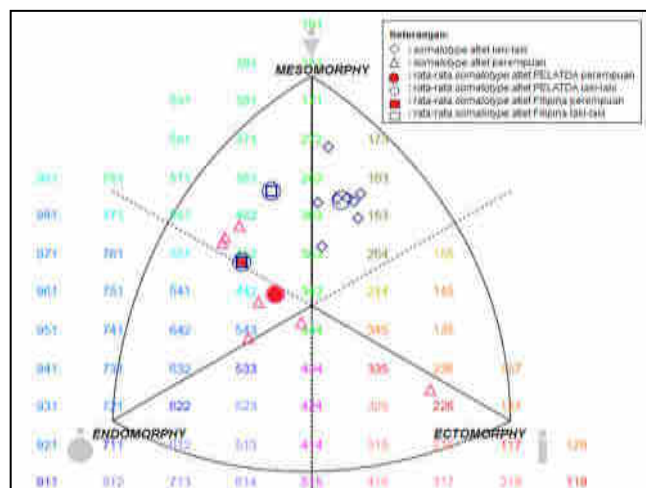
Characteristics	n	Mean±SD	
		Men	Women
Weight (kg)	8	61,90±9,97	55,24±7,88
Height (cm)	8	168,55±8,64	161,81±6,52
Duration of practicing pencaksilat (th)	8	10,25±3,62	8,57±3,26
Frequency of exercise per week	8	6,75±2,31	10,00±1,29

**Tabel 6.Body Fat Percentage and Somatotype by Sex**

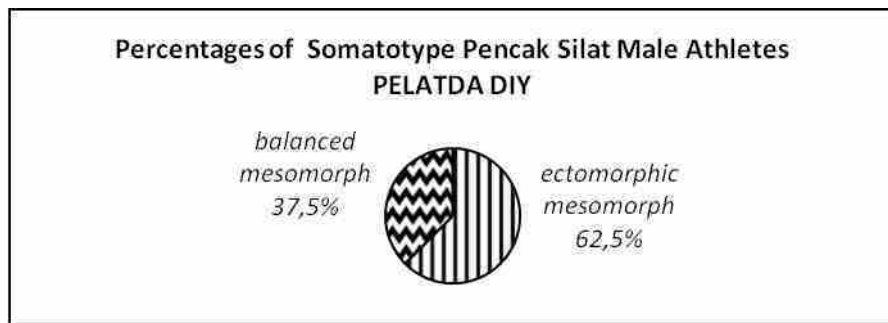
Somatotype Component	Men (n=8)		Women (n=7)	
	Min-Max	Mean±SD	Min-Max	Mean±SD
<b>Body Fat Percentage (%)</b>	6,8-13,1	9,44±2,39	13,4-26,9	23,05±4,47
<b>Somatotype</b>				
Endomorphy	1,5-2,0	1,81±0,37	1,5-4,6	3,71±1,60
Mesomorphy	4,3-6,0	5,01±0,42	1,1-5,1	3,47±1,50
Ectomorphy	2,1-3,0	2,70±0,37	1,8-5,1	2,61±1,19



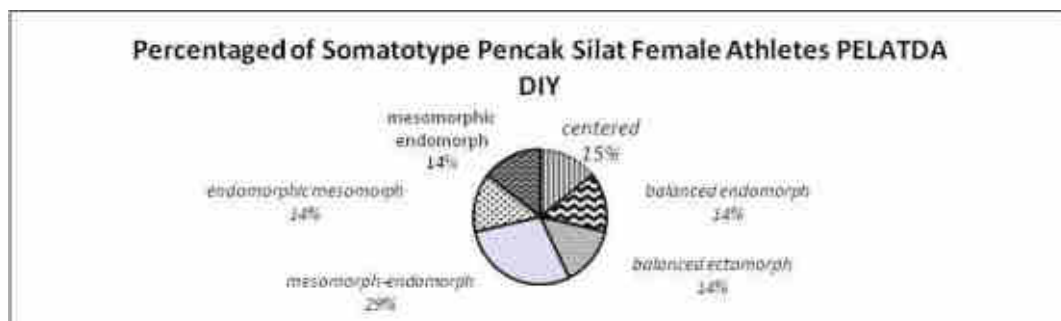
**Figure 1. Bar Chart Body Fat Percentage Level of PencakSilat Athletes**



**Figure 2. Somatotype of PencakSilat Athletes male and female in somatochart**



**Figure 3. Pie Charts the Percentage of Somatotype Male athletes PencakSilat PELATDA DIY**



**Figure 4. Pie Charts the Percentage of Somatotype Female athletes PencakSilat PELATDA DIY**

**Table 7. Correlation between percent body fat and somatotype (n = 15)**

Variabel		KomponenSomatotype		
		Endomorphy	Mesomorphy	Ectomorphy
PersentaseLemakTubuh	r	0,881	-0,297	-0,483
	p	0,000	0,282	0,068

\* UjiSpearman Correlation, signifikanjika  $p < 0,05$ .

### Body Fat Percentage

Based on the survey results, it revealed that the average body fat percentage for male athletes is  $9.44 \pm 2.39\%$  and women is  $23.05 \pm 4.47\%$ . The mean body fat percentage of men is lower than women (Table 6). The body fat percentage of male athletes range in the level of “excellent” (75%) and “good” (25%); whereas female athletes in the “enough” and “more” levels each (42.86 %) and “excellent” (14.29 %) either once. Male athletes have better levels of body fat percentage than female athletes (Figure 1). This is consistent with the theory that there is difference in body composition in men and women known as sexual dimorphism[17]. The differences are starting to look more at the time of puberty. Women store more body fat and men form a larger muscle tissue[18]. The result of this research study according to the research studies on judo athlete who also showed that the male has a height, humerus breadth, body density and fat free mass is higher than women[19]. Nevertheless, there are differences in the



level of body fat percentage results between men and women. It can be happened because of the accuracy and precision of measurement of skin folds that are influenced by the measuring skill, type skinfold caliper and subject factors[20]. In addition, the difference might be due to the level of skinfold formula measurement has an error of 3% in predicting the body fat percentage[18].

Sport of pencak silat competed using weight classification[21]. Athletes tend to compete in lower class weight[22] and assume that the higher weight is more favorable[23]. Athletes assume that higher body weight followed by a high muscle mass and low body fat. Higher muscle mass serves to maximize power and strength. Excessive body fat is not profitable and be a burden because it makes the body movements more sluggish and inefficient [18,24].

### ***Somatotype***

Based on the results of the study, the mean of endomorphy component higher in women than men; mesomorphy components higher in men than women (Table 6). This is due to body composition differences in gender determines the discrepancies somatotype[25,26] and is known as somatotype sexual dimorphism. Similar conditions occurred in previous studies with the subject of judo athletes[19].

The highest percentage of somatotype in male athletes is ectomorphic mesomorph (62.5%) and the remaining is balanced mesomorph (37.5%)(Figure 3); whereas female athletes are a mesomorph-endomorph (29%) and the rest is divided evenly on centered, balanced endomorph, ectomorph balanced, endomorphic mesomorph, endomorph mesomorphic (14%) respectively (Figure 4).

The mean of somatotype male athletes are 1,8-5,0-2,6 (Table 6) were classified as ectomorphic mesomorph. Ectomorphic mesomorph means that mesomorphy significantly more dominant followed by ectomorphy then endomorphy. It suggests that the degree of muscular and skeletal more dominant then followed with a degree of slimness after that degree of fat deposits in athletes. Individuals with mesomorphy has features particularly strong muscles of the arms and thighs; minimal amount of body fat; and superior in strength, agility and speed. These individuals tend to be able to increase muscle mass and strength with ease; in addition it has a good response to the ability of the cardiovascular and endurance during practice. Individuals with ectomorphy have characteristics, namely: tall, lean, and lanky. This individual has a bit of muscle and body fat as well as thermoregulation both very important in endurance-based sport. These individuals become more nimble with minimal body fat and dominate the endurance sports and exercise[27].

The combination of these two components of body types according to the sport of martial arts. Minimum body fat will help the adjustment to the weight class athletes. The advantage is mesomorphy athletes have a higher lean body mass so as to maximize the power and strength[24]. In addition, athletes with mesomorphy and ectomorphy had a good response to the aerobic energy system that underlying anaerobic alactic capacity building for supporting athletes during the match[14].

The mean somatotype of female athletes is 3,7-3,5-2,6 (Table 6) were classified as mesomorph-endomorph. Mesomorph-endomorph means that mesomorphy and endomorphy have the equal value in dominant followed by ectomorphy that lower to the others. This indicates that female athletes have a predominance of skeletal muscle degrees and fat deposits degrees in the same rank and followed by slimness degree with a lower rank. Individuals with endomorphy have body fat, especially on the upper arms and thighs[27].

The combination of these two dominant components according to the pencak silat combative class. Athletes with mesomorphy have ability in endurance with a good aerobic system as the basis for improved performance on the anaerobic system[14]. Athletes with mesomorphy also have a high lean body mass to maximize strength and power[24]. Individuals with endomorphy have body fat in the arms and thighs, this condition is also beneficial in sports with body contact with fat as the protection the organs in the body[18,28] when the impact occurred during the match.

The combination of somatotype components in male athletes and female athletes in accordance with the study of PencakSilat PELATDA DIY pre PON 2003 which says that the domination mesomorphy body type has the potential to pencaksilatcombative category[29]. The results of the research approach mesomorphy body type according to the research on elite PencakSilat athletes in the Philippines[30]; Botswana national Karate athletes [31]; and German elite taekwondo athletes [32].

### **Body Fat Percentage Relationship with Somatotype**

The results showed that there is a significant correlation between the percentage of body fat with endomorphy component ( $p < 0.05$ ). Both of them have a very strong relationship closeness with the positive pattern with a correlation coefficient of  $r = 0.881$ . It means that any increase in the percentage of body fat then endomorphy components will also increase. Nevertheless, the relationship between body fat percentage and mesomorphy components showed no significant relationship ( $p > 0.05$ ) with a negative pattern and the relationship is weak ( $r = -0.297$ ). Relationship of body fat percentage and ectomorphy component showed a non-significant relationship ( $p > 0.05$ ) with the positive pattern of the relationship and the strength of the relationship ( $r = 0.483$ ) (Table 7).

Significant correlation between body fat percentage and endomorphy components in accordance with the theory that the body's somatotype is a description of the morphology and adjustment in individuals. Endomorphy component is a description of the body fat stores degree, which the section apart fatty deposits were formed. Endomorphy component calculated by assessing the relationship component that is measured using a number of measurements of three skin folds, relative to the subject's height. Three folds of skin that is used is the triceps skin fold, subscapular and supraspinale [33,34].

No significant relationship between the body fat percentage and mesomorphy components. It is according to the theory that describes the mesomorphy components developed by skeletal muscle in the body. Although these components have characteristics that minimal body fat, other factors influence the measurement mesomorphy components [27,33,34].

The relationship between body fat percentages and ectomorphy components was not significant but has a close relationship being on the corresponding theory that ectomorphy describes the degree of slimness parts of the body. Similar with mesomorphy components, ectomorphy component has little body fat. Nevertheless, it is needed the other factors that determine the value of ectomorphy component. The value of ectomorphy component estimated by the relationship between the value of the components of the weight height ratio [26,33,34].

The results of this study are consistent with the other research that says the dominant endomorphy have more fat, fat free weight, and body cell mass than ectomorphy. Mesomorphy dominant has free fat weight greater than ectomorphy. Ectomorphy dominant has at least free fat cell mass and body weight less than endomorphy and mesomorphy [35]. Endomorphy dominant has very strong, powerful and meaningful relationships between obesity and body fat weight; whereas endomorphy with free fat weight has a significant relationship but the closeness relationship was moderate. This study states that only endomorphy and ectomorphy which is a strong predictor of body composition [36].

### **CONCLUSION AND SUGGESTION**

The higher body fat percentage of athletes makes the body getting more endomorphy. Reliability test should be performed on the data enumerators before taking the body fat percentage and somatotype.

### **ACKNOWLEDGMENT**

This research was funded by the Lecturer Student Collaboration Grant with funded by grants BOPTN LPPM and Nutrition Lecturer Grant of Medical Faculty UGM. This research

was made possible through the support of Mr. Awan Hariono, M.Or; Regional Board Indonesian PencakSilat Association Special Region of Yogyakarta (PENGDA IPSIDIY); PencakSilat Student Activity Unit, State University of Yogyakarta; and the Sport and Performance Laboratory Faculty of Sports Science, Sport Faculty Yogyakarta State University.

## REFERENCES

- [1] Gunawan, GA. 2007. *Teks dan Ilustrasi Beladiri*. Editor: FA Muhamad. Yogyakarta: Insan Madani
- [2] Nenggala, AK. 2006. *Pendidikan Jasmani, Olahraga dan Kesehatan untuk Kelas VII SMP*. Jakarta: Grafindo Media Pratama. Pp.43-45
- [3] Humas Satlak PRIMA. 2011. *Pencak Silat Juara Umum* [Internet]. Available at <<http://www.satlakprima.com/news/pencak-silat-juara-umum-dengan-9-emas/>> [Accessed Nov 17<sup>th</sup> 2011].
- [4] Anonim, 2011. *Tim Pencak Silat RI borong Medali SEA Games ke-26*. [Internet]. Available at [www.tvonenews.tv](http://www.tvonenews.tv) [Accessed July 5<sup>th</sup> 2012].
- [5] Sport Medicine Manual. 2000. *Physiology*. IOC Sport Medicine Manual 2000 [Internet]. Available at [www.olympic.or.id](http://www.olympic.or.id) [Accessed July 28<sup>th</sup> 2012]
- [6] Carter, J.E.L. 2002. *The Heath-Carter Anthropometric Somatotype Instruction Manual*. Sandiego: CA. USA Department of Exercise and Nutritional Sciences, pp.1-26
- [7] Dorfman, L. 2008. Nutrition for Exercise and Sport Performance. In Mahan, L. K. and Stump, S. E. 2008. *Krause's Food and Nutrition Therapy 12<sup>th</sup> edition*. USA: Elseviere, pp.588-590.
- [8] Rahmawati, NT. 1996. Beberapa Ukuran Antropometri pada Atlet Sepak bola dan Bulutangkis di Yogyakarta. *Berkala Ilmu Kedokteran*. Volume: 28 (2), pp.72-78.
- [9] Fatmah & Ruhayati, Y. 2010. Gizi Kebugaran dan Olahraga. Bandung: Lubuk Agung, pp.35-50
- [10] Tooth, K. 2007. Physical Activity, *Somatotype* and Body Composition. *Summer School of the European Anthropology Association*. Vol(1)11, pp.97-201.
- [11] Norton, K., Olds, T., Olive, S., Cray, N. 2004. Anthropometry and Sport Performance. In: Norton, K. and Olds, T. 2004. *Anthropometrica : A textbook of body measurement for sport and health courses*. Sydney: University of New South Wales Press, pp. 332.
- [12] DIKPORA DIY. 2005. *Pemanduan Atlet Berbakat Daerah Istimewa Yogyakarta*. [unpublished]
- [13] Hariono, A. 2006. *Metode Melatih Fisik Pencak Silat*. Jurusan Pendidikan Kepratihan Olahraga Universitas Negeri Yogyakarta, pp. 25-42.
- [14] Womersley, D.1974. Body Fat Assesement from Total Body Density and Its Estimation From Skinfold Thickness Measueremnt on 481 man and woman aged 16-72 years. *British Journal Nutrition* 32, pp. 77-97.

- [15] Dahlan, M. Sopiudin. 2011. Statistik untuk Kedokteran dan Kesehatan. Deskriptif, Bivariat dan Multivariat Dilengkapi Aplikasi dengan Menggunakan SPSS. Jakarta: Salemba Medika, p.169-179.
- [16] Subagyo. 2007. Pengaruh Kekuatan Lengan, Ketebalan Lemak dan Body Mass Index terhadap Prestasi Renang Gaya Crawl 50 meter. *Majalah Ilmu Faal Indonesia*. Vol. 6 (2), pp. 120-128.
- [17] Wells, JCK. 2007. Sexual dimorphism of Body Composition. In: *Journal of Best Practice and Research Clinical Embriologi and Metabolism* Vol:21 (3): 415-430. William, MH. 2005. *Nutrition for Health, Fitness, and Sport* 6<sup>th</sup>ed. New York:McGraw-Hill, pp.384-387.
- [18] Sterkowicz, P &Almansba, R. 2011. Sexual Dimorphism of Anthropometrical measurements in Judoistsvs untrained subject. *Journal Science and Sports*Vol 26, pp 216-323.
- [19] Heyward, VH. 2008. Assesing Body Composition. In: *Advanced Fitness Assesemant and Exercise Prescription*. Unites States of America: Human Kinetics, pp.187-191.
- [20] Munas IPSI XII. 2007. *Peraturan Pertandingan Pencak Silat Ikatan pencak Silat Indonesia*. Hasil Keputusan Munas IPSI XII 20-24 Agustus 2007. Jakarta: IPSI
- [21] Wilmore, JH. Weight Category Sports Chapter 49. In: *Nutrition in Sport Volume VII of The Encyclopedia of Sports Medicine IOC Medical Commission Publication In Collaborate with Internastional Federation of Sports Medicines*. Edited by Ronal J, pp. 637-644.
- [22] Purba, M.B. 2007. Pengaruh Kebiasaan Makan Terhadap Prestasi Atlet Prosiding Seminar Nasional Gizi dan Olahraga dengan tema “Peranan Gizi Untuk Meningkatkan Prestasi Olah Raga Bangsa Indonesia”. Prodi Gizi Kesehatan FK-UGM.
- [23] Burke, L & Cox, G. 2010. *The Complete Guide to Food For Sport Performance Peak Nutrition For Your Sport* 3<sup>rd</sup> edition. Crown Nest Australia: Allen &Unwin, pp.356.
- [24] Kalichman, L. & Kobylansky, E., 2006. Sex and Age-Related Variations of TheSomatotype in A Chuvasha Population. *Journal Homo of Comparative Human Biology*, Vol 57, pp. 151-162.
- [25] Rahmawati, NT. Janatin, H., Kumi, A., 2008. Age-related variation on Somatotypes of Javanese people ini DIY. *Berkala Ilmu Kedokteran*, Vol 40(4), pp. 181-188.
- [26] Mackenzie, B. 2001. *Body Types and Build* [Internet] Available at: <http://www.brianmac.co.uk/bodytype.htm> [accessed July 12<sup>nd</sup> 2012]
- [27] McArdle, WD., Katch, FI.,Katch, VL. *Exercise Physiology. Energy Nutrition and Human Nutrition*. United States: Lippincot William and Wilkins, pp. 19-28.
- [28] Asiyah, GN. 2003. *Somatotype PesilatPelatdapra PON Daerah Istimewa Yogyakarta*.

[Skripsi] UNY.

- [29] Pieter, W & Luigi TB. 2009. *Brazilian Journal of Biomotricity*. Somatotype of National Elite Combative Sport Athletes. Department Physical Education, University of Asia and the Pacific, Pasig City Philippines. Vol 3(1), pp.21-30.
- [30] Amusa, L.O. & Onyewadume, I.O., 2001. *Anthropometry, Body Composition and Somatotypes of Botswana National Karate Player: A Descriptive Study*. Department of Physical Education, Health and Recreation, University of Botswana, pp.8-14.
- [31] Fritzsche, J. & Raschka, C. 2008. Body Composition and The Somatotype of German Top Taekwondo Practitioners. *Papers on Anthropology XVII*, pp. 58-71
- [32] Indriati, E. 2010. *Antropometri untuk Kedokteran, Keperawatan, Gizi, dan Olahraga*. Yogyakarta: Citra Aji Pratama, pp. 120-134.
- [33] Duquet, W & Carter, JEL. 2009. In: Eston, R. and Reilly, T. (Ed). *Kinanthropometry and Exercise Physiology Laboratory Manual. Anthropometry 3<sup>rd</sup> ed*. Routledge, New York. 1(3).
- [34] Bolonchuk, W.W., Siders W.A., Lykken, G.L., Lukaski H.C. 2000. Association of dominant somatotype of men with body structure, function during exercise, and nutritional assessment. *American journal of human biology: the official journal of the Human Biology Council*, Vol 12(2), pp. 167–180.
- [35] Bulbulian R. 1984. The Influence of Somatotype on Anthropometric Prediction of Body Composition in Young Women. *Medical Science Sport Exercise* Vol 6, pp. 389–397 In: Bolonchuk, W.W., Siders W.A., Lykken, G.L., Lukaski H.C. 2000.
- [36] Association of Dominant Somatotype of Men With Body Structure, Function During Exercise, and Nutritional Assessment. *American Journal of Human Biology: The Official Journal Of The Human Biology Council*, Vol 12(2), pp. 167–180.

# THE ANALYSIS OF THE PHYSICAL CONDITION, WILL PENCAK SILAT CONSTRUCTION TRAINING CENTER STUDENTS (PPLP) OF WEST SUMATRA

Nurul Ihsan

Padang State University, Indonesia

## Abstract

The purpose of this research for the situation to know with physical condition silat athletes PPLP West Sumatera in 2012 . Sample in this research is all the athletes PPLP West Sumatera 2012 filter estimated 20 people. Instruments incorrect dipergunakan in this research is using tests with the physical condition filter direkomendasikan get a team consultant physical conditions that occur West Sumatera filter consists of 4 items on behalf of tests (endurance, endurance strength, speed and power) . Mechanical analysis done with the data using the following formula  $P = F / N \times 100$  . From the results of the analysis of data about the leg muscles power athletes : News category of 1 people ( 5 % ) , Just by 7 people ( 35 % ) , while the category of 7 people ( 35 % ) and low categories of 5 people ( 25 % ) . Data speeds Implementation of the results of this study , good spare room of 2 ( 10 % ) , News of 4 people ( 20 % ) , category Enough of 6 people ( 30 % ) , while the category of 3 people ( 15 % ) and the category of Least 5 People ( 25 % ) . Data about the results of this study are resistant strength athletes , ( Push - Up ) athletes are of the same category News 1 people ( 5 % ) , while of 13 people ( 65 % ) , the category of Least 5 people ( 25 % ) and less spare category of 1 people ( 5 % ) . ( Sit - Up ) athletes are of the same category, while 3 people ( 15 % ) , of less than 15 people ( 75 % ) , and less spare category of 2 people ( 10 % ) . Data about the results of this study were athletes VO2 Max category News spare of 1 people ( 5 % ) of the 16 Good people ( 80 % ) , while of 3 people ( 15 % ) .

## INTRODUCTION

Exercises activities have some specific aims. Sajoto in Gusril (1992) states that the aims of doing exercise include (1) the educational purpose, (2) the recreation purpose, (3) healthy purpose and (4) achievement purpose. There are two factors which influence the achievement of an athlete in a competition; they are external and internal factors. Internal factor is the factor which emerges from the individual him/herself, that is the athlete's potency which influences the achievement. In the other hand, external factor is the factor which emerges from the environment around the individual such the trainer, facilities, food, etc. Syafruddin (2011) explains that there are four components that need to be considered in achieving specific goals, physical condition, techniques, tactics, and psychical condition. These four component are related each others.

One of the internal factors which influence the athlete's achievement is physical condition. Physical condition is an athlete's basic requirement, since it influences the athlete's ability in mastering certain technique or tactics in a competition. In order to master certain techniques or tactics, an athlete should have excellent physical condition. So, he/she is able to do kicking, hitting, avoiding and throwing techniques.

Based on the theoretical concept about the physical condition, it can be assumed that physical condition is really important in martial arts (*pencak silat*) achievement. Furthermore, based on the previous experience, it can be concluded that one of the reasons which leads the athlete to a failure is the bad physical condition. Thus, it is an important thing to consider more about the physical condition of an athlete.

Physical condition is an important thing for a learner since it is a basic foundation to master techniques, tactics, strategies and psychical condition. A complex drilling technique and intensive tactic is a way to improve a complex physical condition. The significance of a good

physical condition is achieving a good prestige, having better healing process, avoiding bad psychical condition, having good concentration, and improving self confidence.

Basically, physical condition is necessary for exercise which aims at the achievement purpose. It is due to the physical condition influence the quality and the learner's ability to achieve optimal prestige. Thus, it needs a help of an experience and knowledgeable trainer and a scientist which are professional in physical exercise area. It is because the training of physical condition needs supporting knowledge in order to reach the goals.

Physical condition can be defined as physical situation. It include the physical condition before and after doing certain exercise (syafuruddin, 1994). In other words, it means that physical condition is not only the condition during the activities, but also the condition before, during and after doing the exercise activities. Thus, a physical condition training is designed systematically to improve optimal physical condition. It can be done by doing regular training.

Physical condition consists of related components which can be apart one to another. It means that, in attempting to improve good physical condition, all the components should be well-developed and improved too. However, it still needs a consideration to decide what, when and where the specific components should be improve more than others. It will be clearer when it comes to the level of physical condition status (Sajoto, 1990: 16).

By having physical training, it can be assumed that the body system is changed. The changes are caused by the adaptation. The adaptation can be realized if the activities are done regularly and gradually. The characteristics of the adaptation are (1); the improvement of physiology ability such as better respiration, heart, lungs, blood circulation and blood volume, (2) the improvement of physical ability such as muscle endurance, strength and power, (3) the improvement of the ligament, tendon, and any muscle tissue. Then this article will discuss about the principles of exercise activities.

1. Physical condition components

The physical component consists of two components (Bompa, 1990: 29), they are physical health and movement health. The physical health includes (1) muscle health, (2) cardiovascular health, (3) the balance of body volume, and (4) elasticity health. Movement health includes (1) movement coordination, (2) balance, (3) speed, (4) agility, and (5) exclusive power.

Besides, there are two components which are categorized as physical condition components, (1) accuracy and (2) reaction. If the movement component is included in agility, so there are 10 components which are categorized in physical condition which can be tested in one test.

2. The physical condition of Pencak Silat

Pencak silat is one of martial arts. In sports classification, pencak silat is categorized as immeasurable sport. It means that a sport which its effects cannot be predicted. It is different with measurable sport in which it has predictable demand. For example, the speed. Pencak silat is a sport which includes full body contact. It means that the athlete must face each other. In achieving point, the athlete should attack (hit or kick) to the body protector of the opponent.

There are some aspects to be considered about the physical condition of pencak silat. They are (1) the energy system, (2) the techniques used and (3) the competition rules. Through energy system, the physical condition needed can be detected. Through techniques used, the physical condition to do the techniques can be predicted, through the competition rules, the way to get the points can also be seen.

- a. The energy system.

In a pencak silat competition, the competition consists of three phase. Every phase is done in two minutes (without referee stop) and every phase is given a break time for 1 minute. Thus time needed for one competition is 6 minutes plus two minutes for break time. Based on the time needed, pencak silat is categorized as an aerobic energy system. Besides, base on the movement in pencak silat (during the attack time) and the rule of competition, an athlete is only allowed to attack four times. So, the average time to do

every attack is about 2-3 seconds. Thus, it is also the reason why pencak silat is categorized as an aerobic energy system.

Based on the rules above in which there is only 2 minutes for each phase, an athlete should be able to do qualified and recurrent attack to get the points. In accordance with the rules, the attack which is given a point is an attack that is strong, quick, accurate, supported timber, accurate attack space without being avoided by the opponents by defense or avoidance.

Based on the energy system used above, it can be concluded that the physical condition needed in pencak silat is body defense, whether the cardiovascular or muscle.

b. The techniques used

Based on the allowed techniques used in a pencak silat competition, all of the basic techniques of pencak silat can be used in the competition. It is stated in the rule that the attack which is marked is an attack that is strong, powerful, accurate and unblocked. If the technique used is the attack point and capture technique (hand and feet), so all of these techniques should be done fast, accurate and powerful. Thus, the physical condition needed is the strength, speed, agility, exclusive power, balance and coordination.

c. Competition rules

As stated above that in pencak silat competition that every competition consists of three phases. Every phase is done in two minutes (without referee stop) and every phase is given break time for 1 minute. The total time needed then is about 6 minutes plus 2 minutes for break time. The attack which is marked is an attack that is strong, powerful, accurate and unblocked. Thus, to fulfill the rules, the physical conditions needed in pencak silat is the body defense, strength, speed, agility, flexibility, exclusive power, balance and coordination.

## RESEARCH METHODOLOGY

This research was a descriptive research. the purpose of this research is to know the level the physical condition of PPLP Pencak Silat athlete of West West Sumatera province in 2012. The population of this research is the PPLS Pencak Silat Athlete of 2012 as much as 20 athletes. The sampling techniques used in this research was total sampling. Thus, the samples of this research were 20 athletes.

The instrument used in this research was physical condition test which was designed based on the need of pencak silat field. In this case, the arranged test used was the test recommended by the experts suggested by KONI Sumatera Barat. The components tested were the speed, exclusive power, strength, knee-muscle defense, and aerobic defense.

Based on the purpose of this research, the technique to analyze data used was the descriptive data analysis by using percentage formula:

$$P = f/N \times 100\%$$

Where:

P = Percentage

F = Frequent

N = Total Sample

## RESEARCH FINDING AND DISCUSSION

The data collected was analyzed by using the formula above. below is the analysis of the physical condition of PPLP Pencak Silat Athlete of West Sumatera in 2012.

1. The exclusive power of knee-muscle of PPLP Pencak Silat Athlete of West Sumatera 2012.

Based on the data collected, it was found that the exclusive power of knee-muscle was categorized Good as much as 1 athlete (5%), Enough as much as 7 athlete (35%), Average as much as 7 athlete (35%) and Bad as much as 5 athlete (25%).



In Pencak silat competition, exclusive power is really needed especially in knee-muscle for kicking. A pencak silat athlete should stand in a good stance. If an athlete has a good stance, he is able to swing the leg and produce a good attack (kicking) which is fast and accurate to get a point. As the consequences, a pancake silat athlete should has a good explosive power in knee-muscle in very good and good category. If the exclusive power is on enough or bad category, the athlete cannot produce a powerful attack to get the point and are easy to be caught by the opponent.

2. The speed of the PPLS Pencak Silat Athlete of West Sumatera 2012.

Based on the data collected, it was found that the speed of the athlete in very good category was as much as 2 athlete (10%), good as much as 4 athletes (20%), enough as much as 6 athletes (30%), average as much as 3 athletes (15%) and bad as much as 5 athletes (25%).

In a competition, the athlete should produce a quick movement whether for the attack or in defense. If an attack is not produced quickly, it can be predicted and caught by the opponents easily. The same goes in defense movement in which the athlete should avoid and defend quickly to protect the whole body from the opponent's attacks.

3. The strength endurance of the PPLP Pencak Silat Athlete of West Sumatera 2012.

Based on the data collected, it was found that the strength (push-up) of the athlete in good category was as much as 1 athlete (5%), average as much as 13 athletes (65%), bad as much as 5 athletes (25%) and very bad was as much as 1 athlete (5%).

The strength is a must for a pencak silat athlete. It is because one competition consists of three phases in which each phases is given 2 minutes. In this limited time, an athlete should attack, defense, etc. thus, a less powerful athlete may find difficulties during the competition.

4. The endurance of the PPLP Pencak Silat Athlete of West Sumatera 2012.

Based on the data collected, it was found that the VO2 max of the athlete in very good category was as much as 1 athlete (5%), good as much as 16 athletes (80%), average as much as 3 athletes (15%).

If a pencak silat athlete posses a good VO2 Max ability, the athlete will have good body condition and endurance. Thus, the athlete will not feel exhausted easily. If an athlete does not have a good VO2 max ability, the athlete cannot compete for the three phases optimally.

## CONCLUSION

Based on the research findings about “the analysis of Physical condition of PPLP Pencak Silat Atheletes of West Sumatera 2012”, it can be inferred that:

1. Based on the data analysis and description of research findings about the exclusive power of knee-muscle, it was found that the exclusive power of knee-muscle was categorized Good as much as 1 athlete (5%), Enough as much as 7 athlete (35%), Average as much as 7 athlete (35%) and Bad as much as 5 athlete (25%).
2. Based on the data analysis and description of research findings about the speed, it was found that the speed of the athlete in very good category was as much as 2 athlete (10%), good as much as 4 athletes (20%), enough as much as 6 athletes (30%), average as much as 3 athletes (15%) and bad as much as 5 athletes (25%).
3. Based on the data analysis and description of research findings about the athlete strength endurance (push up), it was found that the strength (push-up) of the athlete in good category was as much as 1 athlete (5%), average as much as 13 athletes (65%), bad as much as 5 athletes (25%) and very bad was as much as 1 athlete (5%). The strength (sit up) of the athlete in average category was as much as 3 athletes (15%), bad was as much as 15 athletes (75%) and very bad category was as much as 2 athletes (10%).
4. Based on the data analysis and description of research findings about the VO2 max of the athlete, it was found that the VO2 max of the athlete in very good category

was as much as 1 athlete (5%), good as much as 16 athletes (80%), average as much as 3 athletes (15%).

## REFERENCE

- [1] Bompa, 1990. *Periodization, Theory And Methodology Of Training*. Fourth Edition. USA: Kendal/Hunt Publising Company.
- [2] Dangsina Moeloek. 1984. *Kesehatan dan Olahraga*. Jakarta. FKUI.
- [3] Gusril. 1992. *Pembinaan Pelatih Olahraga*. Padang. FPOK IKIP Padang
- [4] Jonath/Krepel. 1981. *Praxis Der Leichtathletik*. Berlin  
Moeloek. (1988). *Pembinaan Kondisi Fisik Dalam Olahraga*. Jakarta: P2LPTK Dirjen DIKTI.
- [5] Sahara, Sayuti. 2004. *Biomotorik*. Padang. FIK UNP.
- [6] Sajoto. 1995. *Peningkatan dan Pembinaan Kekuatan Kondisi Fisik Dalam Olahraga*  
Semarang: Dahara Prize  
\_\_\_\_\_. 1990. *Peningkatan dan Pembinaan Kekuatan Kondisi Fisik*. Semarang. Effhar Offset Semarang.  
Syafruddin 2011. *Ilmu Kepelatihan Olahraga: Teori Dan Aplikasinya Dalam Pembinaan Olahraga*. Padang. UNP Press  
\_\_\_\_\_. 1994. *Pengantar Ilmu Melatih*. Padang: FPOK IKIP.

# **UNDERSTANDING “SPORTS HERNIA” (ATHLETIC PUBALGIA) AS A CHRONIC GROIN INJURY in ATHLETES SENDHI TRISTANTI PUSPITASARI**

**Sendhi Trisanti Puspitasari**

**dr.sendhi@gmail.com  
State University of Malang, Indonesia**

## **Abstract**

Recent publicity and some scientific reports suggest increasing success in treating an entity called “sports hernia”, more accurately named athletic pubalgia. These injuries have been plaguing athletes for a long time, and past treatments, based on concepts of occult hernia or simple strains, have generally failed. Groin injuries are responsible for a much larger proportion of time lost from competition and work. Athletic pubalgia has been found in 58% of football players, most commonly in highly skilled positional players, and soccer and ice hockey players but it currently lacks a universally accept. Among male soccer players the incidence of chronic groin pain is 10-18% per year. In sports such as soccer, ice and field hockey, tennis, and Australian Rules football groin injuries may represent 5-7% of all injuries. Many athletes with a diagnosis of “sports hernia” or “athletic pubalgia” have a spectrum of related pathologic conditions resulting from musculotendinous injuries and subsequent instability of the pubic symphysis without any finding of inguinal hernia at physical examination. Organizing patient with sports hernia need a collaboration with other experienced and engaged sports health care professionals, including team trainers, physical therapists, team physicians, and sports medicine and orthopedic surgeons. The condition does not respond well to conservative measures including prolonged rest, with perhaps only 20% returning to full activity. Of the athletes who underwent surgery, 98% have returned to competition. After a minimum of 6 weeks for recovery and rehabilitation, they have usually returned to competition within 3 months.

**Keywords :** sports hernia, groin injury, athletes

## **INTRODUCTION**

Recent publicity and some scientific reports suggest increasing success in treating an entity called “sports hernia”, more accurately named athletic pubalgia. These injuries have been plaguing athletes for a long time, and past treatments, based on concepts of occult hernia or simple strains, have generally failed.(Meyer,2008 garvey,2011)

Sports hernia is a condition that has been poorly understood by clinicians. It is estimated that groin pain occurs in 5% to 28% of athletes. As originally described, sports hernia occurred more commonly in hockey and soccer players, but it is also seen in all sports for a variety of reasons. Although never proven, one commonly mentioned reason for the condition’s frequency is athletes’ shorter off season time to allow for recovery (Preskitt,2011)

In sports such as soccer, ice and field hockey, tennis, and Australian Rules football groin injuries may represent 5-7% of all injuries. Injury data from the National Hockey League reveals that 13-20 out of 100 players per year sustain a groin injury (Caudill,2008)

## **CHRONIC GROIN PAIN OR GROIN INJURIES**

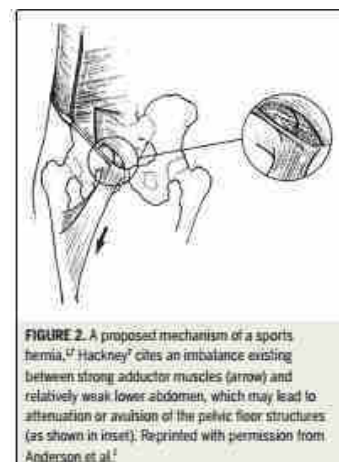
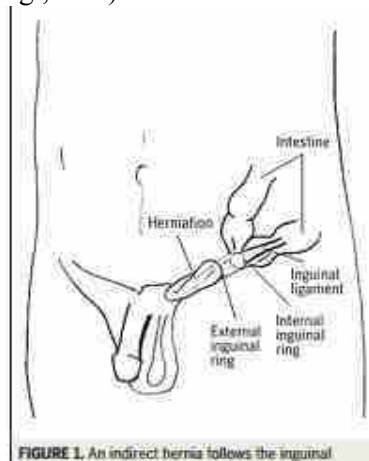
Groin injuries are common in athletes who participate in sports that require twisting at the waist, sudden and sharp changes in direction, and side-to-side ambulation. Such injuries frequently lead to debilitating pain and lost playing time, and they may be difficult to diagnose. (Omar,2008).

Some believe that it is the most common cause of chronic groin pain in athletes, whereas others consider it to be quite rare.Gilmore suggested that the incidence of chronic groin

injury has increased with the greater intensity of modern athletic play. Others however have suggested that the increased injury frequency is more likely attributed to the heightened awareness of athletic trainers and physicians. The groin disruption syndrome described by Gilmore including injury to the internal oblique aponeurosis, conjoined tendon pubic tubercle attachment, and dehiscence between the conjoined tendon inguinal ligament have been grouped together as inguinal wall and superficial inguinal ring disorders. Posterior inguinal wall deficiency occurs as a result of injury to the transversalis fascia or conjoined tendon which is formed by the medial portion of the internal oblique and transverses abdominis muscles. (Caudill,2008)

Chronic groin pain can be caused by ilioinguinal neuralgia, tear of the acetabular labrum, avulsion injury, stress fracture of the femoral neck or pubic bone, sports hernia, periositis, iliopsoas strain or bursitis, obturator nerve entrapment,slipped capital femoral epiphysis, snapping hip syndrome, lumbar spine referred pain and the last genitourinary problems (Hackey,1993;Jans,2012).

Groin pain has long been cited as a common complaint among individuals with a hernia as well.types of inguinal hernias: (1) a direct inguinal hernia, in which a sac formed by the peritoneum, and containing a portion of the intestine, pushes directly outward through the weakest point in the abdominal wall, and (2) an indirect hernia, which travels downward through the internal inguinal ring into the inguinal canal through which the testes descend into the scrotum during infancy (males) or to the labia (females). FIGURE 1 demonstrates the anatomy of an indirect inguinal hernia. The indirect inguinal hernia is most common in infants and adolescents particularly in males because it follows the tract that develops when the testes descend into the scrotum before birth. Of note, an indirect hernia is always anterolateral to the epiga stric vessels, whereas a direct hernia is anteromedial. FIGURE 2, An attenuation or tearing of the transversalis fascia or conjoined tendon has been suggested as the location of anatomic abnormality. Other studies suggest an anatomic abnormality at the insertion of the rectus abdominis, avulsions of the internal abdominal oblique at the pubic tubercle, or anomalies about the external abdominal oblique and aponeurosis could lead to a hernia (Unverzagt,2008).



## SPORTS HERNIA (ATHLETIC PUBALGIA)

Many athletes with a diagnosis of “sports hernia” or “athletic pubalgia” have a spectrum of related pathologic conditions resulting from musculotendinous injuries and subsequent instability of the pubic symphysis without any finding of inguinal hernia at physical examination. (Hackey,1993;Omar,2008)

A sports hernia is a painful musculotendinous injury to the medial inguinal floor caused by and exacerbated by vigorous sport or physical exertion. It is not a true hernia because there is no “herniation” or protrusion of a visceral sac. However, its repair is very similar to that of an inguinal hernia, and the term has become ingrained. Because the term “athletic pubalgia

syndrome” is nearly identical in meaning, the terms are used interchangeably here (Preskitt,2011)

Many reports define a sports hernia as a bulge or incipient posterior inguinal wall hernia that creates lower abdominal or groin pain leading to loss of inguinal canal integrity without the presence of a true hernia. Other sports hernia descriptions have included abnormalities of the rectus abdominis muscle, avulsion of part of the internal oblique muscle fibers from the pubic tubercle, tearing within the internal oblique muscle, or abnormality in the external oblique muscle and aponeurosis. Since each of these conditions may also dilate or weaken the inguinal wall or ring. Anterior inguinal wall defects have also been identified via surgical exploration in up to 80% of athletes who experience chronic groin pain (Caudill,2008)

In the present definition, the “pelvis” or “pelvic floor” portrays just the anterior half of the pelvis. This floor includes the rectus abdominis muscles and tendons, the thigh muscles, and the other stabilizers in the three compartments mentioned above and also the semimembranosus, the sartorius, and the biceps femoris muscle insertions. We think of the latter three muscles as having various functions including strap, flexion, abduction, and lateral rotation functions. In athletes, tremendous torque occurs at the level of the pelvis. The anterior compartment often, but not always, takes the brunt of the forces resulting from this torque. Contraction of many of the above muscles, especially the rectus abdominis, adductor longus, and psoas major, creates tremendous force and counts as a major factor in this torque. The net normal anatomic effect of this torque is a net anterior or antero-medial tilt of the pubic joint. When one muscle weakens, the result is an unequal distribution of pelvic forces compared to normal. This is basically what happens in the athletic pubalgia syndromes (Meyers,2008)

Athletic pubalgia syndrome, there is disequilibrium between the upward and oblique pull of the abdominal muscles on the pubis against the downward and lateral pull of the adductors on the inferior pubis. This imbalance of forces can lead to injuries of the lower central abdominal muscles and the upper aponeurotic common insertion of the adductor muscles. Although it is occasionally the result of an acute injury, it is more likely the result of repetitive eccentric overload to the abdominal wall stabilizers of the pelvis. It has been postulated that inadequate blood supply or simply failure to heal these repetitive attritional type injuries results in the condition (Preskitt,2011)

Sports hernia is diagnosed clinically. In general, sports hernia should be considered in patients who have a deep lower abdominal or groin pain, exacerbated with sport-specific activities and relieved with rest. Since it is a diagnosis of exclusion, other causes of pain must first be ruled out: genitourinary, intraabdominal, gynecological, hip/lumbar, or other muscular strains and spains. There may be palpable tenderness over the pubic ramus, but the most specific sign is tenderness over the medial inguinal floor, or Hesselbach’s triangle. The pain may be more severe with resisted hip adduction, but the most specific finding is pain in the inguinal floor with a resisted sit-up (Hackey 1993; Preskitt,2011)

Diagnostic imaging to identify sports hernias has not been particularly useful with the exception of ultrasonography, which enables a dynamic assessment. As the patient actively strains during the procedure a real time convex anterior bulge and ballooning of the inguinal canal can be observed at the superficial inguinal ring. Posterior inguinal wall deficiency is demonstrated when anterior abdominal wall muscle contraction reveals a loss of the normal valve-like action on the inguinal canal as the posterior inguinal wall is displaced anteriorly rather than becoming taught. (Caudill,2008)

These features however are very subtle and this test is highly operator dependent. Although this finding is also associated with a varicocele, a spermatic cord lipoma, and increasing patient age, the presence of a progressive convex anterior bulge increases the diagnostic specificity for a sports hernia. Future advancements in the use of ultrasound imaging during rehabilitation exercises and physical task performance may enable more accurate, functionally relevant assessment and evaluation of soft tissue inguinal region injuries and treatment effectiveness (Caudill,2008).

Herniography is an invasive procedure however that lacks specificity, and has a high false positive rate. Potential risks from herniography include hollow viscous perforation, vasovagal reactions, infections, abdominal wall hematomae, and contrast agent reactions. Injecting a contrast material into the abdominal or peritoneal Cavity provides an anatomical outline of the pelvic floor and its peritoneal reflections and can identify small inguinal canal tears. Herniography for the differential diagnosis of a sports hernia is rarely used in the United States (Caudill,2008).

Most sports hernias occur in males, although they may also occur in females. Harmon may have provided the most accurate sports hernia definition describing it as “the phenomena of chronic activity related groin pain that is unresponsive to conservative therapy and significantly improves with surgical repair”. Surgical success however is usually interpreted as return to sports activity timing (Caudill,2008).

Traditionally employed conservative sports hernia treatment has low success rates. Conservative treatment generally includes 6-8 weeks of rest followed by focused progressive resistance hip adductor strengthening and stretching exercises, sports specific functional tasks and gradual return to full activities. At approximately 10-12 weeks following conservative treatment initiation and when the athlete is pain-free, return to sports competition is generally attempted (Caudill,2008).

Surgical exploration and repair should only be considered when rest and non-surgical treatment over a minimum of 6-8 weeks has failed and when careful history and multidisciplinary clinical examination has ruled out other potential pain sources. When the surgical option is selected, either an open or a laparoscopic approach can provide good results. Most sports hernia surgical procedures reinforce the abdominal muscles or fascia near the inguinal ligament in a manner similar to conventional hernia surgery (Caudill,2008;Jans,2012)

Jans explains that his study group consisted of 91 amateur and 71 semi-professional or professional athletes. A significant age difference was found between the two groups, at the time of surgery, with 26.9 years (range : 16-41) in the amateur group and 24.4 years (range : 17-38) in the professional group ( $p = 0.001$ ). The mean time from the onset of symptoms to the surgical procedure was 11.1 months, without any significant difference between amateur and professional players ( $p = 0.751$ ). During that time 80% had been treated with physiotherapy and 77% had had one or more cortisone infiltrations. Only 19% of patients reported temporary improvement from conservative therapy and rest. Again no significant difference was found between the professional and amateur athletes. Eight patients already had a surgical treatment, performed elsewhere, for the same complaints (Jans,2012).

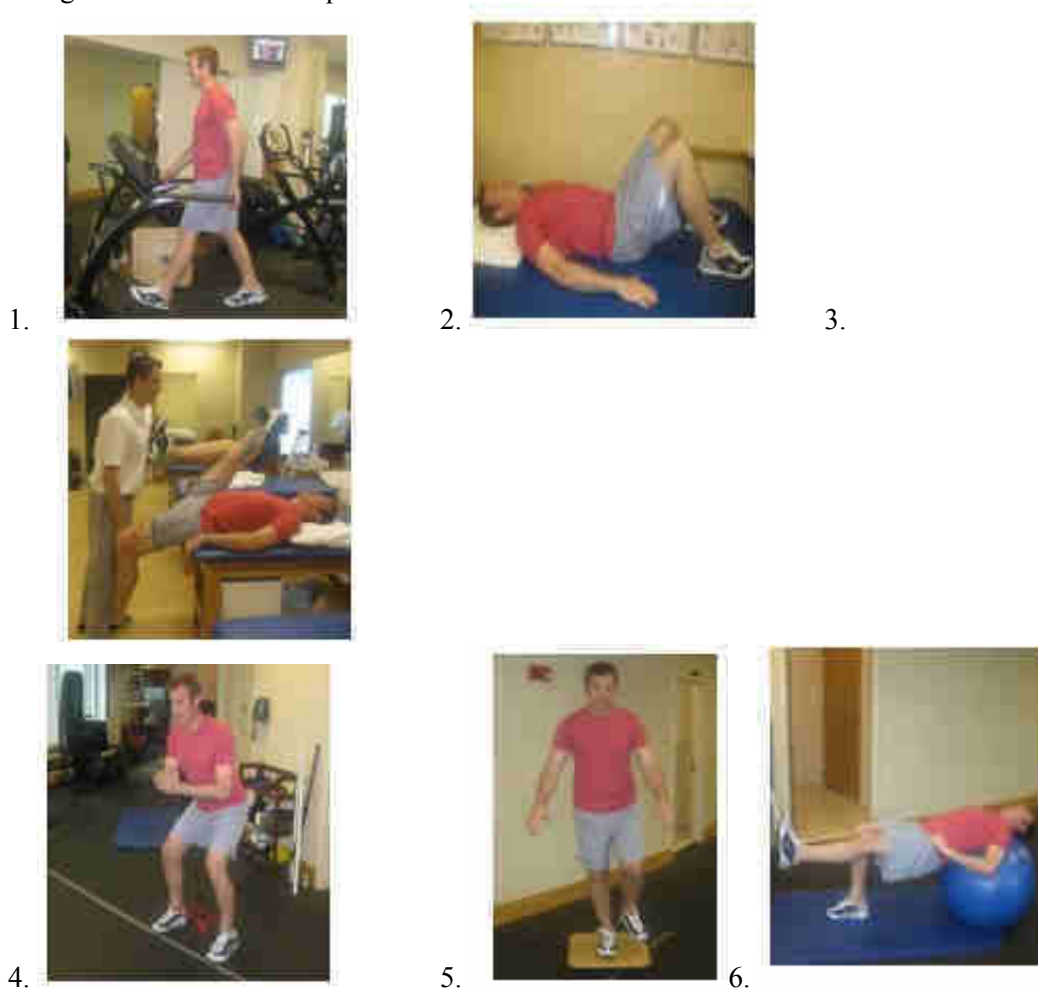
Meyers et al in performing successful open procedures on numerous athletes suggested that laparoscopic or “incorrect” open repairs that did not effectively address the causative pathology were each unlikely to have a successful outcome. Many sports hernia surgical techniques do not provide sufficient detail and several “anatomic” repairs do not incorporate the appropriate anatomic layers. A wide variety of open repair techniques are described to reinforce the inguinal canal by placating the existing tissue layers without or with mesh (Meyers,2008)

A growing number of surgeons are using laparoscopic techniques to repair sports hernias. Regardless if the surgical intervention is laparoscopic or open, success rates reportedly vary from 63-97% for both (Caudill,2008)

Following surgery, patients are asked to return to the clinic at 1 to 2 weeks and at 6 weeks. They are advised to enter into a “2-week, 2-week, 2-week” recovery program. The first 2-week period involves moderate cardiovascular conditioning for at least 30 minutes each day. At first, the activity may be walking. If patients have access to an elliptical machine, treadmill, or recumbent bicycle, these are excellent means to achieve the same goal. By the second 2-week period, most of the postoperative pain has resolved. During that period, patients are asked to continue their cardiovascular program and to increase the duration and resistance if possible (Preskitt,2011;Jans,2012)

Ryan and Jeffrey has a rehabilitation sports hernia’s program that consist of 5 phase among 15-18 weeks. Phase 1,need 1-2 weeks, the goal is tendinous tissue takes 3 weeks to

remodel, heal and become stable. During this phase of rehab physicians trainer should focus on treating the musculoskeletal systems above and below the surgical area, decrease pain and swelling and protect the surgery site. Phase II need 2-3 weeks, the goal is improve soft tissue flexibility. Re-introduce core strengthening and mild to moderate cardiovascular re-training. The third phase need 3-4 weeks, it's goal is progress all flexibility and progressive resistance exercises to involve all three planes of motion. Implement return to running. Begin to mimic sport specific activities in open kinetic chain and closed kinetic chain. Phase IV need 4-5 weeks and has the goal to initiate light sport activity with focus on hip and core stabilization. The last phase need 5-6 weeks to return to full sport activity without pain. There are some exercise that can doing on the rehabilitation phase :

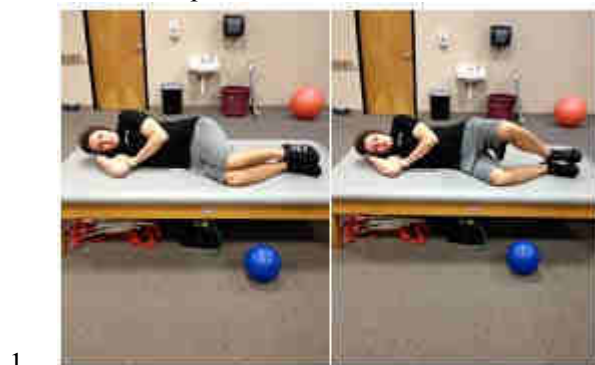




9.



The physicians trainer also can do the other exercise innovation to rehabilitation sports hernia like this picture :



(Clamshells : Hip abduction with back and ankles fixed in one position).

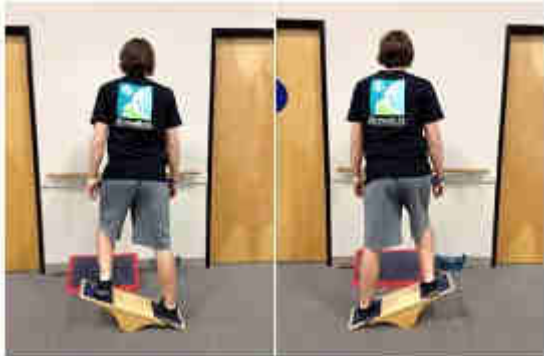


(Cowboys : Side-lying Hip internal rotation against gravity).





3. (Single leg pendulum dead lifts: single leg dead lift keeping back straight).



4. (Tilt board: Slowly control tilt board side to side while keeping hips level).



5. (Inch worms: Start in plank position and walk feet up into pike position).



6. (Russian twists : Keeping the back on physioball, rotate side to side with abdominal contraction).



7. (TRX point to pull: Full squat while pointing to the ground behind you, then pull up and reach to the top of the strap).



8. (Sport cord forward / backward shuffle: resisted forward/backward running)



9. (Ladder drills: side to side and forward hopping, skipping, bounding drills)



10. (Weighted rope drills: Single leg stance with heavy rope oscillations)



11. (Vertical Leap (volleyball/basketball specific): Max jump with controlled decelerated landing).



12. (Single leg cross body punches with 5 lb. weights: Opposite arm will cross the weight in front of stance knee, then rise up and punch across your body with other arm). (Hoadley,2010;Monagle,2009)

Sarah on her paper wrote that the sport rehabilitation program consist of lower abdomen and core exercises and proprioception exercises. The table describes a rehabilitation program that focuses on these muscles. Typical rehabilitation should include isometric holds that target the lumbopelvic hip complex musculature. Difficulty of the rehabilitation exercises can be enhanced by increasing the number of repetitions and the length of holds. The hip adductors, hip flexors, and lumbopelvic stabilizers need to work in sync to functionally control the lumbar spine, pelvis, and femur. Any imbalance, strength deficit, or lack of flexibility will affect the forces exerted across the pubic symphysis, femoral acetabular joint, lumbar spine, posterior or anterior abdominal wall, and pelvic floor (Rabe,2010).

## **Sports Rehabilitation Program**

### **LOWER ABDOMEN AND CORE EXERCISES**

Posterior pelvic tilt with complete exhalation  
Posterior pelvic tilt with complete exhalation while bridging  
Posterior pelvic tilt with complete exhalation with a crunch  
Front and side planks while maintaining pelvis neutral

### **PROPRIOCEPTION EXERCISES**

Balance on unstable surface maintaining pelvic neutral (progressing from double-leg stance to a single-leg stance)  
Balance on unstable surface while throwing and catching a ball (progressing from double-leg stance to single-leg stance)  
Balance on unstable surface with BodyBlade (Hymanson Inc, Marina Del Rey, CA) (progressing from double-leg stance to single-leg stance)

(Rabe,2010)

Organizing patient with sports hernia need a collaboration with other experienced and engaged sports health care professionals, including team trainers, physical therapists, team physicians, and sports medicine and orthopedic surgeons. The condition does not respond well to conservative measures including prolonged rest, with perhaps only 20% returning to full activity. Of the athletes who underwent surgery, 98% have returned to competition. After a minimum of 6 weeks for recovery and rehabilitation, they have usually returned to competition within 3 months.

They are also asked to begin mild to moderate strength conditioning, depending on their sport or preferred method of training. Finally, during the last 2-week period, the athletes are asked to continue to increase the cardiovascular training and the strength conditioning and to begin some sport specific activity. This is frequently running, jogging, or light sprinting. Their goal by the end of the 6 weeks is to be able to begin running, cutting, and opening up in some way appropriate to their sport (Preskitt,2011).

This 6-week period is ideally supervised by an experienced trainer or physical therapist. However, many athletes do not have access to these resources, and independent reconditioning has also been quite successful, often with frequent calls to the surgeon's office (Preskitt,2011).

## **CONCLUSION AND SUGGESTION**

The incidence of sports hernia in high performance athlete is between 0,5 and 6,7% and that sports hernia comprises 5 to 7% of sports injuries. Many patients who have chronic groin pain after hernia repair surgery have missed groin disruption injuries.

Sports hernia management to get better performance of athlete consist of surgery intervention and physiotherapy or rehabilitation program which is all of that program should be doing continuously and regularly.

## **REFERENCES**

- Caudill Paul H et al.(2008).Sports Hernia: A systemic Literature Review.*British Journal Sports Medicine* 2008.047373.<http://bjsm.bmj.com>
- Garvey John.(2011).Sports Hernia controversies and scepticism..*Aspetar sports medicine journal*.<http://www.groinpainclinic.com.au>
- Hackney R G.(1993).The Sports Hernia:a cause of chronic groin pain.*British Journal Sports Medicine* 1993,27:58-62.<http://bjsm.bmj.com>
- Hoadley Jeffrey,MD FACS et al.(2010).*Sports Hernia Repair Protocol*.[www.SportsHerniaSouth.com](http://www.SportsHerniaSouth.com)

Jans Christophe et al.(2012).*Results of surgical treatment of athletes with sportsman's hernia.* Acta Orthopædica Belgica, Vol. 78 – 1.

Meyers William C, et al.(2008).*Understanding “sports hernia”(athletic pubalgia),The anatomic and pathophysiologic basis for abdominal and groin pain in athletes.*Department of Radiology Faculty Papers;Thomas Jefferson University.<http://jdc.jefferson.edu/radiologyfp>.

Monagle Ryan.(2009).*Rehabilitation of Sports Hernia.*Personally Fit, Fitness and Physical Therapy.<http://www.sportshernia.com>

Omar, Imran M, MD et al.(2008).Athletic Pubalgia and “sports hernia”:Optimal MR Imaging Technique and Findings.*Radiographics Journals* 2008;28:1415-1438.

Preskitt John T, MD.(2011).*Sports hernia:The experience of Baylor University Medical Center at Dallas.*Baylor University Medical Center Proceeding.2011;24(2) 89-91.

Rabe Sarah B, MS, ATC, LAT; and Gretchen D. Oliver, PhD, ATC, LAT. (2010). Athletic Pubalgia: Recognition, Treatment, and Prevention;A Review of the Literature. *Athletic Training & Sports Health Care* Vol. 2 No.1.[www.atshc.com](http://www.atshc.com)

Unverzagt Casey et al.(2008).*Differential Diagnosis of a Sports Hernia in a High School Athlete.*Journal of Orthopaedic&sports physical therapy 2008,38(2).

# **A STUDY ON ACHIEVEMENT MOTIVATION BY GYMNASTICS FLOOR ATHLETE'S IN SIJUNJUNG REGENCY**

**Sri Gusti Handayani**

State University of Padang, Indonesia

## **Abstract**

Motivation is one of the factors that influence athletes' achievement, both intrinsic motivation and extrinsic motivation. This study aimed to determine the level of achievement motivation owned by the gymnastics floor athletes in Sijunjung district. This study used descriptive method. The population was all over the gymnastics floor athlete who have actively practiced until now with numbering 50 people. Samples were taken with a total sampling with a sample size of 50 people. The data were collected by using questionnaires. The data obtained were analyzed with descriptive methods. The results revealed that: motivation of gymnastics athletes in Sijunjung district based on intrinsic factors obtained an average of 3.81 with the level of achievement of 76.17%, is in a strong category. Motivation of gymnastics floor athletes in Sijunjung district based on extrinsic factors obtained an average score of 3.62 with a performance level of 72.41% and it was in a strong category. For floor gymnastics performance factor obtained an average score was 3.42 with a performance level of 68.30% and it was in a strong category. On the athlete's performance of gymnastic floor in Sijunjung district obtained an average score 4.22 with the level of achievement was 84.40% and it was in a very strong category.

**Key Words:** Motivation, Gymnastics

## **INTRODUCTION**

Nowadays have seen that athletics represent one of the element that very influence and be a needed in human life. Cause that, guidance and development of athletics can be improve the human quality, aimed at freshness of bodily, forming of character, personality and the way of thinking. Like contained in GBHN TAP NO: II/MPR/1993-1998 page 139 explaining that: "guidance and development of athletics representing the part of increase indonesian human quality it's aimed at increasing of freshness bodily, the way of thinking, and society spirit, and also adressed to forming the way of thinking and personality, dicipline and high sportivitas and also to increase achievement to awaken to feel pride of nasionalism".

Beside that, to reach fitness bodily, athletics can be improve to get achievement in each branch of athletics which guided and developed. With sciences and technology progress, the experts of athletics finding many new inventions, from athletics thoery and practice tehniqeand also shopisticated equipments that very supporting to increasing athletics achievement.

Athletics achievement is very easy word to said and yearning everyone, but it's so difficult to reach it, attainment in athletics achievement, needed good guidance, including physical guidance, technique, strategy, and the way of thinking. The constuction must be planed, step by step and continue, so that, achievement can be reach maximally. Such as contained in law republic of indonesia (UURI) No.3 . 2005, about system of nasional sportmanship section I subsection 13 explaining that: " Achievement athletics is athletics guidance and developing athletics was planed, step by step, and have continuation through competition to reach achievement with science support and sportmanship technology".

One of various athletic branch which expanded wide and fast in the centre of society in this time is floor gymnastic. Growth of this athletics can be seen from history, long time ago people do gymnastic floor just for fulfilling requirement in taking care of freshness of body to

continuity their life, but after existence of growth and progress of sophisticated technology and science, people practice gymnastic floor not just to fulfill requirement of his life, but to have target achievement in athletics.

Achievement means have excellence from other until take up athlete prestige, region and his/her nation. Floor gymnastics is one of the athletics branch that have a lot of interested person, beside that athlete floor gymnastics from sijunjung regency ever make known his/her region in achievement attainment. It can be seen that PERSANI SIJUNJUNG have a lot of floor gymnastics athlete for all age and always followed competition in each categories in group and single. But recently the coach and the official member of PERSANI SIJUNJUNG realize if there is retreating in attainment of achievement by the athlete.

According to study documentation that was done by writer to pencab PERSANI Sijunjung. There is degradation floor achievement athlete from the region from year to year, it can be seen from achievement of medal that was got from championship in region level and province always degrading, like at the ninth of Porda in Painan regency on 2002, Sijunjung regency got 3 golds medal (obtained by Yudi of floor appliance, and putra in group at parallel crossbar and also high rise crossbar), 4 silver medal (obtained by Ella Anggi Nasution at bim tool, Riza Afdillah at floor appliance, Yoga Sukma at easel jump and putri in group at floor appliance) and 4 bronze (obtained by Nova at easel appliance jump, Ella Anggi Nasution at high rise crossbar, Dian at floor appliance and Yoga Sukma at floor appliance). While in tenth Porda in Solok city, Sijunjung Regency obtained 2 golds medal (Obtained by Ella Anggi Nasution at bim appliance and Yoga Sukma high rise appliance), 3 silver medal (obtained by Riza Afdillah at floor appliance, Yogi Sukma at parallel crossbar and in group putri at bim appliance), and 3 bronze medal (obtained by Dian at floor appliance, Nova at high rise jump and in group putra at high rise jump). And as host at eleventh poprov, Sijunjung Regency obtained 2 golds medal (obtained by Yudi at floor appliance and Pujiangga at floor appliance too), 1 silver medal obtained by Yoga Sukma, and 3 bronze medal obtained by Ella Anggi Nasution at bim appliance, Riza Afdillah at floor appliance and in group putra at high rise jump (Pencab PERSANI Sijunjung 2009).

From reality above, we can see that degrading floor gymnastic at this region. Because of that, require to be done guidance totally. Degrading achievement may cause many things like, professionalism, tools and infrastructure that not complete yet, coach ability, athlete physical condition, incorrectly organizer, practice program, lack of local government attention, social economics athlete and achievement motivation. According to information from the coach and official members Pencab PERSANI Sijunjung the most dominant aspect that was be cause degrading achievement is lack of motivation from athlete to get high achievement, it's taken mark by phenomenon: athlete was lazy to do practice, there isn't target can be reach by the athlete, lose hope, no spirit for competition, no persevering, diligence, and struggle spirit in practice and competition.

Referring with phenomenon and problems that happened in Pencab PERSANI Sijunjung above the writer feel interest to have research with title : "A study on achievement motivation by Gymnastics Floor Athlete's in sijunjung regency".

## **DISCUSSION**

### **Study of Theory**

#### **Gymnastics Floor**

Gymnastic is translation of word "Gymnastic" of english language, Gymnastiek of Dutch language. While Gymnes in language of Greek-Yunani meaning is naked. This meant to gymnastic movement can be done without there is trouble so that become such perfect. floor gymnastic (exercise floor) according to K. Mahmudi Saleh, 1992 : 9 is: "Representing one clump of gymnastic matching with floor term, practice form or movements done by above the floor which have pallet of matras carpet or representing utilized by appliance area 12X12 metre and can be added by matras around area as wide as 1 metre to take care of athlete safety".

## **Achievement**

Athlete Achievement is achievement through maximal effort. Achievement is earning through practice, all these represent executed process willingly, skilled Woodworth in Soedikoen (1989:26) telling that "achievement is a person success in doing training continuously in skilled. Wiroyodo (1974:26) says that "achievement is a person competent in motoric development to get the perfect level through activity process that can directly measure by test". An athlete can get achievement with perfect achievement development. The value can be achievement level that can be reaching line with that. Ogilvie and Taylor (1993:26) telling that "achievement is maximal ability appearance with measurement by breaking the record or getting champion title.

## **Essence of Motivation**

Term motivation comes from Latin, that is *Movere* that means to move. While in English *to move* means push. From it motivation means the moving human being that aimed to specific purpose. Which told by Nawawi in Qalbi (1998 : 12 ) that: "something that push be recognized motivation". Then this opinion strengthened by Handoko in Qalbi (1998 : 12 ) tell that: "Motivation means a condition in itself that pushed to do some useful activity to reach the target". According Alderman in Gunarsa ( 1974 : 91) defined that " motivation as the wishes to have selective behaviour to the specific direction that controlled by certain consequence, that behaviour will hold out till aimed the behaviour can be reach". so, motivation can make someone to do something to get the aim.

## **Achievement of Motivation**

Achievement of Motivation firstly was faced by McClelland and friends when they intensify research about achievement needed. In their research about achievement McClelland in Qalbi (2004 : 15) tell that: "Achievement needed is human being clearly design and can be different from other needed. Someone with a large needed for his/her achievement prepared a special thing that make them work in several situation consideration other." according Paul Harsey in Zuwirda (1989:14), tell that : "achievement of motivation based on one direction behaviour to get the best achievement (Achievement oriented behavior), the behaviour aimed to the best result (*Standard of excellent*), behaviours that aimed to achievement called *Achievement motivation*".

## **Achievement Essence Motivation in Gymnastics Floor**

Motivation influence athlete achievement in Sijunjung regency. That was intrinsic motivation and extrinsic. The Gymnastics floor coach constitute important person to the success that athlete was got. Because in guidance coach an athlete get the best in competition. And at last be an athlete with optimum achievement. With that a coach have to give motivation to their athlete to have the best achievement motivation. A coach must be understood the character of his/her athlete. The requirement is absolute, because the coach known his/her athlete ability deeply. Nowadays The gymnastics coach it's not enough to prepare himself with technique ability training, but must capable in psychology as provisions to close his/her athlete in take care his/her way of thinking condition. Most of the coach called success and excellent motivator. but, But, these days role of coach which too big sometimes no longer can wrap everything that happened. At that Moment required an " assistant" coach as specifically growth of his emotion. Usually this " assistant" is a motivator or is broader of him a same laboring athletic psychologist fully with coach of head. In general, injection motivate or player of athlete still in form of oral or said, like praise words or a kind of. But, keeping abreast of training method these days, motivation injection can be realized in course of technical practice which passed by.



## METHODOLOGIES RESEARCH

### Type, Place and Time Research

This Research including descriptive research that is research with aim to make and describe data systematically to nature of certain population, as well as depicting situation of research object, pursuant to existing facts. such as told by Suwirman ( 2004 : 45) explaining that " Descriptive research aim to make reclination systematically, faktual, and accurate regarding facts and nature of certain population. In this case researcher of describing concerning certain events and situations". this Research placedone by gymnastic club dance Sub-Province of Sijunjung, in june - August 2009.

### Population and Sampel

As according to accurate object, this research take population entire/all active floor gymnastic atlet exercise in Club exist in Sub-Province of Sijunjung. Pursuant to obtained information, of coach of gymnastic dance in Sub-Province of Sijunjung, grand total of atlet active floor gymnastic exercise hither to amount to 50 people of atlet. To get sampel which is representative, writer of orientation to opinion of Arikunto ( 2002:112), that: " If its less than 100, better taken by all. Hereinafter if its amount of big him and more than 100 can be taken among 10 - 15 % or 20 - 25 %. Hence Technique intake of sampel that is with total technique of its meaning sampling all population made by sampel". Become this research sampel amount to 50 people.

### Result of Research

As according to needed data type, that is primary type data and of sekunder, hence is descriptive of data conducted by propagating enquette, execution of observation in the form of direct perception in interview and field with responder. This matter good for seeing nearer again, so that complete obtained data progressively. Tread on a former description, hence further to analyse data and solution of compilation of skripsi using method of deskriptif, data which have been processed is mentioned, can be interpreted so that represent answer of question of researcher laying open as it is about study about achievement of atlet gymnastic dance Sub-Province of Sijunjung. Following can be showed by data result of research pursuant to existing indicators.

### Intrinsic Factor

To get data about motivation of achievement gymnastic atlet dance in Sub-Province of Sijunjung pursuant to intrinsic factor, at this research writer gave quistionere research enquette by 8 indicator. To be more sharpness earn in seeing at following:tables 4.1

**Table 1**  
**Distribution Answer Responder About Factor Achievement**  
**Pursuant to Intrinsic Factor**  
**in Sub-Province of Sijunjung**

No	Sub Variabel / Indikator	Item	Kriteria Pernyataan										Rata-Rata Skor	TC (%)	Ket
			SS		S		N		TS		STS				
			F	%	F	%	F	%	F	%	F	%			
1	Semangat juang	5	87	34.80	950	38.00	410	16.40	240	9.60	3120	1.20	3.96	79.12	Kuat
2	Disiplin	5	940	37.60	1080	43.20	290	11.60	170	6.80	2080	0.80	4.10	82.00	Sangat Kuat
3	Tidak Tergantung Pada Orang Lain	3	383	25.33	480	32.00	503	33.33	120	8.00	2133	1.33	3.72	74.40	Kuat
4	Memiliki	4	35	17.5	80	40.0	55	27.5	25	12.5	5250	2.50	3.5	71.50	Kuat

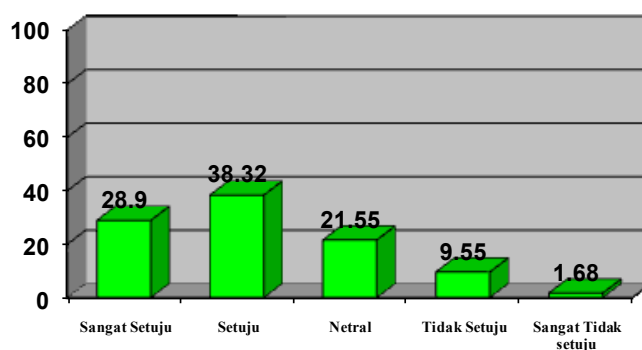
	Kepribadian			0		0		0		0			8		
5	Jujur	3	33	22.0	61	40.6	41	27.3	14	9.33	1	0.67	3.7	74.80	Kuat
				0		7		3					4		
6	Sportif	3	29	19.3	68	45.3	32	21.3	17	11.3	4	2.67	3.6	73.47	Kuat
				3		3		3		3			7		
7	Percaya diri	4	50	25.0	73	36.5	51	25.5	19	9.50	7	3.50	3.7	74.00	Kuat
				0		0		0					0		
8	Harapan Hadiah	4	82	41.0	61	30.5	35	17.5	20	10.0	2	1.00	4.0	80.10	Kuat
				0		0		0		0			1		
Rata-Rata Total		31	448	28.9	594	38.3	334	21.5	14	9.55	26	1.68	3.8	76.17	Kuat
				0		2		5	8				1		

Source : Data-Processing of Primary ( 2009)

From tables above can be seen that for obtained intrinsic factor mean equal to 3,81 with performance storey;level equal to 76,17%. Its meaning motivation of atlet gymnastic dance in Sub-Province of Sijunjung pursuant to intrinsic factor stay in strong category. If/When seen from statement answered by responder for criterion very agree ( SS) equal to 28,90%, criterion agree ( S) equal to 38,32%, neutral criterion ( N) equal to 21,55%, criterion disagree ( TS) equal to 9,55% and dross criterion disagree ( STS) equal to 1,68%.

For statement at sub of variable struggle of pirit have performance storey;level equal to 79,12% and stay in strong category. For the sub of discipline variable obtained by performance storey;level equal to 82,00% and stay in category very strong. For the sub of variable [do] not depend on others obtained [by] performance storey;level equal to 74,40% and stay in strong category. For the sub of variable have personality obtained [by] performance storey;level equal to 71,50% and stay in strong category. obtained by downright Variable sub of performance storey;level equal to 74,80% and stay in strong category. For the sub of obtained by sportsmanlike variable of performance storey;level equal to 73,47% and stay in strong category. For the sub of self confidence variable obtained by performance storey;level equal to 74,00% and stay in strong category. And for the sub of present expectation variable obtained by performance storey;level equal to 80,10% and stay in strong category. Pursuant to result of research concerning achievement factor of atlet gymnastic dance Sub-Province of Sijunjung hence earning us know that which need to become attention to gymnastic atlet dance is personality indicator owning tired storey;level equal to 71,50% lowering to be compared to the other indicator.

clearly picture deskripsi motivate gymnastic atlet intrinsic dance in Sub-Province of Sijunjung can be seen by at histogram graph following:



**Figure 1**  
**Intrinsic Factor Motivation in attainment of Achievement of atlet floor gymnastic in Sub-Province of Sijunjung**

### Factor of Ekstrinsik

To get data about motivation of atlet gymnastic dance in Sub-Province of Sijunjung pursuant to factor of ekstrinsik, at this research of writer allot research enquette by 5 indicator sub. To be more sharpness earn in seeing at following tables 4.2:

**Table 2**  
**Distribution Answer Responder About Factor Achievement**  
**Pursuant to Factor of Ektrinsik**  
**in Sub-Province of Sijunjung**

N o	Sub Variabel/ Indikator	Item	Kriteria Pernyataan										Rata- Rata Skor	TC (% )	Ket
			SS		S		N		TS		STS				
			F	%	F	%	F	%	F	%	F	%			
1	Motivasi dari Pelatih	2	15	15.00	37	37.00	31	31.00	15	15.00	2	2.00	3.48	69.60	Kuat
2	Dukungan Teman	2	9	9.00	40	40.00	34	34.00	13	13.00	4	4.00	3.37	67.40	Kuat
3	Perlengkap an Sarana dan Prasarana	3	29	19.33	35	23.33	56	37.33	20	13.33	10	6.67	3.35	67.07	Kuat
4	Peranan Pelatih	6	112	37.33	119	39.67	51	17.00	17	5.67	1	0.33	4.08	81.60	Sang at Kuat
5	Kebutuhan Penghargaan	1	13	26.00	18	36.00	16	32.00	3	6.00	0	0.00	3.82	76.40	Kuat
Rata-Rata Total		14	178	25.43	249	35.57	188	26.86	68	9.71	17	2.43	3.62	72.41	Kuat

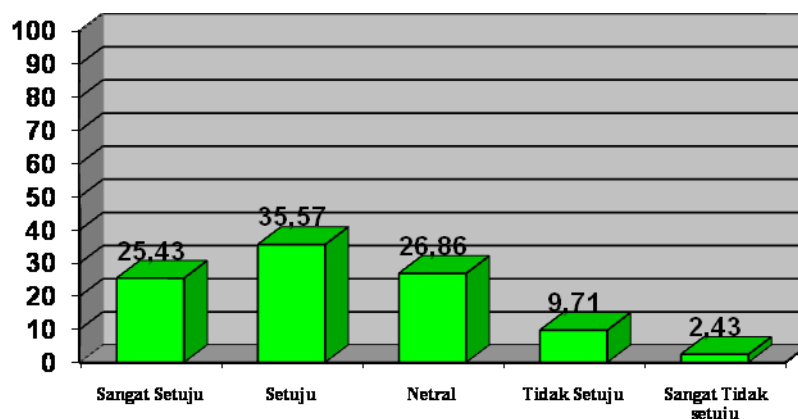
Source : Data-Processing of Primary ( 2009)

Pursuant to tables above can be seen that for the motivation of gymnastic atlet dance in Sub-Province of Sijunjung pursuant to factor of ekstrinsik obtained by score mean 3,62 with performance storey;level equal to 72,41% and stay in strong category. If seen from statement criterion answered by responder for criterion very agree ( SS) equal to 25,43%, criterion agree ( S) equal to 35,57%, neutral criterion ( N) equal to 26,86%, criterion disagree ( TS) equal to 9,71% and dross criterion disagree ( STS) equal to 2,43%.

If seen from each indicator hence for indicator motivate from coach obtained by score mean equal to 3,48 with performance storey;level equal to 69,60% and stay in strong category. For the indicator of friend support obtained by score mean 3,37 with performance storey;level 67,40% and stay in strong category. For the indicator of supply of facilities and basic facilities obtained by mean score 3,35 with performance storey;level equal to 67,07% and stay in strong category. For the indicator of role of coach obtained [by] score mean equal to 4,08 with performance storey;level equal to 81,60% and stay in category very strong. For the indicator of requirement of appreciation obtained by score mean equal to 3,82 with performance storey;level equal to 76,40% and stay in strong category

Pursuant to result of research concerning achievement factor of facet of ekstrinsik gymnastic atlet dance Sub-Province of Sijunjung hence earning us know that which need to become attention to gymnastic atlet dance is indicator supply of facilities and basic facilities owning tired storey;level equal to 67,07% lowering to be compared to the other indicator.

Clearly picture description of motivate Ekstrinsik gymnastic atlet dance in Sub-Province of Sijunjung can be seen at following histogram graph:



**Figure 2**  
**Factor Motivate Ekstrinsik in attainment of Achievement of atlet floor gymnastic in Sub-Province of Sijunjung**

#### Practice gymnastic Floor

To get data about Atlet at Football school (SSB) Sub-Province of Sijunjung, at this research of writer allot research enquette by 2 indicator. To be more sharpness earn in seeing at following tables 4.3

**Table 3**  
**Distribution Answer Responder About Factor Achievement Gymnastic Dance in Sub-Province of Sijunjung**

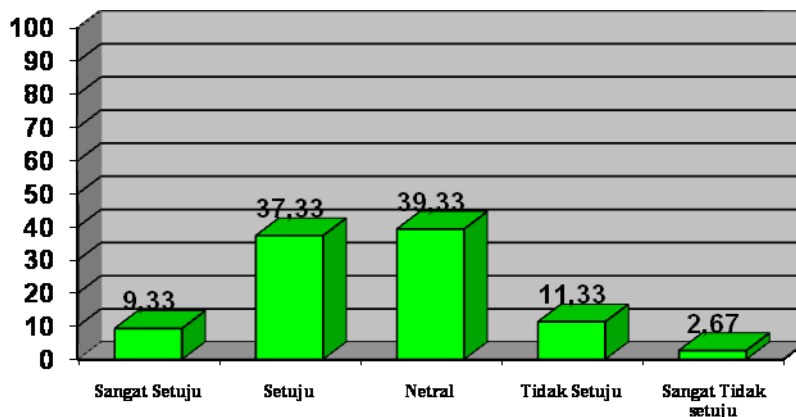
No	Sub Variabel / Indikator	Item	Kriteria Pernyataan										Rata-Rata Skor	TC (%)	Ket
			SS		S		N		TS		STS				
			F	%	F	%	F	%	F	%	F	%			
1	Senam Umum	2	11	11.00	31	31.00	42	42.00	14	14.00	2	2.00	3.35	67.00	Kuat
2	Senam Lantai	1	3	6.00	25	50.00	17	34.00	3	6.00	2	4.00	3.48	69.60	Kuat
Rata-Rata Total		1	14	9.33	56	37.33	59	39.33	17	11.33	4	2.67	3.42	68.30	Kuat

Source : Data-Processing of Primary ( 2009

Pursuant to tables above can be seen that for the factor of floor gymnastic achievement obtained by score mean is 3,42 with performance storey;level equal to 68,30% and stay in strong category. If seen from statement criterion answered by responder for criterion very agree (SS) equal to 9,33%, criterion agree ( S ) equal to 37,33%, neutral criterion ( N) equal to 39,33%, criterion disagree ( TS) equal to 11,33% and dross criterion disagree (STS) equal to 2,67.

If seen from each indicator hence for the indicator of common gymnastic of atlet obtained by score mean equal to 3,35 with performance storey;level equal to 67,00% and stay in strong category. For the indicator of floor gymnastic obtained by score mean 3,48 with performance storey;level 69,60% and stay in strong category

Pursuant to result of research concerning achievement factor of atlet gymnastic dance Sub-Province of Sijunjung hence earning us know that which need to become attention to gymnastic atlet dance is common gymnastic which have tired storey;level of terendah that is equal to 67,00% lowering to be compared to the other indicator clearly picture atlet deskripsi about gymnastic dance in Sub-Province of Sijunjung can be seen at following histogram graph:



**Graph 3**  
**Factor Gymnastic dance to atlet in attainment of Achievement floor gymnastic in Sub-Province of Sijunjung**

#### Achievement

To get data about achievement of Altet gymnastic dance Sub-Province of Sijunjung, this research of writer allot research enquette by 2 indicator. To be more sharpness earn in seeing at following:tables 4.4

**Tables 4.4**  
**Distribution Answer Responder About Achievement Atlet Gymnastic Dance in Sub-Province of Sijunjung**

No	Sub Variabel/ Indikator	Item	Kriteria Pernyataan										Rata-Rata Skor	TC (%)	Ket
			SS		S		N		TS		STS				
			F	%	F	%	F	%	F	%	F	%			
1	Prestasi Maksimal	2	180	36.00	210	42.00	100	20.00	100	2.00	000	0.00	4.12	82.40	Sangat Kuat
2	Prestasi Senam Lantai	1	230	46.00	220	44.00	400	8.00	000	0.00	100	2.00	4.32	86.40	Sangat Kuat
Rata-Rata Total		1	410	41.00	430	43.00	140	14.00	100	1.00	100	1.00	4.22	84.40	Sangat Kuat

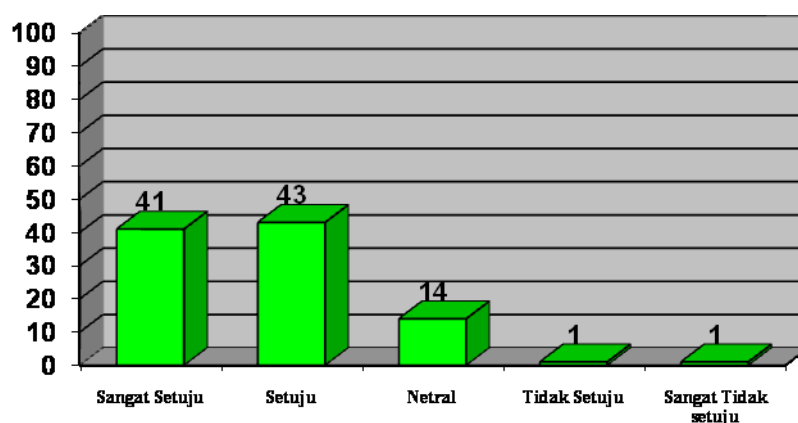
Source : Data-Processing of Primary ( 2009 )

Pursuant to tables above can be seen that about achievement of atlet gymnastic dance in Sub-Province of Sijunjung obtained by score mean 4,22 with performance storey;level equal to 84,40% and stay in category very strong. If seen from statement criterion answered by responder for criterion very agree ( SS) equal to 41,00%, criterion agree ( S) equal to 43,00%, neutral criterion ( N) equal to 14,00%, criterion disagree ( TS) equal to 1,00% and dross criterion disagree ( STS) equal to 1,00%.

If seen from each indicator hence for the indicator of obtained maximal achievement of score mean equal to 4,12 with performance storey;level equal to 82,40% and stay in category very strong. For the indicator of floor gymnastic achievement obtained score mean 4,32 with performance storey;level 86,40% and stay in category very strong

Pursuant to result of research concerning achievement of atlet gymnastic dance Sub-Province of Sijunjung hence earning us know that which need to become attention to gymnastic atlet dance is maximal achievement which have tired storey;level of terendah that is equal to 82,40% lowering to be compared to the other indicator.

**clearly Achievement deskripsi of atlet gymnastic dance in Sub-Province of Sijunjung can be seen at following histogram graph:**



**Graph 4**  
**Factor Achievement in attainment of Achievement of atlet floor gymnastic in Sub-Province of Sijunjung**

## CONCLUSION AND SUGGESTION

### Conclusion

After research about Achievement Motivation to atlet gymnastic dance in Sub-Province of Sijunjung hence by the end of this solution can be taken conclusion that is as follows :

1. For obtained by intrinsic factor mean equal to 3,81 with performance storey;level equal to 76,17%. Its meaning of motivation of atlet gymnastic dance in Sub-Province of Sijunjung pursuant to intrinsic factor stay in strong category
2. For the motivation of gymnastic atlet dance in Sub-Province of Sijunjung pursuant to factor of ekstrinsik obtained by score mean 3,62 with performance storey;level equal to 72,41% and stay in strong category
3. For the factor of floor gymnastic achievement obtained b] score mean 3,42 with performance storey;level equal to 68,30% and stay in strong category
4. About achievement of atlet gymnastic dance in Sub-Province of Sijunjung obtained score mean 4,22 with performance storey;level equal to 84,40% and stay in category very strong.

### Suggestions

Starting to former descriptions and also conclusions above, hence told by suggestion which possible there its benefit to official member, and coach of atlet-atlet gymnastic dance in Sub-Province of Sijunjung. the Suggestions are:

1. Expected to official member can look for sponsors able to give motivation to and coach of atlet which is have achievement with giving of incentive
2. Expected to coach to be earning more emphasizing to atlet-atlet to programs which have been made to be can be executed as well as possible
3. Expected to atlet-atlet can take care and also look after medium of prasarana which have there and expected also to all official member to be able to equip facilities and basic facilities for practice
4. Expected to gymnastic atlet dance Sub-Province of Sijunjung to be able to improve practice frequency so that expected achievement can reach.

## REFERENCE

- Alderman. 1974. *Dasar-dasar Psikologi*. Jakarta : Pustaka Sinar Harapan, Anggota Ikapi.
- Abraham, H, Maslow .1993. *Motivasi dan Kepribadian Remaja*. Bandung : Rosdakarya.
- Ambra, Qalbi. 2004. *Kontribusi Motivasi Berprestasi dan Persepsi tentang Kemampuan Profesional Pelatih terhadap Prestasi atlet Sumatera Barat (tesis)*. Padang : PPS UNP.
- Anoraga, Subiyanto. 1992. *Psikologi Kerja*. Jakarta: Rineka Cipta.
- Asa'ad. 2005. *Kontribusi Motivasi Berprestasi dan Budaya Kerja Terhadap Kinerja Guru Madrasah Aliyah Negeri (MAN) di Kota Padang (Tesis)*. Padang : PPS UNP.
- Nawawi. 1998. *Manajemen Sumber Daya Manusia*. Yogyakarta : UGM.
- Ogillie, Taylor. 1993. *Preceesings of the fifth world congress of sport phychology*. Ottawa: Canada.
- Riduwan. 2003. *Skala Pengukuran Variabel- Variabel Penelitian*. Bandung : Alfa Beta.
- Setyobroto, Sudibyo. 2002. *Mental Training*. Jakarta : Percetakan Solo.
- Setyobroto, Sudibyo. 2005. *Psikologi Olahraga*. Jakarta : Percetakan Universitas Negeri Jakarta.
- Sholeh, Mahmudi. 1992. *Olahraga Pilihan Senam*. Surakarta : Departemen Pendidikan dan Kebudayaan, Direktorat Jenderal Pendidikan Tinggi, Proyek Pembinaan Tenaga Kependidikan.
- Singer, H, Robert. 1980. *Motor Learning and human performance, An Application To Motor Skill and Movement Behavior*. New york : Mac Millen Publishing, Co, Inc.
- Singgih, Gunarsa, dkk. 1989. *Psikologi olahraga*. Jakarta : BPK Gunung Mulia.
- Soedikoen, Imam. 1898. *Pengaruh Beberapa Faktor Terhadap Hasil Belajar Keterampilan Bola Basket Tingkat Dasar*. Disertasi. Jakarta
- Syahrastani. 1999. *Psikologi Olahraga*. Padang : FIK UNP.
- Weiberg. 1995. *Dasar-dasar psikologi Olahraga*. Jakarta : Pustaka Sinar Harapan.
- Winkel W.S. 1987. *Psikologi Pendidikan dan Evaluasi Belajar*. Jakarta : PT. Gramedia.

Woridoyo, Subiyanto. 1974. *Teknik Evaluasi Hasil Belajar*. Yogyakarta : Yayasan Pancasila.

Zuwirda. 1989. *Motivasi Berprestasi dan Hubungan dengan Hasil Belajar Siswa SMA Negeri Kayu Tanam dan SMA Negeri Sicincin (tesis)*. Padang : PPS UNP.

Undang-Undang Olahraga No. III Tahun 2005



# **EFFECT OF STRESS AND ANXIETY SWIMMING PERFORMANCE ATHLETES**

**Sungkowo**

**Semarang State University, Indonesia  
sungkowo80@yahoo.co.id**

## **Abstract**

Swimmer facing a race, it is only natural that athletes be stress , tense , indecisive , fearful , anxious , especially when facing a stronger opponent or balanced , and if the situation is tense . Stress is on going can cause anxiety , because the level of tension that can stress should be monitored continuously , tailored to the athlete's ability to face stress atmosphere . In addition, the level of severity. Emotion or feeling swimmer needs special attention in the sport , because emotions affect athletes in addition to another psychiatric aspects , affecting aspects fisiologik so obviously will affect the increase or decline in the athlete's performance . In an effort to control anxiety ( anxiety ) and stress in sport , including : 1.Strategi Relaxation , 2. Cognitive strategies, 3.teknik tension - easing techniques, 4 . defense mechanism.

**Key words** : Stress , Anxiety , performance swimmer

## **INTRODUCTION**

Since approximately half a century ago the existence of a reciprocal relationship between mind and body , or between physical and psychological symptoms , has been the subject of discussion psychologists . Ronge (1951 ) mentions the human as an organism , which follows the laws of biology , the laws of thought , sense of justice , and so on . Feeling or emotion plays an important role in human life . All emotional symptoms such as fear, anger , anxiety , stress , full of hope , joy , etc. , can affect changes a person's physical condition . Feelings or emotions can give physiological effects such as muscle tension , heart rate , circulatory , respiratory , hormonal functioning of certain glands .

With respect it is clear that all the psychological symptoms will affect the performance and achievements of athletes . In this connection the influence of emotional disturbances need to be considered , because it can affect the emotional disturbance " psychological stability " or psychic balance as a whole , and this led to great achievements pencapaian athletes . In sports activities , especially to be able to reach high achievement , required functioning of certain psychological aspects , for example to achieve a high achievement in sports pool , the athlete must be able to focus properly , confident, calm , can concentrate despite the noise of the audience or the other athletes , etc. her . This all will be , disrupted if the athlete in question suffered emotional disturbance . Emotion or feeling swimmer needs special attention in the sport , as athletes in addition to the emotional aspects affect other mental health ( mind and the will ) , also affects aspects fisiologiknya so obviously will affect the increase or decline in the athlete's performance . Judging from the concept of the unity of body and soul that is organic , the emotional disturbance of self swimmer will affect the psychological state of the athlete as a whole , emotional instability or " emotional instability " will result in psychological instability " , and will affect the role of the function - psychological functioning , and ultimately affect the achievement of athletes .

## **ISSUES**

In the above problems speakers emphasize a few problems such as:

What is the definition of Anxiety ( anxiety ) in the sport ?

What is the definition of stress in sport ?

How to control efforts ?

## **OBJECTIVES**

Authors preparing this paper with the aim of :

Knowing how big the influence of anxiety , stress and control efforts in the face of a swimmer swimming race .

Strive for basic tasks and roles a coach to be able to build confidence with both an athlete that ultimately the main goal can be achieved sporting achievements .

## **BENEFITS**

The benefits to be achieved in the writing of this paper is in order for the coaches , teachers and people who wrestle in it through an understanding of the function and role assignment can improve the ability to educate or teach to their students able to develop the potential of self-learners , develop creativity and encourage scientific discoveries and innovative technologies , so that the swimmer can compete on an international level adjacent achievements .

### **Anxiety ( Anxiety ) in Sports**

Anxiety ( Anxiety ) is one of the psychological symptoms are identical to the negative feelings . Some psychologists explain the sense of anxiety in a variety of meanings . According to Robert S. Weinberg and Daniel Gold (2007 : 78 ) defines anxiety is a negative feeling that has traits nervousness , anxiety , fear that something will happen , and is happening in the body movement or excitement . Anxiety has two components, namely consisting of cognitive anxiety (cognitive anxiety ) that is characterized by anxiety and fear that something will happen , while the second is a somatic anxiety ( somatic anxiety ) are characterized by the size of the physical state of a person.

While Pahlavi (1991 ) defines anxiety as a tendency to perceive the situation as a threat and will affect behavior . Handoyo (1980 ) describes anxiety as an emotional state experienced by a person , where he felt tense without real causes and circumstances of this unpleasant effect and result in a change - a change in the body both somatic and psychological of the various opinions of the experts concluded that anxiety is something that will be done and has not happened characterized by anxiety, lack of confidence , anxiety which can sometimes interfere with the body's physiological performance . Anxiety is a common psychological symptoms and each person must have experienced consciously athletes in the face of the game or race , it is only natural that athletes be stress , tense , indecisive , fearful , anxious , especially when facing a stronger opponent or balanced , and if the situation is tense . Fear of athletes in general can be classified into several categories ( Cratty , 1973) :

a. Fear of failure in the match b . The fear of the social consequences for the quality of their achievement c . Afraid that injury or harm opponents d . Fear not physically be able to complete the task or game with baiko . ( And believe it or not ) , there are athletes who are afraid of winning .

From the results of the study showed that most athletes tend to be afraid of the social consequences that they will get over the quality of their achievements . For example, fear of failing to meet expectations of coaches , KONI , government , fear of ridicule , criticism , denounced the public .

### **1 . Anxiety and Achievement Motive**

Atmosphere stress often make one's life full of passion , full of atmosphere as it can cope with stress can lead to satisfaction and pride in one's self . Which is more important in coaching athletes , which increases the ability to cope with stress will also keep the possibility of athletes experiencing intelligence . Stress is ongoing can cause anxiety , because the level of tension that can cause stress should be monitored continuously , tailored to the athlete's ability to face stress atmosphere . In addition, the level of severity . Voltage that can be borne by the athletes , especially youth athletes , should always be considered because of stress or psychological tension that is too large , which is not bearable by athletes , can also cause anxiety.

Crafty ( 1973) differentiates the likelihood of anxiety for fear of injury or " harm anxiety " or fear of failure or fear of "failure anxiety " . In this connection, Crotty argues as follows:" Thus , failure anxiety is related to . The individual 's perception of the Social Consequences of his relative success or failure in a situation : This type of fear was more important to most of the individuals polled than was harm- anxiety, or the fear of being physically incapacitated. Penelitian more about anxiety because of fear of injury and anxiety because of fear of failure , recognized by Crotty has not been developed further . regarding anxiety because of fear of failure in one hand and hope for success on the other hand is interesting enough to be used as study material . Relative this Crotty argues as follows :

" The degree to anxiety levels in the which interfere with an individual 's performance , therefore , is probably related to the individual 's feelings about success vs . Failure and his overall need for achievement . "

During the Olympic Games 1968 by sports psychologists have conducted research on the relationship between anxiety , achievement motive , with the appearance of the athletes . Athletes as test subjects were divided into four groups , namely who have high anxiety or "high anxiety " and who have low anxiety or "low anxiety " ; then each group is subdivided on the basis of ( criteria ) those with high achievement motive or "high needs for achievement and who have low achievement motive or " low needs for achievement

## **2 . Anxiety and prustasi**

Between the stress , " arousal " , and anxiety or "anxiety " , according to Richard H. Cox is no association . Anxiety can be defined as a subjective feeling of fear and increasing based on " physiological arousal " ( Levitt , 1980) . Regarding the relationship of stress with anxiety , Soparinch and Sumorno , kum (1982 ) argues as follows :

" When the stress experienced by someone too big for him , so no action can be done to overcome him, and if the stress faced one continuous , then there will be anxiety . Anxiety is a feeling of helplessness , insecurity , for no apparent reason . feelings of anxiety or anxiety when viewed from the word "anxiety " means a feeling of choking " .

Feelings of anxiety can occur in athletes when facing certain circumstances , for example in the face of a swimming race that takes a long time and it turns out the athlete suffered continual defeat . Anxiety that occurs in a particular state is called " State Anxiety " . According to Spielberger ( 1985 ) " state anxiety " is an emotional state that occurs suddenly ( at certain times ) is characterized by anxiety , fear , and tension ; usually followed by a deep feeling of anxiety accompanied by tension and " physiological arousal " .

In addition to the " state anxiety " also known as "trait anxiety " , that anxiety is an individual's personal traits . Trait anxiety is a more settled personal nature ( such as character traits ) . Athletes who memil.ikj "trait anxiety " usually shows properties anxious face various problems , particularly related pemasalahan personal security or " emotional security " of his . Feelings of anxiety in essence occurs because the individual concerned will be disrupted personal security "of his , therefore the individual concerned to show symptoms of anxiety, which contain fear . " State Anxiety " is a specific symptom of how the individual circumstances facing certain situations that interfere with " personal security " her ; " state anxiety " has references objective (objective reference ) . " trait anxiety " as an individual's personal characteristics are more permanent and will appear at various events or situations in which the individual concerned was subject to " personal security " it ; "trait anxiety " has a subjective referral ( wiki reference ) .

In connection with the symptoms of "trait anxiety " is, Silva and Weinberg (1984 ) ' recognize the symptoms of " competitive trait anxiety " ( CTA ) on the temporary athlete . The CTA symptoms gejala di pdalah where athletes showed anxiety and fear just in time ' will face competition , and after the completion of competition athletes showed no anxiety or become normal again Sonstroem Robert J. (1984 ) in a paper entitled : " An Overview of anxiety in Sport " compiled by Silva and Weiberg in " Psychological Foundations of Sport " , suggests research and Schewartz Davidson (1976 ) who uses postulates ( basic assumption ) that the

perception of anxiety can be distinguished on the cognitive and somatic components . With a questionnaire developed traits experience anxiety , and grouping on the basis of these characteristics are used to define the system , the recommended treatment Borkovec (1976 ) as follows:

" That is , cognitive anxiety reduction is more compatible with the self - instruction and thought - stopping methods , for example , and somatic anxiety reduction is better accomplished with methods such as progressive relaxation , biofeedback  $\rightarrow$  back , and Qxercise . " Davidson and the findings Schwartz , a finding which is very useful to be applied in preparing the athlete mentally coaching program , with respect to individual differences in athletes who show symptoms of anxiety .

### **B. Stress In Sport ( Emotional symptoms )**

Just as our muscles strained as physical exercise then we too can experience psychological tension , the so-called " stress " . According Gauron (1984 ) stress such as muscle tension is inevitable in everyday human life . We can not avoid psychological tension or stress , some tension is needed and some tension is not required in appearance and perform tasks . According Gauron lack of tension or "lack of tension " will result we can not do something well . To be able to perform certain movements needed muscle tension , where tension is indispensable usefulness .

Every athlete competing in a sporting event felt an increase in emotional tension in anticipation of the game situation at hand. Singer (1986 ) suggested that the activity of tension is not always bad for an athlete . Judging from the kinds of mental and emotional reactions , Singer shows dues symptoms associated with emotions , namely : the absence of full readiness and preparedness . The lack of preparedness or " readiness under " no relations with a lack of motivation , while the " over- readiness " full readiness or preparedness for dealing with a win or a bad appearance , fear of losing, and so her .

Stress or tension can form a wide range of psychic . According Gauron (1984 ) showed symptoms of stress are not equal to the challenges faced thing , to be able to do the adaptation . Deal with stress , the human body Conducting the reaction in a manner or form that is consistent , there is a deployment or " arousal " autonomous system requirements " according Gauron tertentu. Jadi stress symptoms can be more varied than the " tension " or physical strain experienced by a person .

### **1 ) Stress and Events**

According to Scanlan (1984 ) in his article titled : " Competitive Stress and the Child Athlete " which was published in the book " Psychological Foundations of Sport " argues that " competitive stress " or stress arising in the game is a negative emotional reaction to the child if the sense of - he felt threatened . Things like this happen when the junior athletes regard the match as a serious challenge to be successful , given the ability of his performance , and in such circumstances the athlete more concerned with the result of his defeat . Stress is always going to happen to individuals when something is expected to be challenged , so the possibility of not reaching the expectations haunt his thoughts . Stress is an emotional strain , the end of his  $\rightarrow$  influence the processes of psychological and physiological processes .

Spielberger (1986 ) writing on " Stress and Anxiety in Sports " in a collection of scientific papers compiled by Morgan titled " Sport Psychology " (1986 ) asserts that the stress shows " psychobiological process" complex , a process which means that the situation can be detrimental . dangerous , or can lead to frustration ( stressor ) . " Stressors " according to Spielberger (1986 ) suggests situations or stimuli that are objectively characterized by physical or psychological pressure or danger to a certain degree . stressful situations to be found in everyday life , in different stages of human development .

Different reactions will appear in the face of " stressor " , depending on the particular situation that is estimated to contain the threat . The threat is also related to the perception and individual assessment of the situation at hand as it can harm and hazards . In conjunction with sports activities , in particular the possibility of stress for the game , then the problem is very

much dependent on the athletes concerned . Regarding the onset of stress , Gauron (1984 ) concluded: " Because stress is an Inevitable part of life , it can not be avoided . Since stress is inevitable , individuals must reduce its effects and cope through a personal stress management program.

Chronic stress may have adverse effects upon the body particularly if it is not taught to relax ". It may well be a similar situation can be perceived as a threat to an athlete , but only a challenge for the other athletes , and perhaps not even mean anything for other athletes . So from the experiences of threats , nothing to do with the mental state of the athlete in question . Regarding the threat in relation to the mental state of the athlete , Spielberger (1986 ) mengemukakan'adanya two basic characteristics , which concludes as follows : ' Thus , the experience of threat is , Essentially , a state of mind roomates mein has two characteristics : It is future - oriented , Generally involving the anticipation of a Potentially Harmful event that has not yet happened ; and it is mediated by mental activities- peerception , thought , memory , and judgment roomates are INVOLVED in the appraisal process ".

Assessment of the threat faced by the assessment yang danger faced ( future ) contribute importantly to the emotional reactions and actions to be taken to avoid the threat or danger of individual faces.

## 2 . Arousal " and " Inverted U "

Arousal " is inevitable as the onset of physical tension or " tension " and stress . What is meant by " arousal " is a symptom that indicates an increased mobilization of psychic activity . Occurrence of symptoms of " arousal " usually runs parallel with the increase in performance athletes ; with in other words there is a positive correlation between " arousal " with the performance of athletes . According to Cox (1985 ) " arousal " is a neutral term that indicates an increase in sympathetic nervous system activity . This shows an increase in intensity , and can not be used to indicate a particular emotional state . example , both in the excited state or in a state of fear , both can lead to the " arousal " physiological ; despite the fear is gejala , negative affect , while happy or excited is that the effects are positive symptoms .

C. Efforts to control them to anxiety and stress in sport

In an effort to control anxiety ( anxiety ) and stress in sport , including : 1.Strategi Relaxation, 2. Cognitive strategies, 3.teknik tension - easing techniques and 4 . defense mechanism ,

### 1 . Relaxation strategies

Relaxed state is the current state of an athlete to be in a calm emotional state , that is not turbulent or tense . Turbulent state does not mean merendahnya passion to play , but can be regulated or controlled at the point or area Z in accordance with the inverted - U hypothesis . To achieve these circumstances , required certain techniques through a variety of procedures , both active and passive . active procedure itself means the activities carried out actively. Meanwhile , passive procedure means a person can control the appearance of surging emotions , otherwise known as autogenik.Teknik relaxation exercises were first developed by Edmund Jacobsen at the beginning of the 1930s . Jacobsen suggested that a person who is in a fully relaxed state will not show such an emotional response to loud noise surprised . in 1938 , Jacobsen designed a relaxation technique which later became the forerunner of the emergence of the so-called progressive relaxation exercise ( Progressive Relaxation Training ) .

With relaxation exercises , Jacobsen believes that one can be transformed into the muscles relax . At the same time , this practice reduces turbulent emotional reactions , both in the central nervous system and the autonomic nervous system . This exercise can increase the feeling of fresh and healthy . (systematic desensitization ) . This technique is used to deal with someone who has the problem of tension and anxiety . Those who need to be taught to perform the techniques themselves , with the appropriate use of biofeedback ( EMG ) . During its development , the techniques that are used , either by Jacobsen and Wolpe , is considered less efficient . Therefore , to then popping barn relaxation models as proposed by Bernstein & Borkovec ( 1973 ) and Bernstein & Geffen (1984 ) .

According to Masters , et al ( 1987) ( in Gunarsa , SD , 2002) , the benefits of progressive relaxation exercises are: Increased understanding of muscle tension . That is, there is an understanding that emotions affect muscle tension , and vice versa.

Increased ability to control muscle tension .

Increased ability to control cognitive activities , which include the ability of focusing on an object Increased ability to perform activities.

Decreased muscle tension.

The decline in emotional turmoil because of the influence of changes kefaalan .  
Reduced levels of anxiety, and other negative emotions .

Decreased anxiety and fear.

## **2 . Cognitive strategies**

Cognitive strategies based on the cognitive approach emphasizes that the mind or thought process is a source of power that exist in a person . Thus , errors , failures , or disappointments , is not caused by the object from the outside , but is essentially rooted in the core of mind or thought process of a person. For example , an athlete does not blame the swimming goggles , swimsuit worn because the incoming water in glasses and heavy clothes are consequences for the different speed than usual , because that determines whether or not the suit is swimming techniques and strategies is the power of the thought process of the athlete . So , that should be changed is the controlling behavior of athletes , in this case the strength of the movement technique or strategy when the race , in order to adapt to special circumstances . From this description , it appears that cognitive processes are the source of all behavior in athletes.

One of the activities that support the functioning of the cognitive process are sourced activities focusing on the core of one's mind . For example , the following thought : " I was focused on my kornitmen to play according to what I 've been practicing and playing my strategy . " This activity is an activity instructing oneself ( self - instruction) , so that whatever happens in the game , athletes will be guided by the thinking process . But in reality , cognitive strategies such as this is closely associated with the status of a wide range of emotions and pergolakannya . The upheaval comes from the level of stress experienced by athletes , particularly those rooted in him , namely trait anxiety .

## **3 . Tension Alleviation Techniques**

Just knowing " what " or " the what " just why athletes tense or afraid without knowing " the how " or " how " the way the healing is not a lot of benefits and it will not help the athlete . Therefore , the coach should also arm yourself with the skills how to defuse tensions in athletes. There are several techniques that can help lower or reduce tension athlete ( desensitizatioll , techniques) . Among other things :

Jacobson and Schultz technique , namely by reducing the importance of the game in the minds of athletes , or reduce the threat of punishment if the athlete fails.

Cratty techniques . With this technique , initially composed of a sequence (hierarchy) anxiety experienced by athletes , from the most to the least feared feared by athletes . At the beginning , athletes are faced with a situation that at least evoke anxiety . Once athletes are accustomed and no longer afraid of the situation , he then engaged in a fearful situation is somewhat more severe . And so on .

Progressive muscle relaxation technique of Jacobson , which exercises force the muscles to relax the tense used. Autogenic relaxation techniques , namely relaxation toknik The emphasis on self- suggestion ( self -suggestion). Deep breathing exercises ( deep breathing ) .

Meditatiotn. Think positive. Visualization. Simulation exercise : at the time of exercise , practice by creating a situation as if it were really true  $\rightarrow$  compete , and try to perform as well as well  $\rightarrow$  . Do exercises with high intensity as in the game actually . Let the athlete's physical and mental stress . By repeatedly practicing with high stress , tension over time is expected to be reduced at the time athletes deal with stress .

#### **4 . Defense mechanism**

Anxiety , worries , and fears that raged inside of athletes is a common symptom in sports . Anxiety and fear is a reaction to feeling " worried about his personal danger " . Because anxiety experienced by athletes is something very bad state and will forever raging in the life of an athlete , it takes on the personality of a mechanism for inenolongitya inengotasi or ineinbabaskan himself from the anxiety . This mechanism is usually called security or defense inechanisin operation . So this mechanism serves as alai that his personality did not feel threatened . Often this mechanism works so effectively that true athletes ,  $\neg$  completely shielded from the anxious feelings .

It seems that in all sports such common defense mechanism , not only by athletes , but also by coaches , team managers , administrators and others . It is possible that the reasons put forward an athlete , coach , team manager , Board , KONI , etc. it is true because the slippery pitch , the ball is not round , a lot of wind , the crowd noise. But most of the reason is not rational and only a manifestation of feeling frustrated due to failure , as well as a cover to avoid feelings of anxiety and fear of criticism , in - ridicule , condemned by society , and that they are not blamed by the community for their defeat or failure . Because the cause of the failure is delegated to a person or other object outside himself.

As coaches , we need to educate and train the athletes that do not get used to using defense inechanisin unnatural as the examples above . The causes of each failure should be discussed , evaluated , analyzed rationally , intellectually and intelligence . Coaches must teach and educate athletes so as not to underestimate the failure , and the failure to fully assess any sense of understanding and reasonable . Thus it can be expected also that the mental maturity of the athletes can gradually be developed.

#### **CONCLUSION**

From the discussion above, the writer can conclude , among others : That ( a ) the athlete must be trained to the level of anxiety , stress and tension increasingly lower ( but do not disappear altogether ) , and ( b ) further enhanced his ambition to win . Become increasingly important to provide relief exercises anxiety , stress and tension to the athletes. Instructions anxiety and anxiety relief will be effective when given at the eve of the beginning and end of the game .

#### **ADVICE**

Discussing about the anxiety and stress in sport as well as control then there are some suggestions that can be highlighted in this paper include: In understanding the anxiety and stress in sport as well as expected each individual is able to control and understand about anxiety and stress in sport as well as control . In essence, each individual is expected to understand the anxiety and stress in sport as well as the control , ie, a family of educators and policy makers interested in it as a place or container educational developers to become more widespread in education perkembangan sports psychology, especially the development of physical education and sport.

Anxiety and stress in sport and its control can not be separated because they are mutually influence in improving and developing the athlete's performance .

#### **REFERENCES**

<http://gatotjariono.blogspot.com/2010/02/psikologi-olahraga.html>

Singgih D. Gunarso . ( 1996) Theory and Practice of Sport Psychology . Jakarta : Mountain Majesty .

Weinberg and Gould . ( 2007) . Foundations of Sport and Exercise Phychology . Human Kinetics .

# **EFFECT OF SENSITIVITY PROPRIOCEPTIVE AND PLYOMETRIC TRAINING FOR JUMP SERVE SUCCESS ON VOLLEYBALL**

**Syarif Hidayat**

**Ganesha Education University  
hidayat\_s77@yahoo.co.id**

## **Abstract**

This study aimed at investigating the success of jumping serve on volleyball by taking attention on the level of proprioceptive sensibility toward the members pembinaan prestasi bolavoli at FOK Undiksha Singaraja who were given plyometric depth jump and plyometric split squat jump. This study used quasi experimental design with factorial design 2X2. The population of this study were the members pembinaan prestasi bolavoli at FOK of Ganesha University of Education especially the male involving around 54 people totally. The results of the study showed that: (1) there was a significant different on the jumping serve between two groups of students having high proprioceptive sensibility and low Proprioceptive sensibility where every group was taught through plyometric depth jump. (2) There was a different result between two groups of students who had high level of proprioceptive sensibility and low level of proprioceptive sensibility trained through plyometric split squat jump. (3) There was a different result of the students having high level of proprioceptive sensibility trained through plyometric depth jump and plyometric split squat jump training. (4) There was a different result between groups having low level of proprioceptive sensibility who were trained through plyometric depth jump and those taught through split squat jump training. (5) There was a different result between groups taught through plyometric depth jump and those who were taught through split squat jump training ( $F_{\text{account}} = 4,18 > F_t = 4,11$ ) (6) There was no any interaction between proprioceptive sensibility and plyometric training which could influence the result of jumping serve in volleyball

## **INTRODUCTION**

Volleyball game continues to progress from year to year both in terms of the game, rules, actors, fans of the game and supporting facilities. Adult volleyball game development is not independent of the results of research and study by experts volleyball games, especially the members of the organization's international volleyball (FIVB). Science and Technology (Science and Technology) sports especially volleyball sports field being developed in particular about the training process for the betterment of the sport. The coaches volleyball at the present time it is time to leave traditional training methods, meaning that training methods are not growing from year to year and unchanged. It is still often found in areas far from the center of the development of volleyball. Now it is time they are required to be able to apply the methods of training that is tailored to the results of research and sports science and technology, meaning that the volleyball coach must actively follow and applying the results of research and science and technology branch of sports especially volleyball.

Volleyball game that was originally only for leisure but now the game is developing, among others, to maintain the health, education and performance improvement. To be able to play volleyball, especially to improve the performance required perseverance, patience and the use of proper training methods, so that the training can achieve the expected results.

The application of training methods in particular aspects of the proper techniques will help control techniques volleyball game perfectly on any individual (athlete). Perfect technical mastery of each athlete will have an effect on the appearance volleyball team, as the game volleyball is a team sport. In volleyball training process many emerging problems, particularly



in the provision of basic engineering material , so if it is not addressed it will hinder efforts to render advanced techniques in the game .

Along with the improvement of the game , equipment ( facilities ) and regulation volleyball game , then it is appropriate volleyball training methods must also continue to experience improvements in order to improve the game . When volleyball changed from a recreational sports activity into a competitive sport , everyone is aware that the attacks in the volleyball game is more dominant than the defense . Developments in the volleyball game one of them is the use of point relaysystem , which is a team that managed to shut the opponent is entitled to retain the value (pp. PBVSI 2005) . So all the basic techniques in volleyball game must excel at , one of which is a service techniques , which are mainly service attack , one of which is a service to skip ( jump serve ) .

Skip service is a service that resembles the implementation of the smash , which is served in a way athletes toss the ball over the front of the head , then the athlete achieve the highest possible jump and hit the ball hard towards the opponent field without breaking the rules that apply in the volleyball game.

## METHODS

Type and Design Research .

This research is a quasi experimental study ( quasi –experimentThe study design used is as follows :

Proprioseptif (A) <i>Plyometric (B)</i>	Tinggi (A1)	Rendah (A2)
Depth Jump (B1)	A1B1	A2B1
Split Squat Jump (B2)	A1B2	A2B2

Population and SampleIn this research study population are students that follow perkulihan volleyball coaching achievements in FOK Ganesha Education University of Singaraja Bali around 54 people .while the sample is the son who followed perkulihan student achievement coaching volleyball in Singaraja Bali FOK Undiksha academic year 2008/2009 amounted to 40 people .

DataCollectionandProcessingTechniques.In this study, the data obtained with the test and measurement . For the success of the above services will be used to skip the test of AAHPER in Strand and Wilson (1993 ) , while the implementation of proprioceptive sensitivity tests used for distanceperceptionjump(BarryL.andJackK.1974)

## RESULTS

DataSensitivityTestResultsproprioceptive . Data proprioceptive sensitivity level of the test results obtained through proprioceptive sensitivity tests were conducted on Thursday, April 9th, 2009 at 15:00 pm -18.00 pm . Based on the attachment in this study total of 54 SME members volleyball Ganesha Education University Singarja follow proprioceptive sensitivity level of the test after the data are sorted from smallest to largest , then obtained the lowest score is 13 and the largest is 107.9 . Expressed as a median score of 56.95 . To ensure a significant difference ( extreme ) , then scores 13 to 39.7 twenty- categorized athletes have high levels of proprioceptive sensitivity , whereas a score of 60.8 to 107.9 twenty athletes categorized as having a low level of proprioceptive sensitivity . Score with a score of 40.4 to 57.5 fourteen people not research sample . To obtain a sample of forty people .Preliminary Test Results Data ( pre-test ) Skip service success

The data results of initial tests ( pre-test ) results obtained by testing services jump jump serve in volleyball game held on Thursday 9 April 2009 . Meanwhile servicing skip the pre-test

results for high proprioceptive group will be treated depth jump plyometric training methods have a mean score of 9.7 . Based on the average scores of 40% achieving a score above the average and 60 % achieved a score below average.High proprioceptive group will be treated plyometric training methods have split squat jump an average score of 13.1 . Based on the average scores of 40% achieving a score above the average and 60 % achieved a score below average. Low proprioceptive group will be treated depth jump plyometric training methods have a mean score of 28.2 .

Based on the average scores of 40% achieving a score above the average and 60 %achieved a score below average.While the group will be treated low proprioceptive plyometric training methods split squat jumps have average mean score of 25.8 . Based on the average scores of 60 % achieving a score above the average and 40 % achieved a score below average. Final Test Data ( post-test ) Skip service successData resulting from the initial end ( post-test ) servicing skip skip service obtained through tests conducted on Tuesday, June 9, 2009 . Meanwhile skip servicing post test results for high proprioceptive group will be treated plyometrik depth jump training methods achieve an average score of 10.8 . Based on the average scores of 40% achieving a score above the average and 60 % achieved a score below average. High proprioceptive group will be treated plyometric training methods split squat jump achieving an average score of 12.2 . Based on the average scores of 40% achieving a score above the average and 60 % achieved a score below average.Low proprioceptive group will be treated depth jump plyometric training methods achieve an average score of 28.4 . Based on the average scores of 40% achieving above-average scores , and 60 % achieved a score below average. Low proprioceptive group will be treated method split squat jump training plyometrics achieve average mean score was 27.9 . Based on the average scores of 60 % achieving above-average scores and 40 % have scores below average.Data Gain Score

Gain score group A1B1Data services gain scores skip success obtained by reducing the value of the final test results ( post-test ) with the results of the initial test scores ( pre-test ) .Based on calculations it is known that the gain obtained the highest score is 7 and lowest is -7 average value was 2.1 with a standard deviation of 4.629Gain score A1B2 group. Based on calculations it is known that gain the highest score obtained was 3 and the lowest is -8 average value is -0.9 with a standard deviation of 4.012Gain score group A2B1. Based on calculations it is known that the gain obtained the highest score is 8 and the lowest is -7 average value was 0.2 with a standard deviation of 4.211 .Gain score a2b2 group. Based on calculations it is known that the gain obtained the highest score is 7 and lowest is -6 average value was 2.1 with a standard deviation of 3.842Gain score group A1B1 and A2B1. Based on calculations it is known that the gain obtained the highest score is 8 and the lowest is -7 average value was 0.65 with a range of values from 15 samples of 20 . Standard deviation of 4.331.

Gain score group A1B2 and a2b2Based on calculations it is known that the gain obtained the highest score is 7 and lowest is -8 average value of 0.6 with a range of 15 values of 20 samples . Standard deviation of 4 , 121 .Gain score group A1B1 and A1B2Based on calculations it is known that the gain obtained the highest score is 7 and lowest is -8 average value of 0.10 with a range of 15 values of 20samples . Standard deviation of 4 , 33 . Gain score group A2B1 and a2b2Based on calculations it is known that the gain obtained the highest score is 8 and the lowest is -7 average value was 1.15 with a range of 15 values for 20 samples with a standard deviation of 4.042 Frequency Distribution Normality TestTesting for normality of distribution of data using Lilliefors test imposed on the four groups of data .stated that all of the data treatment group had statistical value ( Lilliefors test ) all states greater than  $\alpha = 0.05$  . This means that the data are normally distributed in this studyTest of Homogeneity of VarianceTesting homogeneity of variance performed on the data service gain success score jump .of the results using SPSS stated that the calculation of the value of the Levene test is significant based on the average value (based on the mean ) of 0.931 .

This value is greater than 0.05 , then the data can be inferred gain scores jump comes from the success of a service which has a population of variants of a homogeneous A. Hypothesis TestingThe difference results in the game volleyball jump serve A1B1 and A2B1

group. From the calculations, the price of the F count (  $F_1$  ), was greater than the value of F. Where the calculated  $F = 6.245 > F = 4.11$  .thus the null hypothesis (  $H_0$  ) is rejected . Therefore, the alternative hypothesis that states there is difference in the outcome servicing skip volleyball game between groups of students with a high level of sensitivity and proprioceptive group of students with a low level of proprioceptive sensitivity , each group underwent plyometric depth jump training , is accepted at significance level  $\alpha = 0,05$  . group is better than A2B1 A1B1.

The difference results in servicing skip volleyball game between the A1B2 and a2b2 From the calculations, the price of the F count (  $F_1$  ), was greater than the value of F table . Where the calculated  $F = 6.245 > F_t = 4.11$  .thus the null hypothesis (  $H_0$  ) is rejected . Therefore, the alternative hypothesis that states there is difference in the outcome servicing skip volleyball game between groups of students with a high level of sensitivity and proprioceptive group of students with a low level of proprioceptive sensitivity , each group underwent split squats plyometric jump training , accepted at significance level  $\alpha = 0.05$  . Better than a2b2 group A1B2 group .

The difference results skip service at volleyball game in the group A1B1 and A1B2 From the calculations, the price of the F count (  $F_1$  ), was greater than the value of F table . Where the calculated  $F = 4.18 > = 4.11 F_t$  .thus the null hypothesis (  $H_0$  ) is rejected . Therefore, the alternative hypothesis that states there is difference results in the game volleyball jump serve on the group of students with a high level of sensitivity proprioceptive given depth jump plyometric training and plyometric training split squat jump , accepted at the significance level  $\alpha = 0.05$  . Better group A1B1 A1B2 group .The difference results skip service at volleyball game in the group A2B1 and a2b2.

From the calculations, the price of the F count (  $F_1$  ), was greater than the value of F. Where the calculated  $F = 4.18 > F = 4.11$  .thus the null hypothesis (  $H_0$  ) is rejected . Therefore, the alternative hypothesis that states there is difference results volleyball jump serve on the group of students who have low levels of proprioceptive sensitivity given plyometrik depth jump training methods and training methods plyometrik split squat jump , accepted at the significance level  $\alpha = 0.05$  . a2b2 group better than A2B1 group .The difference results volleyball jump serve in groups B1 and B2

From the calculations, the price of the F count (  $F_1$  ), was greater than the value of F table . Where the calculated  $F = 4.18 > = 4.11 F_t$  .thus the null hypothesis (  $H_0$  ) is rejected . Therefore, the alternative hypothesis stating no difference in outcome volleyball jump serve on a given student group depth jump plyometric training and plyometric training split squat jump , accepted with a significance level  $\alpha = 0.05$  . group B1 is better than B2The interaction between the level of sensitivity and proprioceptive training plyomterik can affect the results of the game volleyball jump serve

From the calculations, the price of the F count (  $F_1$  ), is smaller than the value of F table . Where the calculated  $F = 0.013 > F_t = 4.11$  .thus the null hypothesis (  $H_0$  ) is accepted , it can be stated that there is no interaction between the levels of sensitivity and proprioceptive training plyomteric that can affect the results of the game volleyball jump serve.

## DISCUSSION

Effect of Plyometric Training Plyometric Depth Jump and Split Squat Jump Training Success Services In SkipHypothesis test results showed that the group of students who are given treatment plyometric depth jump over deliver greater results if given to a group of students who have high levels of proprioceptive sensitivity . It can be seen from the average value of a group of students who have a high level of sensitivity that are subjected proprioceptive plyometric depth jump training at 1.1 while a group of students who have low levels of sensitivity are treated proprioceptive plyometric depth jump training by 0.2 .As for the groups with low levels of proprioceptive sensitivity over deliver great results on the success of volleyball jump serve if given plyometric training methods split squat jump . It can be seen the average value of a group of students who have low levels of sensitivity proprioceptive plyometric training that are

subjected to a split squat jump of 2.1 , while a group of students who have a high level of sensitivity proprioceptive plyometric training that are subjected to a split squat jump at -0.9In the power limb development efforts , particularly the use of plyometric training methods to increase the success of the jump serve , then a coach should consider the characteristics of each athlete . This is in accordance with the principles of training must be individualized . According Harsono (1988 ) stated that the training program should be prepared in accordance with the characteristics of each individual athlete.

This can be done in the implementation of individualized techniques in the game of volleyball , for example , among others, serve and passing techniques . According to Bompa (1994 )menyataka that the principle of individualization is a major requirement of the exercise and is different for every athlete . To understand the characteristics of each athlete that a coach must have data about kelebihan and shortage of athletes . Data on this bus only be obtained by conducting periodic tests and measurements , data on the physical, mental and technical . The research that has been conducted by the authors have conducted tests on proprioceptive sensitivity and the results obtained state that the same form of exercise that does not give the same results for the sensitivity of proprioceptive relatively equal , so that the principle of the individual in the process of training must be considered in the process of sports training .Efforts to improve the success of servicing skip one of them is the increase in power one power leg . Power is one of the basic components of motor skills or abilities that support effective performance in sports and games ( Kirkendall et al , in Lopez ) .

One method that can be used to increase power is plyometric training method , as stated by Kartiko (2006), that the plyometric exercise is a form of load-bearing exercise , which could give an advantage to increase the explosive power of plyometric training muscles , while according Nala (1998 ) , plyometric training sebagaai considered one of the effective training to increase power , one of the volleyball players . The success of the service is strongly influenced by the ability to skip a person or athlete to reach the ball as high as possible , so that the ball will hit the track crosses a small angle so the ball receiver ( receiver ) was difficult . This means that the ability to play volleyball jump serve not only the dominant factor technique , but donations fine shape factor was also very influential . Both of these affect each other . The smaller the angle formed by the trajectory of the ball skip a serve , then the recipient will be increasingly difficult to athletes who have great leg power very beneficial in the volleyball game , because most of the techniques implemented in volleyball jump .

Interaction Between Sensitivity proprioceptive and plyometric training that may impact the service results Skip On Games volleyballIn accordance with the hypothesis test for the interaction between proprioceptive sensitivity and plyometric training can affect the outcome of the game volleyball jump serve is stated that there is no interaction between the sensitivity of proprioceptive and plyometric training can affect the outcome of the game volleyball jump serve . It could happen were:

Plyometric training model can not increase the sensitivity of proprioceptive and proprioceptive sensitivity also can not affect limb powerActivities outside of training researchers can not control the activities of the samples . This is because the sample of a student who mostly come from the Faculty of Sports and Health Education University of Ganesha . This is related to the sample before the fitness plyometric trainingAlthough there are some limitations mentioned above , at least researchers through the research that has been done to provide real information about the influence of the sensitivity of proprioceptive and plyometric training on the success of the gamevolleyball jump serve

## CONCLUSION

knot

Based on the results of research and discussion , the results of this study it can be concluded that

- 1 . Results servicing skip the volleyball game between groups of students with a high level of proprioceptive sensitivity is better than the group of students with a low level of proprioceptive sensitivity , each group underwent plyometric depth jump training .
2. Results servicing skip the volleyball game between a group of students who undergo training split plyometric jump squats with a low level of proprioceptive sensitivity is better than the group of students with a high level of proprioceptive sensitivity .
3. Results servicing skip the volleyball game in the group of students with a high level of sensitivity given proprioceptive plyometric depth jump training is better than the group of students with a high level of sensitivity given proprioceptive plyometric training split squat jump .
4. Results servicing skip the volleyball game in the group of students with a low level of sensitivity of the method plyometrik proprioceptive split squat jump better than the group of students who are given training plyometric depth jump
5. Results volleyball jump serve on a given student group plyometric depth jump training is better than a given group of students split squats plyometric jump training
6. There is no interaction between the sensitivity of proprioceptive and plyometric training can affect the results of the game volleyball jump serve .

Advice Having regard to the above conclusion , the researchers have some suggestions as follows

- 1 . The sport volleyball coaches in an effort to enhance the athlete 's ability to achieve value ( point) when the game should improve the ability of service is one of the services that are attacking Serviced jump ( jump serve ) . But the skip service training is very important to pay attention to the ability of the athlete's physical , technical and mental .
2. Particularly in the selection of training methods to improve power leg , the coach must be careful and precise in the preparation of training programs for the purpose of training can be achieved .
3. To other researchers who are interested in researching about servicing skip the volleyball game can develop from the results of this study , both the method and the other supporting factors .

## REFERENCES

- Bompa, T. 1994. Terjemahan: *Theory And Methodology Of Training*. Bandung. Pascasarjana UNPAD
- 1999. *Periodization: Theory And Methodology Of Training*. York University. Iowa. Human Kinetic.
- Chu, D. 1996. *Explosive Power And Training*. Iowa. Human Kinetics Publishers, Inc.
- 1998. *Jumping Into Plyometrics*. Iowa Human Kinetics Publishers, Inc
- Foss, L.S., And Keteyian, SJ. 1998. *Fox,s Physiological Basic For Exercise And Sport*. WCB McGraw- Hill.
- Harsono.1988. *Coaching dan Aspek-Aspek Psikologis Dalam Coaching*. Bandung. CV. Tambak Kusuma

<http://www.yusovolley.org/articles-detail/1.html>

<http://sekolahalambandung.com/blogs/2005/09/29/training-psikologi-di-sab/>

[http://www.kesulitanbelajar.org/index.php?option=com\\_content&task=view&id=33&Itemid=2](http://www.kesulitanbelajar.org/index.php?option=com_content&task=view&id=33&Itemid=2)

Johnson, L.B., And Nelson, JK. 1974. *Practical Measurement For Evaluation In Physical Education*. Minnesota. Burgess Publishing Company.

Kartiko, Dwi “Beda Pengaruh Latihan Pliometrik Konvensional Dan Modifikasi Terhadap Daya Ledak Otot dan Kelincahan”<http://www.adln.lib.unair.ac.id/go.phd>

Lubis, J.”Menenal Latihan Plyometrik” dalam [http://www.koni.or.id/files/documents/journal/mengenallatihan\\_pliometrik.pdf](http://www.koni.or.id/files/documents/journal/mengenallatihan_pliometrik.pdf)

Marhaento, P. “Metode Latihan Beban Reactive Strength Dalam Permainan Bolavoli”. Jurnal Olahraga Prestasi. Volume 1. Nomor 1. Januari 2005. pp. 87-106.

Mariyanto. 1997. *Permainan Besar II (Bolavoli)*. Jakarta. Depdikbud.

Mawarti 1999. “Latihan *Plyometrics* Untuk Pemain Bolavoli”. Olahraga. Volume 5. Nomor 2. Agustus 1999. pp. 32-39.

Nala, Ngurah. 1998. *Prinsip Pelatihan Fisik Olahraga*. Denpasar: Program Pasca Sarjana Studi Fisiologi Olahraga Universitas Udayana Denpasar.

Pyke, F.S. 2001, *Better Coaching Advanced Coach's Manual*, Australia : Australian Sport Commision.

Sharkey, B.J., And Gaskill, S. 2006. *Sport Physiology For Coaches*. Human Kinetics Publisher

Strand, B. And Wilson, R. 1993. *Assesing Sport Skills*. Human Kinetics Publisher.

Suharno. 1989. “Ilmu Kepelatihan Olahraga”. Makalah disajikan Pada Kursus Wasit Dan Pelatih Bolavoli Tingkat Nasional, FPOK IKIP Yogyakarta.

Sukadiyanto. 1999 “Tenis Mini: Metode Pembelajaran Menuju permainan Tenis”. Olahraga. Volume 5. Nomor 2. Agustus 1999.pp. 97-109.

PP. PBVSI 1995.*Kepelatihan Bolavoli*. Jakarta

PP.PBVSI. 2005-2008. *Peraturan Permainan Bolavoli*. Jakarta

Widodo, T. 2005. “Kepekaan Kinestetika Dalam Pembelajaran Gerak”. Makalah Komprehensif Magister Pendidikan Olahraga, Universitas Negeri Surabaya.

Whinata, D.K. 2007.”Sumbangan Kepekaan Kinestetika, Kelentukan Pergelangan Tangan Dan Kekuatan Otot Lengan Kepada Keberhasilan Servis Atas Bolavoli (Studi Pada Pemain Bolavoli Putera Pemusatan Latihan Cabang Sumenep)”. Tesis Magister Pendidikan Olahraga, Universitas Negeri Surabaya.

Yunus 1992. *Olahraga Pilihan Bolavoli*. Jakarta. Depdikbud.

# ANALYSIS OF THE GRAND STRATEGY OF NATIONAL SPORT PERFORMANCE DEVELOPMENT OF 2014 - 2024

Wawan S. Suherman

Yogyakarta State University, Indonesia  
wansuherman@uny.ac.id

## Abstract

This article analyzes the Grand Strategy of National Sport Performance Development of 2014 - 2024. The analysis employs the public policy model by Joko Widodo (2008), which is an applied descriptive analysis in nature, focusing on the content analysis. The targets are to analyze (1) the main determinant factors, (2) policy contents, and (3) expected and not expected effects of the policy. The results of the analysis show that GSPOPON 2014 - 2024 are adequate and sufficient to meet the requirements to be a public policy document. As a strategic planning document, GSPOPON 2014 - 2024 already has a set of targets, general program needs to be equipped with the annual implementation period, SOP or guidelines for the program implementation and programs implementation control need to be added. By complementing the existing shortcomings, we hope that GSPOPON 2014 - 2024 can be a guide for all sports society in improving the national sport achievements.

**Keywords:** public policy analysis, grand strategy of sport performance

## INTRODUCTION

Sport is one of the results of human thought. Therefore, the sport would not be separated from people's daily life. Given that the sport has a typical position and has a universal value, many countries, including Indonesia, using sport as a form of vehicle, to demonstrate the existence, and the civilized nation. Sport is regarded as one powerful tool for promotion. Many world-class athletes even more famous than the president. Sport is a powerful promotional tool, because sports activities involving many people, from athletes to spectators, many funding and media support it.. With the sophistication of information technology, a popular sports activities can involve millions of people at the same time. For example, every game in the World Cup will involve millions of people either directly or indirectly around the world, so that the football player will soon be famous throughout the world, if he has a achievements that can be remembered by the world population.

Because of the potential and the characteristics and the role of sport, which is so huge, the Indonesian government has set the sport, as a vehicle for national development, as stated in Law No. 3/2005 on National Sports System chapter 4:

“national sports are aimed at maintaining and improving health and fitness, achievement, human qualities, embedding moral values and noble character, sportsmanship, discipline, strengthen and nurture national unity, strengthen national security, as well as lifting the dignity and honor of the nation. ”

In order for the development and utilization of sports, as a vehicle for development of the nation can be run effectively and efficiently, the government delegate some of its authority to the competent institution, as set forth in Article 36 paragraph (4) of the Law of the Republic of Indonesia No. 3 of 2005 on National Sports System, KONI is assigned to assist the government in making national policy in the field of management, coaching, and development of national level sporting achievements. In this task, embodied meaning that KONI has an obligation to improve the national sports achievements, in order to increase the dignity of the Indonesian people. Efforts to achieve these goals, starting with preparing the Grand Strategy of National

Sports Performance Development of 2014-2024 (GSPOP 2014-2024). Grand strategy is a big step up from the board, which needs to be socialized to the sports society, especially from Indonesia, and Indonesian society in general.

As a part of sports society, we need to take part in the socialization of the document through an analysis of the 2014-2024 GSPOP, so that KONI received inputs, based on scientific studies. Therefore, this article will attempt to examine GSPOP 2014-2024, using the type of applied analysis. This type of analysis focuses more on the relationship of the content of the policy to the policy impact, as well as more policy-oriented evaluation. Practice analysis is expected to find a better alternative, and the proposed improvements to the existing policy analysis of Joko Widodo, the analysis emphasizes the study of the content (content analysis), especially on purpose, problem definition, objectives and orientation of a policy (Hykurniawan, 2008: 2).

Based on those reasons, the study of GSPOP 2014-2024 will be preceded by a discussion on (1) whether GSPOP 2014-2024 is a public policy that needs to be analyzed? Because the analysis will use public policy analysis by Joko Widodo, the analysis will proceed by reviewing (2) the three elements of GSPOP 2014-2024: (a) the main determinant factor, (b) the content of the policy, and (c) the expected impact of both the policy and anything not expected to be analyzed? and (3) how is the results of an analysis of the Grand Strategy?

#### **GRAND STRATEGY OF NATIONAL SPORT DEVELOPMENT OF 2014 - 2024**

An organization needs strategic management, if they are to succeed in the implementation of the program, which is set, and can withstand the ever-changing environment. Grand strategy is the manifestation of strategic management, which is set by an organization. Daft (2014) stated that strategic management is the set of decisions and actions used to formulate and implement strategies that will provide a competitively superior fit between the organization and its environment so as to achieve organizational goals. Superior organizational performance is not a matter of luck. It is determined by the choices that managers make. Top executives use strategic management to define an overall direction for the organization, which is the organization's grand strategy. Grand strategy is the general plan of major action by which an organization intends to achieve its long-term goals.

KONI as a great professional organization, of course, requires a Grand Strategy, as a guide to run the organization in the achievement of goals, which have been defined. Republic of Indonesia Law No. 3 of 2005 on National Sports System, Article Article 36 paragraph (4) gives a task to the KONI to assist the government in the national policy-making in the field of management, coaching, and development of the national level sporting achievements. In relation with these duties, management KONI period 2011 - 2015 has compiled the Grand Strategy of National Sport Performance of 2014 - 2024.

Grand strategy is an elaboration of vision of Central of KONI as a professional organization assigned by the government to improve the national sports achievements to raise the dignity of the nation in the international arena. The document GSPOP 2014 - 2024 consists of six chapters that cover (1) Introduction, (2) the mapping of the legal basis, the authority's main tasks, functions, responsibilities for program distribution, breeding, and coaching, in sports performance by stakeholders based on rules and legislation, (3) the mapping of program distribution, breeding, and coaching, in athletic performance by stakeholders and constraints encountered, (4) performance athletic development strategy through strengthening the program of gold Indonesia, (5) goals and targets, and (6) conclusions and recommendations.

Taking into account the structure of GSPOP 2014 - 2024, shows that the the KONI Grand Strategy is a strategy for coordinating with various stakeholder institutions within the framework of the development of sports the national sports achievements. Although the internal program the KONI is also discussed, but the Grand strategy focuses discussion on coordinating implementation of development program of sporting achievement with other stakeholders. However, Grand strategy has long-term goals are clear and measurable, with the goals and



targets. Of these things, GSPOP 2014 - 2024 has not been fully comply with the limits grand strategy, which is stated above.

### **GSPOP 2014-2024 AS PUBLIC POLICY**

Riant Nugroho (2011: 30-34) stated that to understand public policy, there are two parties, namely kontinentalis and anglo-Saxonis. According to Kontinentalis, public policy is a product of the state / government / bureaucracy / public administration to regulate the management of national and state. The Anglo-Saxonis assume that public development policy as a product of interaction or meeting of interests between the state and its people.

In Indonesia, public policy more understandable by using flow kontinentalis. Therefore, Riant Nugroho (2011: 3) stated that the use of kontinentalis to understand public policy, resulted in agreement that the law is one of public policy, both in terms of form, as well as product, process, or in terms of the charge. In terms of product or entity, public policy may be legal, it can also be a convention or agreement. In terms of process, the law is a product of a country or government, so that the position of the people or the public more as a receiver or products receiver as a result of the behavior of the State. Based on this understanding, public policy in Indonesia has the characteristics of (1) policies are made by state institutions, the executive, legislative, and judicial branches, (2) policies that govern the society life or public life, and not govern life of individuals, shared problems, all of which are in public areas, and (3) have a good level of utilization by the user both directly or indirectly.

Furthermore, Riant Nugroho (2011: 104), simply categorize shape of public policy into three, namely: (1) macro of public policy or public, (2) of public policy that is meso or intermediate, and (3) of public policy micro programs, which is policies that govern the execution or implementation of the policy above it.

Noting on that understanding can show that the Grand Strategy of National Sport Performance Development of 2014 - 2024 is a form of public policy. Although Grand strategy is not issued by the government, but by Act No. 3 of 2005, the KONI as an authorized agency to help the government formulate the national policy in the field of sports achievement. Taking into account the characteristics of Grand Strategy, and match it to the category of public policy expressed by Riant Nugroho, showed that GSPOP 2014-2024, is a public policy that is common on the macro or the national level.

### **ANALIZED ELEMENT OF GSPOP 2014 – 2024**

Public policy analysis is a process to carefully reviewing the policies issued by the government or public institutions. The policy needs to be analyzed because it affects the livelihood of the public. Based on these limits, the analysis of public policy are: (1) the process of cognitive activity, which is associated with the process of learning and thinking. (2) the result of the collective activity, because the existence of a policy inevitably involves many parties, and based on a collective and organized knowledge about the problems that exist, (3) intellectual discipline applied, which is reflective, creative, imaginative and exploratory. (4) the process of analysis relating to public issues, not personal even though the problem involves a lot of people.

Taking into account the limitations and characteristics of public policy analysis in the above, and considering the public policy analysis model proposed by Joko Widodo (2008) which stated that the public policy element that should be analyzed are three things, namely (1) the main determinant factors, (2) the content of the policy and (3) the impact of policies, both of which are expected, or not expected.

By using public policy analysis models by Joko Widodo (2008), and in order to obtain an adequate analysis results, the element "GSPOP 2014-2024", which became a target for analysis are (1) the main determinant factor of GSPOP 2014-2024; (2) the content or substance of the policies contained in GSPOP 2014-2024, and (3) the impact of policies in GSPOP 2014-2024, both expected and not expected.

## RESULTS OF ANALYSIS

Nationally, policies governing the sport in general, that containing a provision regarding the role and function of KONI, outlined in Law of the Republic of Indonesia No. 3/2005 on the National Sports System. For its derivatives, the government issued some government regulation, including the Indonesian Government Regulation No. 16 of 2007 on the Implementation of Sport; Indonesian Government Regulation Number 17 of 2007 on Week and Championship Sports, and the Indonesian Government Regulation No. 18 of 2007 on Financing for Sport. Policy on the development of national sporting achievements outlined in policy of **distribution**, breeding, and sports achievements coaching. This policy is documented in the form of GSPOP 2014 - 2024 prepared by the management of KONI period 2011-2015.

General conditions underlying the establishment of a national development strategy of sports achievements compiled by KONI listed in Chapter I Introduction. Introduction Chapter I contains the general conditions of the history and achievements of the national sports, the national movement of Indonesian sports coaching accomplishments, and distribution, breeding, development, and sports achievements coaching. This chapter contains a general overview of Indonesia's sports achievements. The data shows that Indonesia's sports achievements showed a decrease compared with sporting achievement previous years.

To optimize the participation of all stakeholders in the development of national sports achievement, KONI and the Government continues to improve the coordination of the implementation of the program distribution, breeding, development and sports coaching accomplishments by compiling GSPOP 2014-2024. Through this GSPOP, KONI seeks to explain the role, function, and authority of the relevant institutions and the achievement of national development goals sports. In addition, awareness of the importance of the development of national sporting achievements, in terms of improving the dignity, and the dignity of the nation, needs to be developed, because it is necessary, so that the development of sport achievement is not only the responsibility of governments, but also become part of the active participation of the community.

In addition to the general conditions is written in the Chapter I Introduction, it is also necessary to observe the general condition of achievement, and sports the development implicit in the fact happened in the community. Development of national sporting achievements are still facing obstacles such as, lack of coordination among institutional stakeholders, because the management and implementation of the program still looks exclusive and not mutually supportive and not sustainable. Resource quality conditions for the sports has not been evenly distributed throughout the area. In addition, Indonesia's geographic conditions are so large and yet uneven regional capabilities in handling sports development. Meanwhile, infrastructure and sports facilities both in quantity and quality is not adequate to accommodate all activities of sports achievement improvement.

Overall, the implementation of decentralization and regional autonomy that has been entered into the eighth year, still has not shown sufficient support to the achievement of a comprehensive sports development because not all areas carry out the mandate of Law National Sports System, that is, establish institutions that manage the sport. This condition causes the achievement of sports development management, which is not yet effective, and efficient. lack of institutional structure between regions, causing division of roles and responsibilities between the central, province, and district/city are not strong. In addition, the contribution of local government in the provision of sports development budget is inadequate. But it is expected, with the release of GSPOP 2014 - 2024, Distribution of Duties and Functions of the Central Government, Province, Regency / City, KONI, and Parent Organizations of Sport in national sports achievement development becomes clearer.

Taking into account the general condition of the development of national sports achievement, either express inside the document of GSPOP 2014 - 2024, as well as those implied in real life in the field as presented above, then by using a model of public policy analysis from Joko Widodo (2008) who suggested that the analysis focuses the study of the three elements of the policy. The results of the analysis presented as follows.

## **1. Main Determinant Factors**

Looking at background or general conditions presented in GSPOP 2014 – 2024, it shows that the Grand strategy has sufficient basis, so that the program assigned to reach all sectors of the national sports development stakeholders. Nevertheless, the general condition of things has not been revealed: (1) the implementation gap between the achievement of sports development program of government, and KONI, (2) The concerns to the development of sport achievement discrepancies between stakeholders, is not explicitly stated because no institution assigned as its leading sector, (3) as a system of sports coaching that is interrelated, and affected, the reciprocal relationship between recreational sport, sport education, and sports achievements need to be discussed and described adequately, and (4) the promotion of internal programs of KONI as the main focus of the Grand strategy.

In addition to the factors above, another major determinant factors that need to be observed is, the division of duties, and the authority of the stakeholders who have not been substantiated by meso and micro policies. Such arrangements should also be equipped with coordination arrangements between stakeholders and the establishment of its leading sector. Information about sports achievements that have been achieved should be complemented with the results of the analysis on the effectiveness and efficiency of these achievements, so that the analysis can be used as a solid foundation to determine targets or performance indicators.

The availability of funding is a determinant factor for the development of sports achievement. Therefore, the fund-raising and management development programs need to get the attention of sporting achievement and set carefully. Although there has been government regulation governing the funding of sporting activities, but the ability of governments and private sector in the implementation in the field is far from the truth.

## **2. Contents or substance of policy**

Looking at whole document GSPOP 2014 - 2024, especially Chapter 4 on sports development strategy through strengthening program achievement Indonesian gold, and Chapter 5 about goals and targets, some records may be put forward. It appears that the program presented is not focused to achieve certain targets, but rather on the implementation and development of programs that already exist. This can be happened because the targets have not been clearly presented to guide a particular program.

When considered as a whole, the sequence of presentation of the achievements of sports development strategy typically begins with existing conditions at this time, followed by analysis, then the target to be achieved, and how to achieve those goals. Many organization define their strategic alternatives in terms of grand strategy. An organization's grand strategy provides direction by defining a strategic approach to business. The grand strategy formulation process is carried out in four stages (1) strategic analysis which is addresses the question, "What is the current position of the organization?" (2) strategy formulation answers the question, "Where does the organization want to be?" (3) strategy implementation answers the question, "How can the organization get to where it want to be?" and the final stage is (4) strategy control, answers the question, "How will the organization know when it has arrived?" (nn, 2014).

Referring to the definition of grand strategy, after presenting the current state of sports achievements and accomplishments of sports development program, and with the analysis of internal strengths and weaknesses and external opportunities and challenges, GSPOP 2014 - 2024 should present the vision, mission, organizational goals to be achieved, as well as work programs as a means to achieve the stated goals. The target has been set, but the target is not derived from the analysis of the conditions described in the achievement of the document, but an excerpt from the target set by Kemenpora. Therefore, the target is less specific, intended for which stakeholders? or will be achieved by which program?

Strategy of development of sports achievement has also been established, but these programs have not specifically mention the period of implementation and which targets would be achieved by the program. Although the program inside the grand strategy is still global, and more accommodative to the existing programs, but the presentation needs to be preceded or complemented by rational why the program needs to be carried out or continued. However, KONI has made a good breakthrough by proposing the existence of coordinating agency to organize the construction of sport achievement that involves many stakeholders.

Ways for implementation of the program has been presented in GSPOP 2014 - 2024, but still a framework outline so it will be difficult for the implementers in the field to carry it out. Even if GSPOP 2014 - 2024 is considered as a macro policy, it is still necessary for the implementation mezzo policy, and micro policy as elaboration. That is, the implementation GSPOP 2014 - 2024 still require guidelines or SOPs that govern those responsible, the implementation, how much money needed, when to finish.

Control programs have been presented on pages 68-69, but as a way of implementation, monitoring and evaluation procedures is only a brief description along three short paragraphs. Therefore, program control procedures still need to be specified by providing monitoring and evaluation mechanisms, and reporting, as well as who will be responsible, whether institutionally or individually held.

### **3. The Impact of Policy**

Looking at the formulation the target program, which is not explicitly mentioned for whom these goals are formulated, or who is responsible for the achievement of these targets, it will be difficult to measure the effectiveness and efficiency program initiated, when compared with the formulation of the set target. The impact is the origin of the program's success and the failure of the target will be difficult to be traced. This document may affect the achievement of sports development in Indonesia when all stakeholders understand the role and functions of the authority, as well as coordinating agencies that have no strong authority to regulate the implementation of the defined program.

Achievement of the objectives of national sport development, the point is as a vehicle for improving the dignity, and the dignity of the nation, in the arena of international affairs. However, in practice show that, on achievement of certain sporting event is more instant, and shortcuts. This suggests the existence of inconsistencies between defined policy and practice in the field of coaching. That said, the practice of buying and selling or hijack athletes between regions, rather rampant ahead of the implementation PON, though, is starting to be controlled by strict regulations, and without mercy. This condition is certainly not conducive to fostering athletic performance, for the national interest. Problem of the inability of the government in the provision of facilities, sports and educational infrastructure evenly not only be the cause of inter-regional disparities, but also result in lower interest of the community for sports.

Considering that the development of national sport achievement is an integral part of the overall national development, all stakeholders must join hands, work together to jointly strive, each according to their ability to participate actively in the development of sport. Hopefully sport achievement in Indonesia is able to raise the dignity of the Indonesian people.

## CONCLUSION

Taking into account the results of the above analysis, GSPOPON 2014 - 2024 is adequate and sufficient to meet the requirements as a public policy document, but GSPOPON 2014 - 2024 have yet to be effectively implemented in the field because the document still requires legal protection from the government, and the clarity which is to become a leading institution sectors in its implementation.

As a strategic planning document, GSPOPON 2014 - 2024 already has a target set, but the foundation the results of the analysis of the strengths and weaknesses of internal and external challenges and opportunities have not been fully presented, although the program is general, but it would be better if equipped with the period of the implementation. GSPOPON 2014 - 2024 is still need to be equipped with SOP or guidelines for program implementation and control of the implementation of the program. By complementing the existing shortcomings, we hope that GSPOPON 2014 - 2024 can be a guideline for all sport society in promoting a national sport achievements.

## REFERENCES

- \_\_\_\_\_. "Chapter 5 Strategic planning in a global environment". Diunduh tanggal 24 Maret 2014 dari [www.210.46.97.180/zonghe/book/112-pamela s. Lewis sthepen h. Goodman particia m. Fandt/5.htm](http://www.210.46.97.180/zonghe/book/112-pamela%20s.%20Lewis%20sthepen%20h.%20Goodman%20particia%20m.%20Fandt/5.htm).
- Biro Humas dan Hukum Kemenpora RI. Undang-undang Republik Indonesia nomor 3 tahun 2005 tentang Sistem Keolahragaan Nasional.2007.
- Daft. "Chapter 8 Strategy formulation and implementation". Diunduh tanggal 23 Maret 2014 dari [www.swlearning.com/ibc/daft6e/pdf/Daft\\_ch08.pdf](http://www.swlearning.com/ibc/daft6e/pdf/Daft_ch08.pdf). 2014.
- Hykurniawan.** "Analisis kebijakan publik." Diunduh tanggal 14 Desember 2008 dari <http://hykurniawan.wordpress.com/2008/09/17/analisis-kebijakan-publik/>. 2008.
- KONI. (2013). *Grand strategi pembangunan olahraga prestasi nasional 2014 – 2024*.
- Nugroho, Riant. (2008). *Kebijakanpendidikan yang unggul*. Yogyakarta: PustakaPelajar.
- Nugroho, Riant. (2011). *Public policy: Dinamika kebijakan-analisis kebijakan-manajemen kebijakan*. Jakarta: PT Elex Media Komputindo.
- Widodo, Joko. (2008). *Analisis kebijakan publik: Konsep dan aplikasi analisis proses kebijakan publik*. Malang: Bayumedia Publishing.

# **“NO PRACTICE, WATCH ONLY”: SPORT IN CONSUMER SOCIETY**

**Anirotul Qoriah**

Semarang State University, Indonesia

anirohws@yahoo.co.id

## **Abstract**

Consumer society is a society in which the buying and selling goods and services is the most important social and economic society. Sport as recreational activity and commercial spectacle becomes one central in capitalist era. It produces money for corporations in the field, but problems for the consumer of sport, such as sport gambling/ betting, hooliganism, spectator rivalry and mass riot, and people who do only enjoy watching sport for amusement, but do not practice it for health. Combining theory from psychology and sociology on consumer culture and consumer society, I'll address the issue in regard to shed light on how this issue arises and how to treat it. Better understanding about why people do and do not exercise is important for intervention effort. The problem is actually complex, involving many factors: individual, social, and environmental. Some people do not exercise just because they are extrinsically motivated, some other because they see sport as means for amusement, and the rest because of some constraints. To drag people to participate, they need to be help to overcome perceived constraints first. Second, they need to be conditioned through regulation and rewarding social sport activities. Third, they need to be made aware of their own physical condition and health to bring out intrinsic motivation participating in sport.

**Key words:** sport, consumer society

## **INTRODUCTION**

AIA Healthy Living Index Survey shows that Indonesia places in the lowest rank among 15 countries in Asia-Pacific region on healthy living index. The survey indicates that even though there is an increasing number of adult that exercise regularly since 2011, Indonesian people prefer passive activity to release stress. Passive activities such as watching television or movies for having fun instead of doing exercise are known as threat toward health [1].

Another study held by University of Worcester, England, also found same result regarding passive activity playing computer or online game and watching television. Now day, there are more children who less active by doing active activity such as playing in the ground (less than 60 minutes for exercising or play outside). This habit may harm physical health in their future life [2].

As way for having fun, passive activity may be categorized as an amusement. Doing passive activity, people obtain excitement or enjoyment with minimum effort by watching other people's activity [3]. It is detrimental for health because people don't do much physical work or exercise. Active play is important for physical development and can become means to discharge tension, stress, and negative emotion.

Tendency toward passive activity may be understood as a social phenomenon in modern age where consumerism is pervasive. Science and technology make almost everything easy, including having fun. Through television and gadget people can experience amusement. They can watch football match and sport competition at home. They can play sport game in their gadget or personal computer, offline and online. They can be spectator for local football team

and join every match as supporter. They do enjoy sport, but only as sport lovers. They only watch, but no practice.

Being healthy is impossible to achieve if people only enjoy watching sport. To be a habit, sport and exercise should be practiced as means to be healthy, to release stress, and to have fun individually or socially together with friends or family. To understand this problem, I do theoretical study in the field of sport psychology, sociology of sport, and sport science. My aim is to give some suggestion about how to increase sport and exercise participation in modern society.

## **SPORT IN CONSUMER SOCIETY**

Many Indonesian are willing to spend money to support their favorite sport team. They buy accessories depicting their favorite team, watching match lively in the stadium, or set up agenda to watch sport match together, or “nontonbareng”. Especially for football, Indonesian can be considered as fanatic. Indonesia has ranked in third position of country with greatest number of supporter in the world (Germany is the second and Brazil is the first). The problem persists, since people prefer sport as just an amusement to be enjoyed and supported, not activity to be exercised. If we want to create a healthy society, this tendency should be cured [4]. But, why does that tendency occur?

### **Consumer Culture**

Consumer society is about consumer culture. First, from economic perspective, consumer culture is premised upon the expansion of capitalist commodity production which has given rise to a vast accumulation of material culture in the form of consumer goods and sites for purchase and consumption. This has resulted in the growing salience of leisure and consumption activities. Second, in sociological view, the satisfaction derived from goods relates to their socially structured access in which satisfaction and status depend on displaying and sustaining difference. Third, psychologically, there is emotional pleasure of consumption, the dreams and desires which become celebrated, direct bodily excitement, and aesthetic pleasure [5].

Consumer culture emphasizes that the world of goods and their principles of structuration are central to the understanding of contemporary society. This involves a dual focus: first, on the cultural dimension of economy, the symbolization and use of material goods as “communicators” not just utilities; and second, the economy of cultural goods, the market principles of supply, demand, capital accumulation, competition, and monopolization which operate within the sphere of lifestyle, cultural goods, and commodities [5].

The concern with lifestyle suggests that the practices of consumption, the planning, purchase, and display of consumer goods and experience in everyday life cannot be understood merely via conceptions of exchange value and instrumental rational calculation. It tends to be hedonistic and emotional economy. The modern individual within consumer culture is made conscious that he speaks not only with his clothes, but with his home, furnishings, car, and other activities which are to be read and classified in terms of the presence and absence of taste [5].

### *Sport in Consumer Society*

Sport can be seen as central to the ‘economies of signs and space’. Sport and sporting bodies are commercialized and commodified progressively. Like the premise of consumer culture, sport makes body as a means of self-expression [6]. People build their body through gymnastic and fitness, for example. They want their body communicate that they have ideal shape and gain recognition from other who see them and praise, “You have good body. What do you do?”

Sport becomes one massive industry or business. There is increasing number of jobs in sport and recreational activities. Sport in consumer society is also focused on fandom and fans, advertising, individual athletes, teams, or mega sport events [6]. There are many football fans (consumer) that keep consuming their favorite team accessories even if the team is unsuccessful

or the price is high for the sake of commitment, or even if that team is come from foreign country and their match can only be seen forever through television (!) Individual athletes become celebrity and show in media to endorse products. Whatever they wear or hair style becomes trend among their fans. There are entrepreneurs that will invest much money into commercial teams in pursuit of sport success. They dare to pay high for good players and coaches. Many countries competes each other to be chosen as host of mega sport events such as World Cup Football Competition and Olympic Games. They build more stadiums, sport arenas, and venues for the occasion.

People spend much money for sport that they do not do and try to get profit from that. One problem arises internationally: sport gambling or sport betting. Sport gambling/betting is now online and pervasive, but it becomes industry. In United States, scholars said that gambling as “the deadliest sin in sports.” “Nothing has done more to despoil the games Americans play and watch than widespread gambling on them. As fans cheer their bets rather than their favorite teams, dark clouds of cynicism and suspicion hang over games, and possibility of fixes is always in the air.” It corrupts the integrity of sport [7].

It is a crime in many countries. In Indonesia, it becomes legal, social, and moral problem as Social Affairs Ministry of Republic Indonesia states [8]. A qualitative research conducted by RianPambudi [9] shows that there are some motives for sport betting “judi bola”. There is a view that sport betting is just an amusement and profitable. But, its consequences are not simple. Addiction is serious psychological problem related to sport gambling. Physically, watching match until late night or all night is detrimental for health. In the morning, work and study become not optimal. If the bet is lost, it will be a great loss.

### **Theoretical Approaches to Sport Consumption in Consumer Culture**

There have been three main approaches to understanding consumption and consumer culture: the production of consumption approach, the modes of consumption approach and the pleasures of consumption approach [6].

First, the production of consumption approach. In the view of Adorno and Horkheimer, sport becomes part of culture that turns into item to be sold in capitalist market place, and thus it came to be just like any other industry. In developed consumer capitalism ‘wants’ (desires) were turned into ‘needs’ (essentials), thus suggesting a shift from the ‘authentic’ to the ‘inauthentic’. The ‘triumph of advertising’ in the culture industry is secured since ‘consumers feel compelled to buy and use its products even though they see through them’ [6].

Second, the modes of consumption approach. In the view of De Certeau and Fiske, consumption becomes a means of personal empowerment, subversion or resistance, that is, it is mediated by active consumers/audiences. Sport becomes practices of everyday life to maintain, strengthen and challenge social and cultural boundaries associated with class, gender, race and age. People use consumption to create identities, social bonds and distinctions or social distance; to display and sustain differences; and to open or close off opportunities for selves and others [6].

Sport has several functions in regard to modes of consumption approach [6]. First, socially sport functions as horizontal differentiation – within social classes and groups – and vertical social division – between social classes and groups. Now days, a democratization of taste was occurring that permitted wider access for most of the population to previously exclusive consumption activities. Now people from different social class and group may enjoy almost all various kinds of sport, for example, football, basketball, swimming, jogging, bicycling, gymnastics, badminton, mount climbing, etc. However, there still are sports that exclusive to certain (high) social class, such like golf, horse riding, skiing and snowboarding, polo, ice skating, and sailing.

Second, personally sport consumption behavior considered to be becoming more individualised so that lifestyles could no longer be associated with specific social groups. A person may have special and unique preferences toward sport concerning his/her circumstances, interest, or culture. A woman to protect herself may train for self-defense. Because of work



requirement, a man may train for body-building and practice lifting everyday. For health, an old man may do gymnastic for elderly or a pregnant woman may do pregnancy exercise. Or just for hobby, a teenage boy practices karate. People from urban community may go to fitness center to exercise. But, people from rural area may just go jogging or walking in their neighbor area.

The last approach is pleasure of consumption in the view of Benjamin. It concerns with dreams, images, and pleasures. In consumer culture there may be a dialectical relationship – between false consciousness and the sources of collective energy and inspiration to overcome that same false consciousness. People look for the utopian moments locked into commodity relations; sensation, the strange, exotic, and spectacular. They do sport as it facilitates rebellion, or at least a channel for ‘escape attempts’, from everyday life [6]. This approach explains those who do extreme sport like bungee jumping, illegal motor racing, rocks climbing without safety tool, and any other action or adventure sports.

## **UNDERSTANDING FANDOM: SPORT PARTICIPANT AND SPORT SPECTATOR**

Fan is defined as an enthusiastic admirer of a sport, hobby or well-known person. Fandom is about all things related to fans of that sport, an activity, or a famous person. Fandom is both a public and private experience (from online English dictionary). Fandom is different from spectatorship. Wannet al describe the differences between a fan and a spectator in the degree of devotion to the team or a player. A sport fan is individuals who are interested in and follow a sport, team, and/or athlete. Sport spectators are those individuals who actively witness a sporting event in person or through some form of media (radio, television, internet, etc.) [11].

Jacobson described that a fan identity, as with any group identity, is beneficial to the individual in that it may provide a sense of community. Fandom benefits development of diverse interests, the minimal skill level necessary for participation, and the low cost. Fandom brings activities, such as football, to more sectors of society, including the very young, the very old, the ill, and those who simply lack the necessary athletic ability required for participation. Fandom allows individuals to be a part of the game without requiring any special skills. Fandom offers social benefits as feelings of camaraderie, community and solidarity, as well as enhanced social prestige and self-esteem [11]. But, fandom is not always perceived as positive. Fans as a merely spectator, are criticized for their apparent lack of physical fitness as well as for being passive or lazy. There is a high level of violence among fans including, but not limited to hooliganism and riotous victory celebrations [11, 12].

Spectatorship is not active sport participation, therefore it lack some physical benefits and health of doing active sport. According to Dumazedier, participation in sports has three functions: 1) relaxation, which relieves the fatigue caused by the activities of daily life; 2) recreation, which relieves the boredom of daily life, and 3) free development, which provides relief from specialization. Participation in sport is said may: 1) promote physical fitness and health, 2) produce mental benefits of fitness, 3) help to control aggressive behavior, 4) have recreational value (relaxes tension, relief from boredom, and provides free personal development); 5) teach a sense of fairness, and 6) serve the control of disapproved impulsive emotional behavior [13].

The spectator is a person who just watches, but does nothing to participate in sport. Many benefit of active participation may be unattainable through spectatorship. Doing nothing but watching, spectatorship is seen as useless activity, a waste of time, and sometimes they misbehave and cause trouble in public place. But, spectatorship is not always bad if it's reconsidered as a means of catharsis to discharge aggressive impulses. Even though it may not work for competitive and rough sport, spectatorship of recreational sport has relative same benefit with participative sport. By watching, it relieves from boredom, relaxes tension, and provides development [13].

Recreation through spectatorship permits the development of diverse interest. It comes at a low cost in effort, and it requires minimal skills. It is accessible to those who to poorly in active participation in sport, to those who are weak and ill, or too old. It has solidarity-

enhancing function. It can teach people about fairness and social solidarity. Apprehensions about a contest can be shared a million fold. Spectatorship expands sport as social experience and creates new social phenomenon. A game can be “talk everywhere”; can be “talk of the town” [13].

## WHY DO PEOPLE EXERCISE AND NOT EXERCISE?

In previous section, I show that people involved in sport can be classified into three groups, namely: 1) fan of sport, those who have strong devotion toward sport, are interested in and follow a sport, team, and/or athlete, 2) spectator of sport, those who witness a sporting event in person or through some form of media, and 3) participant of sport, those who actively exercise. I further classify that a fan can be either a mere spectator or participant of sport. They have potential to be passive and active on sport.

There are some explanations about why people who like sport do (being participant) and not do exercise (being spectator). The factors that influence fandom and the inclination to exercise are:

### *Motivation*

Man and woman fan of sport team has differences regarding their motive. The reasons for being a fan of a women's sport are different than the reasons for being a fan of the same sport played by men. Females and males were not equally likely to be sport fans, in general or for a specific team. In context of basketball, male participants' ratings as fans of sport in general and fans of specific teams, and overall ratings on the sport consumption motives were higher than women. Males appreciated the beauty and gracefulness in basketball for men's and women's games, while females found women's basketball more aesthetically appealing [14].

Wann et al [15] examined sport type differences in eight fan motives: escape, economic (i.e., gambling), eustress (i.e., positive arousal), self-esteem, group affiliation, entertainment, family, and aesthetics, on 13 target sports: professional baseball, college football, professional football, figure skating, gymnastics, professional hockey, boxing, auto racing, tennis, professional basketball, college basketball, professional wrestling, and golf. Those sports were classified into three different dichotomies: individual (e.g., figure skating, golf) versus team (e.g., professional baseball, college basketball); aggressive (e.g., professional wrestling, professional football) versus nonaggressive (e.g., professional baseball, figure skating); and stylistic (e.g., figure skating, gymnastics) versus nonstylistic (e.g., professional hockey, tennis).

Wann et al found that aesthetic motivation was particularly prominent in individual sports, while scores were greater for team sports in eustress, self-esteem, group affiliation, entertainment, and family. Aesthetic motivation scores were also high in nonaggressive sports, while economic, eustress, group affiliation, and entertainment were higher for team sports. Finally, aesthetic motivation was quite high for stylistic sports, while economic, eustress, self-esteem, group affiliation, entertainment, and family motivation scores were higher for nonstylistic sports. Only one motive, escape, was not found to differ in at least one sport type comparison [15].

### *Value*

Human behavior in regard of sport can be explained by understanding the values behind it. In psychology, human value is vastly investigated and the most notable research may be the work of Rokeach. He claims that values guide actions, attitudes, and judgments. According to Beatty et al [16], sport fan may endorse different value, described as follow:

**Table 1. Sport Consumption Differences According to Values**

No.	Value	Sport Consumption
1.	Sense of Belonging	Engage in competitive sports more, bicycle more,

		watching sporting events more than engage in them, prefer group activities Demographic: older and less educated
2.	Fun & Enjoyment	Jog more, prefer group sports, team and individual competitive sports more, dance, bicycle, backpack and camp more, attend more sports events Demographic: younger
3.	Being Well-Respected	Walk, bicycle, backpack, and camp less, have less hobbies Demographic: have larger income
4.	Excitement	Jog more, prefer group sports, team and individual competitive sports more, engage in sports events more than watching them, bicycle, backpack, camp, golf, and swim more Demographic: younger
5.	Security	Prefer to watch rather than engage in sporting events, prefer group sports and team competitive sports less, jog, dance, bicycle, and attend sporting events less but have more hobbies and hunt or fish more
6.	Self-Respect	Prefer group sports less

## DRAG PEOPLE FROM BEING PASSIVE TO ACTIVE

It's worrisome knowing Indonesia score lowest in healthy living index [1]. Passivity is time bomb from future generation. It keeps potential of many health problems and hamper physical development. But, being passive doesn't mean that people do not involve in sport. People actually have different fashion to get involved in sport. Moreover, in this modern era, consumerism makes people inevitably get involved in sport, especially through economic activity.

In consumer culture, sport and sporting bodies or athletes are commercialized and commodified progressively. Sport becomes one massive industry or business. Capitalists work through fandom and fans, advertising, individual athletes, teams, or mega sport events. People, willingly or not, are dragged to see sport and media makes sport everyday news in television, radio, newspaper, or online sites. Sport is everywhere; in billboard roadside, in television commercial breaks, and products that have no direct relation to sport like book note, school stuff, and snack packs. An old man who never watches Lionel Messi knows him as a football player through advertisement in media.

There are many attractive aspect of sport in the media. It draw people to stop, to give attention, to watch carefully, to follow everywhere the ball rolls, to yell in delight for the goals, and to get amused by the match. Unconsciously people have become its spectator. But, to be more fanatic spectator or active participant, that dynamic is not sufficient. First, they need to be motivated.

In psychology literature, motivation in sport usually has been discussed in term of participation sport and achievement sport [17]. According to Self-Determination Theory, there are three primary psychological needs that motivate person to participate in sport, namely: autonomy, competence, and relatedness. Those needs are considered as intrinsic motivation, with which people experience choicefulness in their behavior. This motivation is associated with feelings of satisfaction, enjoyment, competence, and the desire to persist at the activity. When people participate in sport by social pressure or for reward, status or approval, it means they are motivated extrinsically.

So, there are two kind of sport participation: intrinsic participation and extrinsic participation. At one time, a person may participate to sport because he/she like those activity

(intrinsic motivation), but at another time, he/she may get bored and need friend to accompany him/her to exercise (extrinsic motivation).

For persons who unmotivated to sport, the problem may be lack of intrinsic motivation. They need to be rewarded to exercise, or need to be pressured by other. They need to be educated first, why exercising is important and beneficial. To become habit, they need to be monitored, invited, and motivated continuously. In community, such effort exists in form of social event like “JalanSehat” with many prizes, seasonal sport competition, gymnastic exercise every Friday morning in schools and offices, etc. They enjoy sport not only to be healthy, but to have interaction with friends or colleague.

Sport as social regular event is different with sport as individual or group interest. The persons involved may be considered just fan of certain football club or fan of certain individual athlete. Sometime they go to see live match or gather together with friends to enjoy match in television; “NontonBareng” and become spectator. They indeed just watch and do passive activity, but it cannot be considered as bad. Concerning with theory of fan motives [15], they may gather together to escape from daily routine, to attain positive feeling, and to affiliate with group. Sport thus becomes means to recreate; recreational activity, for sense of belonging, fun and enjoyment, and excitement [16]. At this occasion they may seem passive, but outside this moment in school, academy, office, and community, they will do exercise to conform to social.

But, besides those, there are still people who do not exercise. The problem is not motivation, but several constraints that they perceived [10]. According to Jackson, constraints are factors perceived or experienced by individuals that limit the formation of leisure preferences and inhibit or prohibit participation in leisure activities. They are: lack of accessibility, lack of facilitations, lack of financial means, lack of interest, lack of partner/friend, lack of prior knowledge, safety and security, and lack of time.

Lepisto and Hannaford identified five types of barrier [10]: 1) marketing constraint, failed fit between product and consumer, 2) cultural constraint, prevailing cultural norms and values that might restrain behavior, 3) social constraint, influence of reference groups and social expectations on actions, 4) personal constraint, individual lifestyle or pattern of living, and 5) structural constraint, restriction of behavior due to certain physical, temporal, or spatial challenges.

In order for people willing to exercise, they must be helped to overcome those constraints by negotiating that negative factors. There may be several social norms and values that are unfavorable for exercise activity, like woman should not go outside, or doing this and that is taboo. In home, there may be family member who does not like sport, thus they become model for youth to not exercise. As personal, an individual may be too busy of works, so that they have no time to leisure activity. In environment, there may be lack of sport facilitation; no park, no football field, no swimming pool, etc. Overcoming those constraints are prerequisite for people to exercise.

## CONCLUSION

“No practice, watch only” actually is not a simple matter. There are several reasons why people do only watch and those are not laziness or lack of knowledge about the benefit of sport and exercise: 1) they are unmotivated intrinsically and need extrinsic reward and social pressure before do exercise, 2) they do not see the function of sport as only physical activity for maintain health, but as recreational activity to socialize, to reduce stress, to have fun, and 3) they are constrained by many things culturally, socially, personally, and structurally. Because of those factors some people are only able to be a fan or a spectator, not a participant.

To drag people to participate, first, they need to be helped to overcome perceived constraints in environment, neighborhood, family, and their own selves. Second, they need to be conditioned through regulation and rewarding social sport activities in community, like “JalanSehat”, Friday gymnastic exercise, etc. Third, they need to be made aware of their own physical condition and health to bring out intrinsic motivation participating in sport. This could

be done through physical and health education activities. There should be a shifting from being just fan in the first place, then spectator, and in the end, participant.

In consumer society, sport has lost its primary function. People use sport as they wish to create. Capitalists may use sport as “money machine”. Anything about sport can be sold: match, sport team, individual athlete, the stadium, tour to the field and watch athletes’ training, accessories, and sport events. Fandom creates athlete celebrities, and those celebrities come out in media to endorse commercial products or invite people to do charity for humanity.

Fans as consumer have several reasons too to keep becoming fan. In quite negative view, fan is person who irrationally cheats him/herself when the only “desire or wants” is perceived as “needs”. They keep consuming even though they know that they do not need it. Other view said that consuming sport has social and individual function. There are sports to maintain identity belonged to certain social class or group, there are sports to empower self, so people has their own unique sport preferences. The last view said that sport as channel of self-expression, to facilitate aggressiveness and rebellion in positive way.

## REFERENCES

- [1] AIA Group. *Healthy Living Index Survey 2013*. Retrieved from:  
[http://www.aia.com/en/resources/895afc80423d270aa2b4ea0f2cbf0f90/Siaran\\_Pers\\_AIA\\_HEALTHY\\_LIVING\\_INDEX\\_SURVEY\\_2013.pdf](http://www.aia.com/en/resources/895afc80423d270aa2b4ea0f2cbf0f90/Siaran_Pers_AIA_HEALTHY_LIVING_INDEX_SURVEY_2013.pdf).
- [2] AndaNurlaila&Lutfi D. P. Astuti. *Studi: Anak Masa Kini Lebih Pasif*. VIVAnews, 5 Juli 2011.  
<http://life.viva.co.id/news/read/231128-studi--anak-masa-kini-lebih-pasif>.
- [3] Hurlock, E. B. (1978). *Perkembangan Anak Jilid 1*. Jakarta: Erlangga.
- [4] *Memasyarakatkan Olahraga dan Mengolahragakan Masyarakat*. <http://m.bolanews.com/blog-read/ajang-blogging/106-Memasyarakatkan-Olahraga-dan-Mengolahragakan-Masyarakat.html>.
- [5] Featherstone, M. (2007). *Consumer Culture and Postmodernism. Second Edition*. Los Angeles: SAGE Publications, h. 13.
- [6] Horne, J. (2006). *Sport in Consumer Culture*. New York: Palgrave Macmillan.
- [7] Rodenberg, R. M. & Kaburakis, A. (2012). Legal and Corruption Issues in Sports Gambling. *Journal of Legal Aspects of Sport*, Vol. 23, pp. 8-35.
- [8] Agung Wuryanto. (2012). *Judi Online, permasalahan dan Solusi*. <http://www.kemsos.go.id/modules.php?name=News&file=article&sid=17159>
- [9] Rian Pambudi. (no year). *Perilaku Mahasiswa Fisip yang Melakukan Judi Bola Online*. <http://journal.unair.ac.id/filerPDF/Rian%20Pambudi%20Wibowo.doc>.
- [10] Funk, D. C. (2008). *Consumer Behaviour in Sport and Events: Marketing Action*. Burlington, MA: Elsevier, Ltd.
- [11] Jacobson, B. (2003). The social psychology of the creation of a sports fan identity: A theoretical review of the literature. *Athletic Insight: The Online Journal of Sport Psychology*. 5, 1-14. <http://www.athleticinsight.com/Vol5Iss2/FanDevelopment.htm>.
- [12] Gow, P. & Rookwood, J. (2008). Doing it for the team—examining the causes of hooliganism in English football. *Journal of Qualitative Research in Sports Studies*, 2(1), 71-82.  
[http://www.writtenow.ac.uk/oldsite/QRSS/vol\\_2/Paper%206%20Gow%20and%20Rookwood%20Vol%202%202009.pdf](http://www.writtenow.ac.uk/oldsite/QRSS/vol_2/Paper%206%20Gow%20and%20Rookwood%20Vol%202%202009.pdf).
- [13] Zillmann, D., Bryant, J., & Sapolsky, B. S. (1989). Enjoyment from Sports Spectatorship. In J. H. Goldstein. *Sports, Games, and Play: Social and Psychological Viewpoints*. New York: Psychology Press.

- [14] James, J. D. & Ridinger, L. L. (2002). Female and Male Sport Fans: A Comparison of Sport Consumption Motives. *Journal of Sport Behavior*, 25(3), 260-278.
- [15] Wann, D. L., Grieve, F. G., Zapalac, R. K., & Pease, D. G. (2008). Motivational Profiles of Sport Fans of Different Sports. *Sport Marketing Quarterly*. 2008, Vol. 17 Issue 1, p6-19. 14p.
- [16] Beatty, S. E., Kahle, L. R., Homer, P., & Misra, S. (1985). Alternative Measurement Approaches to Consumer Values: The List of Values and the Rokeach Values Survey. *Psychology & Marketing*. Vol. 2 (Fall), 181-200. [http://www.csulb.edu/~pamela/pubs/Consumer\\_Values.pdf](http://www.csulb.edu/~pamela/pubs/Consumer_Values.pdf).
- [17] Frederick-Recascina, C. M. (2002). Self-Determination Theory and Participation Motivation Research in the Sport and Exercise Domain. In E. D. Deci & R. M. Ryan. *Handbook of Self-Determination Research*. Rochester, NY: The University of Rochester Press.

# THE FIELD OF LECTURERS EXPERTISE BASED ON SPORT SCIENCE DEVELOPMENT

**Bambang Priyonoadi<sup>1</sup>, Saryono<sup>2</sup>, and Soni Nopembri<sup>3</sup>**

Faculty of Sport Science, State University of Yogyakarta

## Abstract

This research is motivated by not clearly identified areas of lecturer expertise at the Faculty of Sport Science Yogyakarta State University based on the sport science development. Therefore, research needs to be done to get an idea of the field of lecturer expertise distribution at the Faculty of Sport Science Yogyakarta State University in the context of the sport science development. The study is descriptive quantitative research. The data source was taken from various documents totaling 106 lecturers of Faculty of Sport Science Yogyakarta State University scattered in Sports Education Major, Coaching Education Majors, and Health and Recreation Education Majors. Data collection techniques by documents tracing (documentation) related to lecturers expertise on the employment office, such as: certificate of Employment and Occupation, Certificate Degree, Certificate of Teaching/learning, and others. This research uses documentation sheet as an instrument to help researcher's data collecting. Data analysis is used percentage techniques. The results of this study illustrate that lecturers expertise of faculty of sport science Yogyakarta State University scattered in the main theoretical dimensions of sport science as many as 76 people (72 %), a specific theoretical field of sport science as many as 11 people (10 %), the field theoretical emerging of sport science as one person (0.9 %), and sports discipline (sports branch) as many as 18 people (17 %). These results imply that the lecturers who have expertise in the field of main theoretical dimensions, theoretical emerging field and the field of sports disciplines aligned to be more specific field studies to provide maximum contribution to the development of sport science.

**Keywords:** expertise, lecturers, science, sports.

## INTRODUCTION

University is the highest education unit in knowledge development. In fact university is educated society ( including lecturers, students and technical employees in college area) that have tasks to advance man's prestige and cultures by research, learning and service, that could be given to local society, national, regional and international (F. Soesianto, 2013). According to that fact, learning and dedication to people is known as "Tri Dharma" of Higher Education.

Yogyakarta State University (YSU) that owns faculty of sports science is unique, because only few numbers of universities have sports field. The development of dynamic sports is one of the challenges to Faculty of Sport Science which is part of Yogyakarta State University (YSU). The development of sports science as an acknowledged knowledge is not easy. Existence of knowledge depends on sensitive investigation the lecturers do.

The numbers of lecturers in faculty of Sport Science are 106 that divided into 3 majors. The majors have different characteristic, they are Sports Education Major, Coaching Education Majors, and Health and Recreation Education Majors. Lecturers with various skills have important role to support each majors. This situation causes sports as specific knowledge so that each lecturer able to develop anything about body and sport education as an interesting knowledge. However, the development that happens about sports profession association and supporting knowledge in sports field are very complex and specific. The complexity and specification itself are going to be an interesting knowledge about necessity of lecturer's mapping to classify specification.

According to national sports policy by National Sport System of Laws declares that sports consist of 3 sections; sport or body education; achievement sport; recreation sport. On the other hand, tree of sports becomes the base starting point of division of sport expertise. From that policy lines support of specific sport knowledge have important role. Development of sport knowledge in Indonesia is related to the western education. It is because originally the knowledge is taken from western culture that has been spread to Indonesia. Dynamic and great development can make sport knowledge interesting to discuss. Some established sport fields like medical sport, pedagogy sport, psychology sport are some specific expertise fields.

To adopt knowledge that is made as foundation to map lecturer's expertise, FIK UNY needs to be examined to know how deep lecturers' expertise according to their works and publication they have done. This lecturers mapping becomes one of the main key for the development of FIK UNY which are directed and will be useful toward lecturers' placement system in teaching, doing research and dedication to people. Therefore, it is needed to do a research which able to see the lecturers' interest toward developing specific sports knowledge so it can be seen the gradation of knowledge they have. According to that, so it is needed to do a research which describes lecturers' expertise of FIK UNY according to sport knowledge development.

## **LITERATURE REVIEW**

Lecturer as profession actually directed to efforts done by instructor as a realization from educators and students role in university (Yusuf Sayyid Mahmud, 2009). Therefore, development of lecturers' professionalism means large efforts to upgrade competence, learning quality and instructor academic role in university. Education experts declare several of opinions about this profession development program. According to J.G. Gaff and Doughty, quoted by Miarso, there are three efforts related to one another, they are instructional development (ID), organization development (OD), and professional development (PD). Bergquist and Philips said that lecturers' development is main part of institutional development, which covers part of personal development, professional development, organization development and people development. Meanwhile Nur Syam said, lecturers profession development covers four competences, they are: Pedagogical competence or lecturers' skill to manage learning, Personal competence or authority standard, maturity and leadership, Professional competence or lecturers' skill to master content and learning methodology, and Social competence or skill to do social communication to students or society.

Sport as a knowledge is being admitted and constructed formally in Indonesia is still new, that is since 1999 when High Education Department, National Education Department formed Sports Knowledge Discipline Commission as 13th Knowledge Discipline Commission, beside other 12 Knowledge Discipline Commission had constructed by Knowledge Consortium. Before Sports Knowledge Discipline Commission was formed, formally the existence belonging to Education Knowledge that was constructed by Education Knowledge Consortium (Sugiyanto, 2001). Result of sport knowledge had arranged in knowledge structure as one of academic discipline structure or knowledge discipline. With same material object and formal, it turns out to be made up knowledge structure and the knowledge discipline terminology leans to be different in every country (Sugiyanto, 2001).

Sports knowledge is basically the root of knowledge include multi dimension life and human life. Life and human life are always in birth dimension, growth, and death; physical dimension, mental, and emotion; biologic dimension, personal, and behavioural; individual and social dimension; time and space dimension; natural dimension, humanist, and cultural (Sugiyanto, 2001). Sports knowledge study about sport phenomenon, and the human who do it, Therefore sports knowledge has complex dimension along with human existence complexity. Sports Knowledge develops from predecessor knowledge that study about human and dimensions, by focusing to learn about human who do sports activity, the sports they do and anything with it. Sports knowledge is also known as systematic and organized knowledge about sports phenomenon that is formed by scientific research system. Knowledge discipline stands



alone actually Sports Knowledge can be supported by ontology study, epistemology, and class axiology and can be accountable. Anthology study is done to answer question about actual object in sports study which is considered unique and it is not learned in other knowledge discipline. Epistemology study is done to answer question about how the way and study system that is used to develop sports knowledge. Whereas axiology study is done to answer question about what is the real value which sports knowledge has given for human's benefit (Sugiyanto, 2001).

Study about sport body of knowledge, according to Herbert Haag concept in Sugiyanto (2001), can be identifies existence of 3 bodies of knowledge dimensions, they are: 1) theoretical dimension; 2) knowledge dimension; and 3) sport discipline dimension. Sport theoretical dimension covers: Sports Philosophy, Sports Biomechanics, and Medical Sports. Beside other 7 established theory fields, there are other more specific developing theories, they are: Motor Learning, Motor Development, Play Theory, Movement Theory, Training and Coaching Theory. The theories that is developing include: Sport management, Sport infrastructure, Sport Industry, Sport communication and mass media, Sport Economy, Sport Law, and Sport Politics.

## **RESEARCH METHOD**

This research is Quantitative Descriptive research by main data collecting documentation method. Descriptive research gives image of certain condition and indication. The image of condition that is mentioned is lecturers' skill field according to sport science development. Variable in this research is lecturers' skill field according to sport science development. Operationally this variable can be definite as a special skill which is owned by FIK lecturers in efforts to develop sport science discipline that is acquired with kinds of information by biographical data, promotion, and fields that they are particularly interested in. This research is a population research so that researchers use all research subjects. The subjects of this research are 106 FIK's lecturers which divided into three majors, they are: Sport Education Majors (POR), Coaching Education Majors (PKO), and Health and Recreation Education Majors (PKR). Instrument of this research are documents and biographical data related to education, occupation and grade data, skill fields, teaching, research and publication, and dedication to people (PPM). Data collecting technique is done with documents research in administration analysis section using data quantitative analysis with percentage.

## **RESEARCH RESULT**

### **Lecturers of FIK UNY's Expertise according to the Main Theoretical Dimensions of Sport Science**

According to table 1 above it can be concluded that 76 persons (72%) of FIK UNY's lecturers have expertise field include theoretical sport knowledge. POR has 25 persons or (51%) of POR's lecturers that expert in sport theoretical knowledge. PKL has 28 persons or (93%) of PKL's lecturers that expert in sport theoretical knowledge. PKR has 23 persons or (85%) of PKR's lecturers that expert in sport theoretical knowledge. Sport pedagogy theory field has highest percentage in POR majors (35% of POR's lecturers) and PKL majors (70% of PKL's lecturers). Sport Medical theory has the highest percentage in PKR (48% of PKR's lecturers).

**Table 1. Lecturers of FIK UNY's Expertise According to The Main Theoretical Dimensions of Sport Science**

		POR		PKL		PKR	
		F	%	f	%	f	%
the main theoretical dimensions of sport science	Sport Philosophy					1	4
	Sport History					1	4
	Sport Pedagogy	17	35	21	70	6	22
	Sport Psychology	1	2	1	3		
	Sport Sociology	2	4.1	1	3		
	Sport Biomechanics	1	2	2	7	2	7
	Sport Medical	4	8.2	3	10	13	48
		25	51	28	93	23	85

**Lecturers of FIK UNY's Expertise according to Specific Theoretical Field of Sport Science**

According to table 2 above, it can be concluded that 11 persons or (10%) FIK UNY's lecturers have expertise field include in specific sport science theory. POR majors have 6 lecturers or 12% of POR's lecturers with specific sport science theory field expertise. PKL majors have 2 lecturers or 7% of PKL's lecturers with specific sport science theory field expertise. PKR majors have 3 lecturers or 11% of PKR lecturers with specific sport science theory field expertise. In POR majors there are lecturers that have specific sport science theory field expertise in movement field, motor development, and play theory. In PKL major there are lecturers that have sport science theory field expertise in motor development and exercise theory. In PKR majors there are lecturers that have sport science theory field expertise in movement study and exercise theory.

**Table 2. Dissemination Lecturers of FIK UNY's expertise According to Specific Theoretical Field of Sport Science**

		POR		PKL		PKR	
		f	%	f	%	f	%
Specific Theoretical Field of Sport Science	Motor Learning	2	4.1			1	4
	Motor Development	2	4.1	1	3	1	4
	Play Theory	2	4.1				
	Movement Theory						
	Training and Coaching Theory			1	3	1	4
		6	12	2	7	3	11

**Lecturers of FIK UNY's Expertise According to The Field Theoretical Emerging of Sport Science**

**Table 3. Lecturers of FIK UNY's Expertise according to recently developing Sport Science Theory Field Dimension**

		POR		PKL		PKR	
		f	%	f	%	f	%
the field theoretical emerging of sport science	Sport management					1	4
	Sport infrastructure						
	Sport Industry						
	Sport Communication and Mass Media						
	Sport economy						
						1	4

According to table 3 above it can be concluded that 1 person or (0.9%) of FIK UNY's lecturers has recently developing sport science theory expertise. The lecturer in the PKR major is Sport management field expertise.

**Lecturers of FIK UNY's Expertise according to Sport Discipline Dimension (Sport branches)**

**Table 4. Lecturers of FIK UNY's Expertise are according to Sport Discipline Dimension.**

		POR		PKL		PKR	
		f	%	f	%	f	%
Sport Discipline Dimension (Sport Branches)	Badminton	1	2				
	Swim	2	4.1				
	Takraw	1	2				
	Gymnastic	3	6.1				
	Athletics	2	4.1				
	Table tennis	2	4.1				
	Volleyball	2	4.1				
	Soccer	3	6.1				
	Softball	1	2				
	Basketball	1	2				
		18	37				

According to table 4 above it can be concludes that 18 persons or (17%) FIK UNY's lecturers have expertise field include sport discipline dimension or sport branches. Those lecturers are in POR majors (37% of POR's lecturers). PKO and PKR majors do not have lecturers in Sport Discipline Dimension and sport branches.

## DISCUSSION

Result of the research shows that FIK UNY's lecturers have the expertise which is appropriate to the Sport Science development. Currently, FIK UNY owns 106 lecturers which is divided into three majors, they are: POL, PKL, and PKR. From 106 lecturers, 76 of them (72%) have skill in Sport Science Main Theory field Dimension, 11 lecturers (10%) have skill in Sport Science Specific Theory Dimension, 1 lecturer (0.9%) has skill in developing Sport Science Theory field Dimension, and 18 lecturers (17%) have skill in Sport Discipline dimension (Sport branches).

The result of the reach also shows that most of FIK UNY's lecturers have expertise in Sport Science Main Theory field Dimension. In this dimension most of POR and PKL lecturers have skill in Sport Pedagogy. This is because body education and exercise field have the basic of pedagogy in developing education subject. This means that body and exercise education have the same strong education circumstances so that lecture's expertise development in this field is needed to be done specifically according to each learning field. For example expertise field in body education is to develop body education curriculum, body education learning technology, body education model, etc. While expertise field in exercise are development exercise program, exercise method, etc.

There are FIK UNY's lecturers that have expertise in sport science specific theory field dimension, like motor study, motor development, play theory, and exercise theory. Expertise field development in specific theory dimension is really needed so that lecturers able to do specific tri dharma as well. In developing sport science theory field dimension, FIK UNY has a lecturer mainly in sport management field development. FIK UNY is expected to be forerunner to develop lecturer's expertise in developing theory dimension. It is really needed because development of sports is not only developing main knowledge but to be harmonized with the requirements of people so that the knowledge is getting wider and specific.

There are FIK UNY's lecturers who have expertise in sport discipline field dimension. According to Sugianto (2001:7), Sport discipline dimension covers kinds and branches of existed sports as: Athletic, Gymnastic, Martial arts, Swim and Fancy diving, Soccer, Basketball, Volleyball, Handball, Badminton, Table tennis, Tennis, etc. There are 49 sport achievement branches and many kinds of healthy sports, sports for disables, exploring nature sport, and traditional sports. This means that is permitted that lecturers have this kind of expertise dimension, however lecturers better to have more specific expertise so that it is easier to the lecturers to develop their expertise.

## CONCLUSION

Lecturers are human resources that have high demand value in academic area. This is because lecturers have very specific expertise or competence in certain field. Lecturers' professionalism development is started with special expertise field the lecturers' have. This Lecturers' professionalism development is very important to develop quality of universities in Indonesia. Development program that should get priority is lecturers' professionalism development as main element of university. FIK UNY's Lecturers' expertise development is needed to be done so that sport science field can be leant especially by each lecturer so though contribution toward university becomes more real. FIK UNY's lecturers' expertise development can be done in sport science main theory fields dimension, sport science specific theory fields, and developing sport science theory field. Expertise in sport discipline dimension is expected to be more specific in the knowledge field.

## REFERENCES

- [1] Komisi Disiplin Ilmu Keolahragaan. 2000. *Ilmu Keolahragaan dan Rencana Pengembangannya*. Jakarta: Dewan Pendidikan Tinggi, Ditjen. Dikti. Depdiknas.
- [2] Soesinato. 2013. *Hakikat Universitas*.  
[www.te.ugm.ac.id/~fsoes/.../Hakekat%20Universitas.d](http://www.te.ugm.ac.id/~fsoes/.../Hakekat%20Universitas.d). Downloaded in 17 Juli 2013.
- [3] Sugiyanto. 2001. *Dimensi Kajian Ilmu Keolahragaan (Sport Science)*. Prodi Ilmu Keolahragaan, Pascasarjana Universitas March eleventh.
- [4] Yusuf Sayyid Mahmud. 2009. *Tathwir al-Ta'lim al-Jami'iy*. Cairo: Dar al-Kitab al-Masry al-Lubnaniy.

# **CORRELATION OF NUTRITION STATUS AND DYSMENORRHEA PAINFUL TO FEMALE STUDENTS SPORTS SCIENCE DEPARTEMET FACULTY OF SPORT SCIENCE YOGYAKARTA STATE UNIVERSITY**

**Cerika Rismayanthi**

**Yogyakarta State University, Indonesia  
cerika@uny.ac.id**

## **Abstract**

Dysmenorrhea is a collection of symptoms of pain before and during menstruation. Generally, it happens to young girls who have the age ranged between 15-25 years. Nutrition and exercise are the factors that influence the emergence of dysmenorrhea. This study aims to analyze the relationship between nutritional status by index TB/U and the incidence of dysmenorrhea. One that affects dysmenorrhea is abnormal nutritional status and family history of dysmenorrhea. This research used mixed research methods because the retrieval and processing of data was done by two methods, both qualitative and quantitative. The data of nutritional status was collected by using the Body Mass Index (BMI), whereas dysmenorrhea complaint data by using questionnaires. The study population was the entire student Sports Science Departement totaling 30 people. Sampling used the population sampling methods. The analysis used quantitative analysis techniques and statistical methods. Nutritional status from female students of Sports Science Departement Yogyakarta State University is in a normal majority (70.0%). Of the 30 female students of Sports Study Yogyakarta State University; 13.3% had underweight nutritional status; 70.0% of normal; 16.7% overweight. The dysmenorrhea complaints of female students of Sports Science Departement Yogyakarta State University are at the level of 70.0% from the total. From the 30 female students of Sports Science Departement Yogyakarta State University, the complaint rate was 20.0% is in intermediate level; 70.0% complaint rate is in normal level; and 10.0% is in lower level. There was a significant negative relationship between the nutritional status and the dysmenorrhea complaint on female students of Sports Science Departement Yogyakarta State University in 2013. The better nutritional status, the lower the dysmenorrhea complaints on female students of Sports Study in 2013, and vice versa. Nutritional status is able to reduce the level of dysmenorrhea complaints on female students of Sports Science Departement Yogyakarta State University at 17.5%.

**Keywords:** Nutritional Status, Dysmenorrhea Painful, Female Students of Sports Science Departemen.

## **BACKGROUND**

Dysmenorrhea is defined as a great menstrual pain that forces people to take a break and leave their work for a few hours or a few days (Azzahra, 2009). Painful menstruation or dysmenorrhea occurs because of differences in the threshold of pain stimuli on everyone. Menstrual pain tends to occur more often and more severe, in adolescent girls who experience anxiety and tension. If it is not anticipated, these menstrual pains will often interfere with the activities of women (Qittun, 2008). Menstrual pain is one among the four menstrual abnormalities which are irregular menstrual cycle, menstrual bleeding more than 10 days old, the amount of blood clots, and lots of pain with menstruation. Generally, menstrual pain is not a single, but in combination with these disorders. The focus of attention is actually how low or high threshold of pain in the body in response to increased levels of prostaglandin (PG) (Yusi, 2009). Dysmenorrhea is pain during menstruation caused by uterine muscle spasms (Sylvia Anderson, 2005). Menstruation was very painful, mainly in the lower abdomen and back, and usually feels like cramps, known as dysmenorrhea or menorrhagia (Helen Varney et al, 2006).

Teenagers or "Adolescence" (UK), is derived from the Latin "adolescere" which means to grow towards maturity. Maturity in this case is not just physical maturity, but also social and psychological maturity. Adolescent age limit according to WHO is between 12 to 24 years. According to the Indonesian's Ministry Of Health it is ranged between 10 to 19 years old and unmarried. According to BKKBN it is 10 to 19 years (Yani Widyastuti, et al, 2009). Adolescence is a period of transition characterized by a change in the aspects of physical, emotional and psychological. Adolescence, ie, between the ages of 10-19 years, is a period of maturation of the human reproductive organs and is often called puberty. The occurrence of sexual maturation or reproductive organs related to the reproductive system is an important part in the lives of adolescents that required special attention (Yani Widysatuti, et al, 2009).

Nutritional status is a state of equilibrium in the form of a particular variable (Nyoman I Dewa, 2002). Nutrition is a process by which organisms use food normally consumed by the process of digestion, absorption, transport, storage, metabolism, and release of unused substances to sustain life, growth, and normal functioning of the organs, as well as generating energy (Setiyabudi, 2007). Nutritional status is an expression of a state of equilibrium in the specific form, or the embodiment of nutriture in the particular form, endemic goiter is an example of unequal circumstances of the intake and release of iodine in the body (Setiyabudi, 2007). The Measurement of body mass index (BMI) includes: Height is a common indicator of body size and bone length. Weight is an anthropometric measure most widely used.  $BMI = \frac{\text{Weight (kg)}}{\text{Height}^2 \text{ (m)}} \text{ .}$  Based on the background of the problem, in order to provide an overview of this dysmenorrhea complaint that these female students of Sports Study have, therefore it is crucial to do some research about the relationship of nutritional status and dysmenorrhea complaint to the female students of Sports Study of Faculty of Sports Yogyakarta State University.

### **Definition of Dysmenorrhea**

Some definitions of dysmenorrhea are:

- a. Dysmenorrhea is pain during menstruation until it can interfere with daily activities - day (Manuaba, 2001).
- b. Dysmenorrhea is pain in the lower abdomen or in the lower backs as a result of the movement of the uterus squeeze - squeeze (contraction) in an attempt to remove the shifted uterine lining (Faizah, 2000).
- c. Dysmenorrhea is menstrual pain that is felt in the lower abdomen, and it appears before, during or after menstruation. The pain may be colicky or continuously. Dysmenorrhea arises due to irregular contraction of the myometrium layer that displays one or more symptoms ranging from mild to severe pain in the lower abdomen, buttocks area and the medial side of the thigh (Badziad, 2003).
- d. Dysmenorrhea or menstrual pain is the usual gynecologic symptoms to find. Even women with dysmenorrhea tend to receive recurrent menstrual pain periodically that causes the patient to seek some kind of emergency treatment.

### **Classification of Dysmenorrhea**

Menstrual pain can be classified based on the type of pain and the presence or absence of abnormalities that can be observed. Based on the type of pain, menstrual pain can be divided into spasmodic dysmenorrhea and congestive dysmenorrhea.

#### **a. Spasmodic Pain**

Spasmodic pain is felt in the lower abdomen before and during menstruation begins or it occurs shortly after menstrual periods begin. Many women are forced to lie down because it was too suffering so she cannot do anything. Some of those women even getting unconscious, felt very nauseous, and some of them even have to vomit. Most sufferers are young women although it also happens to 40 years old women or even older. Spasmodic dysmenorrhea can be treated or at least reduced with the birth of the first baby although there are many women who have not experienced anything like it.

#### b. Congestive Pain

Patients with congestive dysmenorrhea usually will notice it from the previous days that her menstrual period will soon arrive. She may experience stiffness, pain in breasts, abdominal bloating, bra feels too tight, headache, back pain, stiffness in the thigh, feeling tired or difficult to understand, sensitive, loss of balance, sloppy, disturbed sleep, or bruises are seen on thigh and upper arm. These are the symptoms of sore torture that occur between 2 and 3 days until less than 2 weeks. The process of menstruation may not be too painful if it is already going on. Even after the first day of the menstrual period, people who suffer from congestive dysmenorrhea will feel better.

While based on the presence or absence of abnormality or other cause to be observed, the menstrual pain can be divided into primary dysmenorrhea and secondary dysmenorrhea.

##### 1) Primary Dysmenorrhea

Primary dysmenorrhea is menstrual pain that is found with no abnormalities in the genital organs. Primary dysmenorrhea occurs simultaneously or some time after menarche usually after 12 months or more, because of the cycle - the menstrual cycle in the month - the first month after menarche generally has such anovulator which is not accompanied by pain. The pain arises shortly before or together with the emergence of menstruation and lasts for several hours, although in some cases it can last a few days. The nature of this pain is spasm, usually it is only found on the lower abdomen but it can spread to the waist and thighs. Along with the pain, it can be found nausea, vomiting, headache, diarrhea, and irritability (Wiknjastro, 1999).

##### 2) Secondary Dysmenorrhea

Secondary dysmenorrhea is menstrual pain that is accompanied by anatomical abnormalities of the genital (Manuaba, 2001). Meanwhile, according to Hacker (2001) clinical signs of secondary dysmenorrhea are endometriosis, pelvic inflammation, fibroids, adenomyosis, ovarian cysts and pelvic congestion. Generally, secondary dysmenorrhea is not limited to menstruation; it is less associated with the first day of menstruation, it occurs to older women (usually women at thirties or forties) and it can be accompanied by other symptoms (dyspareunia, infertility and abnormal bleeding).

#### **Symptoms of Dysmenorrhea**

Dysmenorrhea causes pain in the lower abdomen which may spread to the lower back and legs. Pain is felt as intermittent cramps or as a continuous dull pain there. Usually the pain began to arise just before or during menstruation, which reaches a peak within 24 hours and after 2 days it will be gone. Dysmenorrhea is also often accompanied by headache, nausea, constipation or diarrhea, and frequent urination. Sometimes the vomiting occurs as well. According to Maulana (2008), he said that signs and symptoms of dysmenorrhea is pain on the bottom that can spread to the lower back and legs. Pain is felt as an intermittent cramping or as such continuous dull pain. It began to arise just before or during menstruation, then it reached a peak within 24 hours and later after 2 days the pain is going to disappear. It is often followed by headache, nauseous, constipation, diarrhea and frequent urination as well. Even dysmenorrhea forces some women to vomit.

#### **The Degrees of Dysmenorrhea**

Each menstruation causes pain, especially at the beginning of menstruation, but the levels of pain vary. Cyclic dysmenorrhea is divided into three levels of severity. According to Manuaba (2001), dysmenorrhea is divided into three degrees:

- a. Lightweight dysmenorrhea. Dysmenorrhea that occurs only for a while and women can continue to work everyday.
- b. Medium dysmenorrhea. At this moderate dysmenorrhea, patients need some pain medication, so that they do not need to leave the work.
- c. Weight dysmenorrhea. Severe dysmenorrhea requires the patient to rest a few days and it is followed by headache, weary waist, diarrhea, and stress.

Meanwhile, according to Potter (2006), the relative characteristics of this pain are in its severity or intensity of the pain. Clients often asked to describe the pain as mild, moderate or severe. Descriptive scale is a severity measurement tool that is more objective. Verbal Descriptor Scale (VDS) is a line consisted of 3-5 words. These descriptors are ranked from "no pain" to "unbearable pain". VDS tool allows clients to describe the pain. Pain scale should be designed so that the scale is easy to use and does not consume a lot of time when clients complete. If the client can read and understand the scale, then the pain would be more accurately described. This descriptive scale is very useful as it is not only able to assess the severity of pain, but also, evaluate the client's condition changes. Nurses can use the after therapy or when symptoms become much worse, they can assess whether the pain has decreased or increased (Perry and Potter, 2005).

### **The Nature of Nutritional Status**

Nutritional status is an expression of a state of equilibrium in the form of particular variable or it can be said that nutritional status is a good indicator of poor provision of daily meals (Djoko Pekik Irianto, 2006: 65). According Soeharjo and Hadi Riyadi (1989: 27), the nutritional status is the signs or appearance caused by the balance between nutrient intake and energy release in one hand, on the other hand it is seen through indicators of weight and height. Djoko Pekik Irianto (2006: 65-66), wrote down that the nutritional status is the study that can be done directly and indirectly. As it can be done directly, it can be divided into four kinds that are anthropometric, biochemical, clinical, and biophysics. While it is done indirectly, it includes the examination of consumption surveys, vital statistics, and ecological factors. According to Djoko Pekik Irianto (2006 : 67 ), the measurements of nutritional status based on anthropometric criteria is considered as the most commonly used because it has certain advantages, among others, as it is the most convenient and practically done and it can be justified scientifically.

From the description above, it can be concluded that nutritional status is a state of a person as a result of consuming some foods and the process in the body and suitability of food nutrients consumed and needed by the body. The health condition of the child as an overview of the consumption of food substances that enter the body and its benefits, as a result, it can be seen from the height and weight of children, which is the best indicator for determining nutritional status. Assessment of nutritional status using the Body Mass Index (Body Mass Index) is the determination of a healthy weight that is widely used and applies to adults over the age 18. The calculations are as follows : Body weight (BW) Ideal BMI are at an interval of 20-25 , were overweight (overweight) have a BMI between 25-30 , while a BMI over 30 is called obesity. Having gained the BMI, then its nutritional status is categorized based on the BMI calculation results by means of tables consulted on the nutritional state of the body. Nutritional state of the body can be seen in the following table:

**Table 1. Body Nutrition Circumstances (Djoko Pekik Irianto (2006: 74)**

No.	Nutritional Status	Male	Female
1	Petite	<20.1	<18.7
2	Normal	20.1 to 25.0	18.7 to 23.8
3	Overweight	25.1 to 30	23.9 to 28.6
4	Obese	> 30	> 28.7
	Average	22.0	20.8

### **Research Design**

This research is a research with the Mixed methods design because the data retrieval and data processing is done by two methods, both qualitative and quantitative conducted continuously. Quantitative calculation method performed on Nutritional status, whereas qualitative methods undertaken to explore complaints include dysmenorrhea complaints in particular level, kind of perceived complaints, how to overcome the dysmenorrhea complaints, and other things related to dysmenorrhea.



## Research Subject

The subject of this study of relationship between nutritional status and the incidence of dysmenorrhea is conducted on female students of Sports Science Departemet Sports Science Yogyakarta State University. The sampling technique used is the overall female student who is still registered as a student of Sports Science Departemet Sports Science Yogyakarta State University (the sampling population) who were 30, which consists of: student class of 2009 consists of 3 people, class of 2010 are 7 people, class of 2011 are 5 people, class of 2012 amounted 10 people, and class of 2013 consists of 5 people.

## Research Instrument

In quantitative research, the calculation of the nutritional status is done by collecting the data for the height and weight then it is converted into the calculation formula of Nutritional status using BMI (Body Mass Index). Assessment of nutritional status using the Body Mass Index (Body Mass Index) is the determination of a healthy weight that is widely used and applies to adults over 18 years old.

## Data Analysis Techniques

### 1. Testing Requirements (Assumption Data Analysis)

In this study, the data were analyzed by parametric statistics, namely multiple regression analysis, there are several prerequisites that must be met, which are;

#### a. Normality test

Normality test is intended to show that the samples are drawn from normally distributed populations. There are several techniques that can be used to test for normality, which are: Chi -square Test, Liliefors Test, and Kolmogorov - Smirnov Test (Sulistyo, 2010). In this study, the test for normality using Kolmogorov - Smirnov test , with the criterion if  $p > 0.05$  then the data inferred normal , and vice versa if  $p < 0.05$  then the data is not normal .

#### b . Linearity Test

Linearity test is done by finding the regression line equation for the independent variable X on the dependent variable Y. Based on the regression line which has been created, then it is tested the significance of the coefficient of the regression line and its linearity. (Sulistyo, 2010). This study used FBeda (Deviations from Linearity), with the criteria obtained indicates if the price of F with  $p > 0.05$ , means that it does not deviate from linearity, which means that it is in the linear relationship .

### 2. Correlation and Regression Analysis

The hypothesis is a temporary answer to the formulation of research problems. To prove the truth of the hypothesis, then it is done a hypothesis testing. Hypothesis testing is done after doing the analysis testing. This study which deals with the relationship between nutritional status and the female student's dysmenorrhoea complaints, then it is included in the hypothesis criteria. The data of this study is the empirical data, while according to its classification of the characteristic it is called interval data, since the interval of its scaling distance is just the same. This study is a quantitative data so that analysis using quantitative analysis techniques by using a statistical method. Product moment correlation analysis is done to answer and test the hypothesis in this study; while the regression analysis is used to strengthen the results. Product moment correlation analysis and regression analysis in this study used the help of computer software, named SPSS (Statistical Package for the Social Science).

## Research Result

In this study, there is one independent variable and the dependent variable. The independent variable is the nutritional status, in this case is the BMI (Body Mass Index), while the dependent variable is the complaint of dysmenorrhea were measured using a questionnaire. Data obtained from the questionnaire is then coded, edited, scored, tabulated, and analyzed.

## 1. Characteristics of Respondents

Characteristics of female students of Sports Science Departemet Sports Science Yogyakarta State University as research subject are summarized in Table 4 below.

**Table 4. Characteristics of study respondents (n = 30)**

No.	Respondents Characteristic	Category	Frequency	
			f	%
1.	Age	• 17 – 18	7	23,3
		• 19 – 20	13	43,3
		• 21 – 22	7	23,3
		• >22	3	10,0
2.	Pain	• No Pain	1	3,3
		• Lightweight Pain	15	50,0
		• Moderate Pain	9	30,0
		• Heavy Pain	5	16,7
		• Unbearable Pain	0	0,0

## 2. Variable Description Research

### a. Nutritional Status

The value of nutritional status from female students of Sports Science Departemet Sports Science of Yogyakarta State University in this study uses the Body Mass Index (Body Mass Index), which is the determination of a healthy weight that is widely used and applies to adults over 18 years old. From the analysis of the data with the help of computer software, it is gained central tendency values as follows: the average (mean) of 21.48; median 21.30; 20.3 mode; and a standard deviation of 2.288; and the lowest score of 16.0 and the highest 25.9.

Frequency distribution of the nutritional status of female students of Sports Science Departemet Sports Science of Yogyakarta State University based on the categorization scores are presented in Table 5. Below.

**Table 5. Distribution Data Female Students of Sports Science Departemet Sports Science of Yogyakarta State University**

No.	Weight Category	Interval	Frequency	
			f	%
1.	Skinny	< 20,1	4	13,3
2.	Normal	20,1 – 25,0	21	70,0
3.	Overweight	25,1 – 30,0	5	16,7
4.	Obesity	> 30,0	0	0,0
Total			30	100,0

Based on the frequency distribution above, it is noted that of the 30 female students of Sports Science Departemet Sports Science of Yogyakarta State University as research subjects; 4 (13.3%) were on the nutritional status of skinny categories; 21 (70.0%) normal; 5 (16.7%) are overweight; and none (0.0%) were obese student. Judging from the mean score obtained, amounting to 21.48 being the norm in the interval (20.1 to 25.0) normal category; as well as when viewed from the majority (70.0%) were in the normal category; thus it can be said that the nutritional status of female students of Sports Science Departemet Sports Science of Yogyakarta State University are in the normal category.

### b. Dysmenorrhoea Complaints

Dysmenorrhoea complaints of female students of Sports Science Departemet Sports Science of Yogyakarta State University in this study was measured with a questionnaire instrument with 63 item questions with a score of 1 to 4; in order to obtain the ideal range of scores between 63 to 252. From the analysis of the data with the help of computer software central tendency values obtained as follows: the average (mean) of 138.27; median 139.00; 153 mode; and a standard deviation of 23.199; the lowest score is 97 and the highest one is 179. Distribution frequency of dysmenorrhea complaints of female students of Sports Science Departemet Sports Science of Yogyakarta State University based categorization scores are presented in Table 6 below.

**Table 6. Distribution Data of Dysmenorrhea Complaints on Female Students of Sports Science Departemet Sports Science of Yogyakarta State University**

No.	Category	Interval	Frequency	
			f	%
1.	High	206 – 252	0	0,0
2.	Medium	158 – 205	6	20,0
3.	Less	110 – 157	21	70,0
4.	Low	63 – 109	3	10,0
Total			30	100,0

Based on the frequency distribution of the table above, it is noted that of the 30 female students of Sports Science Departemet Sports Science of Yogyakarta State University as research subjects; no students (0.0%) who reported a high dysmenorrhoea; 6 (20.0%) had moderate complaints; 21 (70.0%) less; and 3 (10.0%) low complaint. Judging from the mean score obtained, amounting to 138.27 are the norm interval (110-157) less category; as well as when viewed from the majority (70.0%) were in the poor category; thus it can be said that the complaint of dysmenorrhoea experienced by female students of Sports Science Departemet Sports Science of Yogyakarta State University is in the category of less.

### Requirements Analysis Testing (Assumption Test)

Data analysis in this study used parametric statistics, a product moment correlation analysis and regression analysis; therefore, it must meet several assumptions or requirements analysis, which are: (1) normal distribution of data, and (2) the relationship between the independent variables with dependent linear.

#### 1. Distribution Normality Test

Testing for normality distribution of the data in this study used the Kolmogorov-Smirnov method. The results of the calculation of the distribution normality test can be seen briefly in Table 7 below.

**Table 7. Summary of Distribution Normality Test Results**

Variable Data Distribution	Kolmogorov-Smirnov Z	p-Value	Conclusion
Nutritional Status (X)	0,479	0,976	Normal
Dysmenorrhea Complaints (Y)	0,570	0,902	Normal

Based on the above table, it is known Kolmogorov-Smirnov Z all  $p > 0.05$ , it is concluded that there was no difference in the frequency of observation (result) with the frequency of normal expectancy; it means that all of the data in this study are normally distributed. Thus all the data in this study met the assumptions of normality distribution.

## 2. Linearity Testing

Linearity testing is done with the help of computer software SPSS. Overall, the price of F (Deviations from Linearity) obtained indicates the price of F with  $p > 0.05$ , which means it does not deviate from linearity. Linearity test results can be seen briefly in Table 8 below.

**Table 8. Summary for the Results of Linearity Relationship Test**

<b>Fungsional Relationship</b>	<b>F Deviation</b>	<b>p Value</b>	<b>Conclusion</b>
Relationship between the nutritional status (X) and the dysmenorrhea complaints on female students of Sports Study of Yogyakarta State University in 2013 (Y)	2,486	0,139	Linear

Notes: F is F Deviation from Linearity, which means the deviation from linearity, if  $p > 0.05$  means it does not deviate or linear.

## Data Analysis and Hypothesis Testing

The hypothesis in this study is: "there is a relationship between the nutritional status and the dysmenorrhea complaint of female students from Sports Study of Yogyakarta State University in 2013". The hypothesis is the alternative hypothesis ( $H_a$ ), for the purposes of hypothesis testing is converted into a null hypothesis ( $H_o$ ), becomes: "there is no relationship between the nutritional status and the dysmenorrhea complaint of female students from Sports Study of Yogyakarta State University in 2013".

The above hypothesis was tested by using Product Moment relations and regression analysis. Data analysis used a computer software program SPSS for Windows. The calculation results obtained from table 9. Following:

**Table 9. Coefficient Product Moment Correlation between Nutritional Status and Dysmenorrhoea Painful**

<b>Tested Variable</b>	<b><math>r_{XY}</math></b>	<b>p (sig.)</b>	<b>Specification</b>
Nutritional Status (X) and Dysmenorrhea Complaints (Y)	-0,418	0,021	Significant

From the table above, it is noted that the product moment correlation coefficient (Pearson Correlation) between the nutritional status and the dysmenorrhea complaint of female students from Sports Science Departemet Sports Science of Yogyakarta State University in 2013 amounted  $r_{xy}$  -0.418 with p ( sig. ) at = 0.021. Turns  $p < 0.05$  ; and negative direction ( - ) ; thus  $H_o$  is rejected and  $H_a$  is accepted ; and concluded that there is a significant negative relationship between the nutritional status and the dysmenorrhea complaint of female students from Sports Study of Yogyakarta State University in 2013.

The significant negative correlation means the better the nutritional status, the lower the dysmenorrhea complaint of female students from Sports Study of Yogyakarta State University in 2013; and conversely the increasingly poor nutritional status (underweight), the higher the dysmenorrhea complaint of female students from Sports Study of Yogyakarta State University in 2013. To further corroborate these results, the data was also analyzed by regression analysis, regression analysis where the dependent variable is able to predict the top independent variables. Summary of the regression analysis can be seen below, as it can be seen in the attachment.

**Table 10. Summary of Regression Analysis, Nutritional Status of Dysmenorrhea Painful of Female students from Sports Science Departemet of Yogyakarta State University**

Variable	Coefficient B	Std Error	Std. Coef Beta	t	p
Constant	229,396				
Nutritional Status (Y)	-4,242	1,741	-0,418	-2,437	0,21
R =	0,418				
R <sup>2</sup> =	0,175				
F <sub>Regresi</sub> =	5,937				
p =	0,021				

Description:

R<sup>2</sup> = Coefficient of Determination

R = Coefficient of Correlation

From the regression analysis table above, it is gained the value of F at = 5.937 with p < 0.05; significant concluded. The regression equation that can be set are as follows:

$$Y = 229.396 + (-4.242 X)$$

The regression coefficient has such meaning that if the nutritional status of the unit increased highly, the dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University will decrease (negative) equal to 4.242 ; by assuming that the other variables remain unchanged or not (*ceteris paribus*).

Contributions or donations effectively to dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University can be seen from the determinant coefficient ( $r^2$ ). In this study, the determinant coefficient ( $r^2$ ) of = 0.175; meaning that 17.5 % of dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University is determined by the nutritional status of 17.5 %; or 82.5 % and the rest is determined by factors outside of the study.

### Research Result Discussion

The results of the analysis on the characteristics of respondents note that the majority of respondents in this study aged 19-20 years (43.3%); and the pain level of the majority of respondents feel "mild pain" (50.0%). Descriptive analysis on the study variables, it is known that the daughter of 30 female students from Sports Study of Yogyakarta State University; 4 (13.3%) had a lean nutritional status; 21 (70.0%) normal; 5 (16.7%) are overweight; and no one was in the obese category. The majority of nutritional status of female students from Sports Study of Yogyakarta State University was normal (70.0%).

The results of the analysis on the dependent variable of dysmenorrhoea complaints is known that the 30 female students from Sports Study of Yogyakarta State University; no student who reported a high dysmenorrhoea; 6 (20.0%) level of the complaint being; 21 (70.0%) level of less complaint; and 3 (10.0%) is in low level. This hypothesis testing concluded that there is a significant negative relationship between the nutritional status and the dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University in 2013. Significant negative relationship means the better the nutritional status, the lower the dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University in 2013; and conversely the increasingly poor nutritional status (underweight), the higher the dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University in 2013.

Gained from regression analysis of determinant coefficient ( $r^2$ ) of = 0.175; this means that 17.5% of dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University is determined by the nutritional status of 17.5%; or 82.5% and the rest is determined by factors outside of the study. Due to the negative relationship, then the effect is the decrease in complaints of dysmenorrhoea, meaning that the better nutritional status, the complaints are getting down.

## CONCLUSION

Dysmenorrhea is pain due to menstruation and the prostaglandin production on pelvic areas. It is often initiated immediately after a first period (menarche). The pain is reduced after menstruation, but in some women may continue to experience pain during the menstrual period. The cause of the pain comes from the muscles of the uterus. Like all other muscles, the muscles of the uterus start to contract and relaxation. The contractions are getting stronger during menstruation. Contraction that occurs is caused by a substance named prostaglandins. Prostaglandins are made by the inner lining of the uterus. Before menstruation occurs, the substances are increased and when menstruation occurs, it gets the decreasing prostaglandin levels.

Dysmenorrhea typically occurs in adolescence, which is about 2-3 years after the first period. Secondary dysmenorrhea often begins to emerge at the age of 20 years old. Other factors that can aggravate dysmenorrhea are: 1) the uterus is facing backwards (retroverted), 2) lack of exercise. 3) psychological stress or social stress.

There was a significant negative relationship between the nutritional status and the dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University in 2013. Increasingly good nutritional status, the lower the dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University in 2013, and vice versa. Nutritional status is able to reduce the level of dysmenorrhoea complaint on female students from Sports Study of Yogyakarta State University at 17.5%; The low incidence and severity of symptoms of dysmenorrhea are also low in athletes and it can be caused by low levels of prostaglandins, which are caused by the high anovulatory cycles or changes in patterns of endocrine (reduction of LH, short luteal phase, estradiol/progesterone is low). In addition, athletes may have a high pain threshold. But psychological factors should also be taken into account regarding this dysmenorrhea. (Harzuki 2003, Fox 1993).

## REFERENCE

- [1] Anamika S, Devender T, Pragya S, Renuka S. Problems related to menstruation and their effect on daily routine of students of a medical college in Delhi, India. *Asia Pac J Pub Health*. 2008 [disitasi 21 Januari 2009] 20(3):234-41. Diunduh dari: <http://aph.sagepub.com/cgi/content/abstract/20/3/234>
- [2] Arikunto, 2005, *Prosedur Penelitian Suatu Pendekatan Praktik*. Jakarta: PT. Rineka Cipta.
- [3] Arifin, 2009. *Nyeri Haid*. Majalah Dokter Kita Edisi 7- th II-2009.
- [4] Arisman. 2002. *Gizi Dalam Daur Kehidupan*. Palembang: Direktorat Jendral Pendidikan Tinggi Departemen Pendidikan Nasional.
- [5] Calis KA, Popat VP, Dang DK, Kalantaridou SN. Dysmenorrhea [disitasi 21 Januari 2009]. Diunduh dari: <http://emedicine.medscape.com/article/253812-overview> 6. Bieniasz J, Zak T, Laskowska-Zietek A, Noczyska A. Causes of menstrual disorder in adolescent girls – a retrospective study. *Endokrynol Diabetol Chor Przemiany Materii Wieku Rozw*. 2006 [disitasi 21 Januari 2009] 12(3):205-10. Diunduh dari: <http://www.ncbi.nlm.nih.gov/pubmed/17020657>.

- [6] Dahono. 2001. *Gizi Dasar*. Bandung. Alfabeth.
- [7] Djoko Pekik Irianto. (2006). *Panduan Gizi Lengkap Keluarga dan Olahragawan*. Yogyakarta: Andi Offset.
- [8] Genie, 2009, Kurangi Nyeri Haid dengan Terapi Energi Cair lewat <http://m.okezone.com>. yang direkam pada 11 Mar 2009 19:53:36 GMT
- [9] I Dewa Nyoman Supriasa, dkk. 2001. *Penelitian Status Gizi*. Jakarta: Kedokteran EGC.
- [10] Ibnu Fajar. 2001. *Ilmu Gizi*. Jakarta: Bumi Aksara
- [11] Isaacs, 2004. Konsep dan Penatalaksanaan Nyeri. Jakarta: EGC.
- [12] Junizar, 2009, Pengobatan Dismenore secara Akupunktur, Cermin Dunia Kedokteran No. 133, 2009: 53 yang direkam pada 11 Mar 2009 19:53:36 GMT.
- [13] Lee LK, Chen PCY, Lee KK, Kaur J (2006). Menstruation among adolescent girls in Malaysia: a cross-sectional school survey. *Singapore Med J*. 2006 [disitasi 21 Januari 2009] 47(10):869. Diunduh dari: <http://www.sma.org.sg/smj/4710/4710a6.pdf>.
- [14] Logue CM, Moos RH. Perimenstrual symptoms: prevalence and risk factors. *Psychosom Med*. 1986 [disitasi 21 Januari 2009] 48(6):388-414. Diunduh dari: <http://www.psychosomaticmedicine.org/cgi/reprint/48/6/388>.
- [15] Mediastore, 2009, Penatalaksanaan Fisioterapi Pada Nyeri Haid, <http://mediastore?newsid1059624784,96412>, yang direkam pada 11 Mar 2009 19:53:36 GMT.
- [16] Soekirman. 2000. *Ilmu Gizi dan Aplikasi Untuk Keluarga dan Masyarakat*. Jakarta: Direktorat Jenderal Pendidikan Tinggi.
- [17] Sugianto. 2001. *Metodologi Penelitian*. Jakarta: Gunung Agung.
- [18] Suharsimi Arikunto. 1991. *Prosedur Penelitian Suatu Pendekatan Prektek*. Jakarta: Rineka Cipta.
- [19] Vegas A, Juraini N, Rodiah, Rahayu N, Fajarini D, Annisa, *et al*. (2004) Pengetahuan, sikap, dan perilaku mahasiswi tentang dismenorea dan faktor-faktor yang berhubungan pada mahasiswi tingkat satu dan dua universitas “X” di Jakarta [laporan penelitian]. Jakarta: Fakultas Kedokteran Universitas Indonesia.
- [20] Warner P, Hilary ODC, Lumsden MA, Campbell-Brown M, Douglas A, Murray G. (2001). Referral for menstrual problems: cross sectional survey of symptoms, reasons for referral, and management. *Br Med J*. [disitasi 21 Januari 2009] 323:24-8. Diunduh dari: <http://www.bmj.com/cgi/content/abstract/323/7303/24>.
- [21] Widayanto, 2009. Dismenorrhoe. [widayanto.com](http://widayanto.com), direkam pada 21 Juli 2009 18:43:16 GMT. sumber: The Merck Manual Of Medical Information, ed 1997, hal 1086-1087, [medicastore.com](http://medicastore.com)

# WARMING-UP EXERCISES FOR MINI-VOLLEYBALL

Danang Wicaksono

Yogyakarta State University, Indonesia  
danangvolipko@yahoo.com

## Abstract

Sport performance, like the part of iceberg above the water, looks small. However, below the surface, the supports and efforts to reach the performance are huge and strong. Performance in volleyball, for example, can be gained by strong and quality foundation. Developing volleyball performance starts from early age to teenage, junior, and senior levels. The earliest level, the early age, is the foundation which should be strongly and qualifiedly developed. A trainer should understand which materials should be prepared to construct the foundation of a volleyball athlete. A complete exercise consists of three consequential exercises: warming-up, core, and cooling-down. The warming-up contributes to the successful core exercise. When joining mini-volleyball exercise, an interesting warming-up should be given to early age children. It will greatly motivate them and they will join the exercise happily. Therefore, the trainer should be creative in creating and giving the warming-up for these mini-volleyball athletes. Combination in movements, with or without equipments, should be used, so the mini-volleyball exercise will not be boring and these young athletes will be more interested and excited to join it. The trainer's creativity in giving warming-up in mini-volleyball exercise will support children's multilateral development. The children will also gain great motivation as they love to join the exercise.

**Key words:** warming-up, mini-volleyball

## INTRODUCTION

More serious attention should be paid to the development of Indonesian volleyball. The achievement gained in multi-sport event or regional volleyball championship marks the result of the volleyball coaching. Being observed from the world rank, the Indonesia senior men's volleyball team is still under Thailand. According to FIVB for senior volleyball world rank (as of January 2014), Indonesia is currently ranked 62<sup>nd</sup> and Thailand is ranked 34<sup>th</sup>. Meanwhile, the Indonesia senior women's volleyball team is ranked 100<sup>th</sup> in the world, positioned far under Thailand (12<sup>th</sup>) and Vietnam (44<sup>th</sup>). The youth and junior teams also face the similar condition. The Indonesia youth and junior men's volleyball teams are ranked 79<sup>th</sup> in the world while Thailand is ranked 48<sup>th</sup>. Almost similar to this result, the Indonesia youth and junior women's volleyball teams are ranked 76<sup>th</sup>, under Thailand (17<sup>th</sup>), Sri Lanka (68<sup>th</sup>), and Malaysia which is also ranked 76<sup>th</sup> but is still above Indonesia. This clearly portrays the condition of Indonesian volleyball team in the world and South East Asian levels, being observed from the world rank.

Sport games coaching, in this case volleyball, is conducted in different levels. It starts from the lowest to the highest level, or in other words, beginner, youth, junior, and senior levels. The activities in the inter-level coaching are interrelated and interconnected. Thus, they cannot be separated from each other as the coaching should be best conducted in all levels. The reason can be clearly observed from the ranks. For example, in the youth, junior, and senior levels, the Thailand's volleyball team is always above Indonesia's.

The most basic coaching in volleyball is conducted in the beginner level, or widely known by a term 'mini volleyball'. This level is the lowest one or the foundation, which should be completed by all volleyball athletes, according to the mechanism of sport games coaching. Quality foundation gives better influence and contribution to the next level. Therefore, exercises in this level are meant to prepare the general skills in volleyball.



The exercises should be conducted systematically and logically, started from warming-up, continued with core exercises, and ended with cooling-down. These three sequences in exercises should be done maximally and chronologically. The success of the core exercise is influenced by the quality of the warming-up and the exercise of the next session is totally influenced by quality of the cooling-down (related to the recovery). As a result, the warming-up, core exercise, and cooling-down are inseparable components in a session of exercise. These three are parts of one systematical unit which should be conducted in a session of exercise.

Being observed from the condition of volleyball coaching in the basic level (mini-volleyball), many coaches still lack of creativity in giving good warming-up. They think that it is enough to conduct traditional warming-up (the one conducted with static and dynamic movements). Ironically, this kind of warming-up is conducted continuously in a long term so that the multilateral and creativity development of the athletes are not optimally trained. The athletes only perform customary movements without any combination or variation.

The coach should remember that childhood is playing time. Children love to play, so the coach should not restrict it. He should be creative in looking for variation and giving warming-up which contains playing, so that the children will love to do it without feeling bored. The warming-up can use the ball, to make the children become more excited and get used to holding it, which helps them feel the touch with the ball. The ball for volleyball is especially made with special material and gas-pressure. Therefore, the children should be introduced to it early, so they will have sharp feeling with the ball.

### **THE DEFINITION AND IMPORTANCE OF WARMING-UP**

Sport games coaching should be conducted systematically, or in other words, in a fixed sequence. The sequence starts from warming-up, core exercise, and ends with cooling-down. According to Santoso G. (2007: 155), warming-up for muscle activity is not for increasing the muscle's strength but only for preparing the condition and readiness of the muscle to perform the real activities: the training and the match.

The goals of warming-up according to Elizabeth Quinn found in <http://sportsmedicine.about.com/cs/injuryprevention/a/aa071001a.htm> are to gain:

1. increased muscle,
2. increased body temperature,
3. blood vessels dilate,
4. improved efficient cooling,
5. increased blood temperature,
6. improved range of motion,
7. hormonal changes, and
8. mental preparation.

Meanwhile, James Peterson ([http://www.24hourfitness.com/resources/fitness/articles/warm\\_up.html](http://www.24hourfitness.com/resources/fitness/articles/warm_up.html)) gives ten reasons why sport should begin with warming-up. These reasons are as follows:

1. to increase degradation of oxyhemoglobin,
2. to increase body temperature,
3. to increase blood flow to exercising muscles,
4. to increase blood flow to the heart,
5. to decrease muscle viscosity,
6. to help promote sweating,
7. to enhance the speed of transmission of nerve impulses,
8. to increase the blood saturation of muscles and connective tissue,
9. to prepare the cardiovascular system for impending workload, and
10. to prepare muscles for impending workload.

## **KINDS OF WARMING-UP**

Santos G. (2007: 154-159) believes that there are four kinds of warming-up:

1. First stage warming-up  
In the first stage, the warming up contains a lot of stretching and exercising flexibility of joints but snap movements are not performed yet. The aim is to prepare the condition and readiness of all system involved in the joints' movements (joint capsules, tendons, and muscles working in joints).
2. Second stage warming-up  
The second stage warming-up contains activities for muscles which will be used for core exercises or match. The warming-up can be conducted with traditional dynamic and static movements.
3. Third stage warming-up  
The third stage warming-up is a basic nerve exercise (coordination exercise) and especially conducted according to the kinds of sports which contain special technical skills. This kind of warming-up is also called as formal warming-up.
4. Fourth stage warming-up (facultative)  
The fourth stage warming-up is conducted when the body temperature is still low, thus it still needs to be warmed up. This kind of warming-up is also named general warming-up, by activating a large number of muscles simultaneously.

## **MINI-VOLLEYBALL**

In "Coaches Manual 1", it is explained that mini-volleyball (MV) is a methodically simplified volleyball adapted to the capacities and needs of children from ages 9 to 13. Mini-volleyball is a suitable teaching method and proven approach to volleyball for children. This simplified volleyball is needed to introduce volleyball to children. The rules, equipments, and facilities are modified to ease the children to play. This stage is the initial effort to make the children love this sport.

In mini-volleyball, victory is not too demanded. Related to this, Hiroshi Toyoda (2008: 4) states that winning is not the ultimate goal in mini-volleyball. One should always remember that coaching mini-volleyball is about providing valuable experiences that children need for the future, while enabling them to experience the joys of self-improvement.

## **FORMS OF WARMING-UP FOR MINI-VOLLEYBALL**

Mini-volleyball is played by children, thus the characteristics of children should be well-understood. The Australian Sports Commission in [http:// www.ausport. Gov .au /participating /coaches/tools/coaching\\_ children/Children](http://www.ausport.gov.au/participating/coaches/tools/coaching_children/Children) demands that in coaching children, the coach should consider some points as follows:

1. Children's sport should be fun
  2. Children need lots of opportunities for unstructured
  3. Play, a broad range of activities, and the opportunity for creativity
  4. Early sports specialisation is not recommended for young children the social aspects of sport are highly valued by children
  5. Coaches should focus on skill development and individual improvement, rather than winning as the outcome
  6. All children deserve time and attention, not just the most talented
- Forms of warming-up which can be used for mini-volleyball are:
1. Get the children to rolling the ball with one or both hands. Form the fingers, just like when doing overhand pass. The thumb and the index finger shape like 'V' while the others relax, holding the outer part of the ball. Then, with the position, get them to roll the ball, so that it rolls with top spin. Rolling the ball can be done by one or two hands. By using two hands, the easiest way is by crossing two little fingers so that both palms are connected. After it is done maximally, ask them to separate their crossing little fingers. Place the little fingers side by side and then roll the ball.



Hiroshi Toyoda (2008: 24)

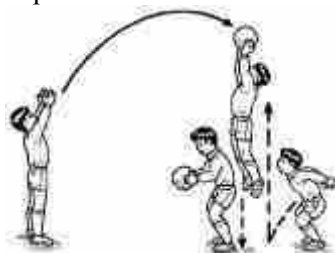
2. Get the children to roll the ball between two feet, shaping like '8'. Open the feet minimally as wide as the shoulder, then ask them to roll the ball by passing it between the two feet, shaping like '8'. The ball will roll with top spin. Form the palm and the fingers like when doing overhand pass. The thumb and the index fingers shape like 'V' while the other fingers relax, holding the outer part of the ball.
3. In this exercise, get them to pass the ball between two knees, shaping like '8'. Open the feet as wide as the shoulder, hold the ball, and pass it between two knees, shaping like '8' pattern.
4. Ask the children to bounce the ball with one or two hands. The ball will roll with top spin. Form the palm and the fingers like when doing overhand pass. The thumb and the index fingers shape like 'V' while the other fingers relax, holding the outer part of the ball. Bounce the ball by tossing it with the index finger, middle finger, ring finger, and little finger in their first and second knuckles and with the thumb in its first knuckle. If it is done with two hands, place the two thumbs side by side or cross them. The ball can be bounced on the floor or on the wall, on site or by moving/walking. The height of the bounce may vary, from the lowest position, to as high as the knees, or to as high as the hips.
5. In this drill, the children are to throw the ball from behind the body with one hand, pass it through the shoulder of the other hand, and catch it above the head. Get the athletes to stand upright, and then with one hand, try to throw the ball from behind the body. Make sure the ball pass from behind the body to above the shoulder of the other hand. Then, get them to try to catch the ball above their head. Use the left and right hands by turns.
6. Get the children to throw the ball between their legs and catch it in front of their body. Get the children to open their legs and throw the ball between their legs and bottom, and catch it in front of their body. Ask them to bend forwards as far as possible and get them to throw the ball upwards, close to their body, above their bottom.



Hiroshi Toyoda (2008: 16)

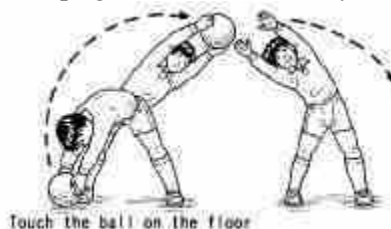
7. Ask the children to lift their left and right thighs by turns and pass the ball under the thigh. Get the children to lift the knee as high as the hip and pass the ball under the thigh. Lift the left and right thighs by turns. Start the exercise in slow motion and increase the speed gradually.
8. In this exercise, the children are to throw the ball and catch it on site. To do this exercise, get the children to put their arms straight, just like when doing underhand pass; then swing the ball right above them. Make sure they catch the ball with one swing by putting their arm straight, in its highest catching point. Another variation of this exercise begins with jumping or walking before throwing the ball.

9. Make the children throw the ball to the highest reaching point and then release it in front of their forehead. The throwing can be directed to above, straight ahead, or bottom.
10. Get the children to put their arms straight and place the ball just like when doing underhand pass. Ask them to maintain this stance and then combine it with other movements like lifting the thighs, lifting the heels, stepping aside, stepping on site, etc.
11. In this drill, the children are asked to throw and catch the ball in pairs. This exercise is done in pairs. The thrower should throw the ball by swinging the hands and keeping the arms straight. The catcher should catch the ball by swinging the hands, putting the arms straight, and catching the ball in its highest point.



Hiroshi Toyoda (2008: 22)

12. In this exercise, make the children pass the ball to their side by keeping their hands and arms straight. To do this exercise, stand upright and bend the body to the left and right by turns.



Hiroshi Toyoda (2008: 26)

13. Get the children to pass the ball by twisting their body. This exercise is done in pairs. Get the children to stand upright and face away from each other. Ask them to twist their upper body to the right (without changing the position of the legs) to hand the ball to each other. The course of the ball to the body shapes like '8'.



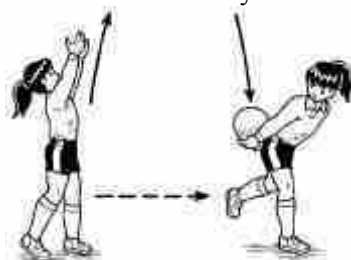
Hiroshi Toyoda (2008: 26)

14. Ask the children to pass the ball by twisting the body and throwing the ball to their partner. This exercise is done in pairs. Get the children to stand upright and face away from each other. Ask them to twist their upper body to the right (without changing the position of the legs) to hand the ball to each other. The course of the ball to the body shapes like '8'.



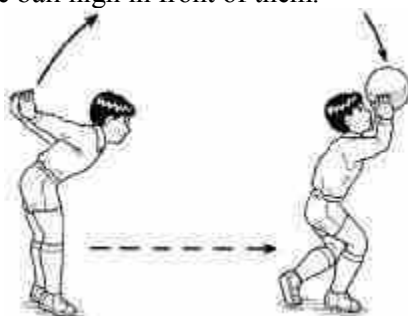
Hiroshi Toyoda (2008: 22)

15. Make the children throw the ball by swinging their hands and keeping the arms straight. Ask the children to try to catch the ball behind their body.



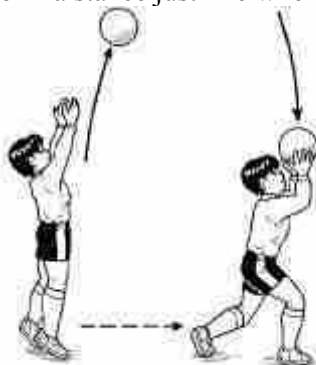
Hiroshi Toyoda (2008: 16)

16. Ask the children to throw the ball from behind their body by swinging their hands above and keeping their arms straight, and then ask them to catch it in front of them, above their head. When releasing it behind their back, ask the children to bend their back slightly and use a wrist-snap motion to send the ball high in front of them.



Hiroshi Toyoda (2008: 18)

17. Get the children to throw the ball by swinging their hands and keeping the arms straight, and then ask them to try to catch it with the initial position, keeping the feet as wide as the shoulder and bending the knees slightly. Get the children to get their hands ready in front of their forehead and the fingers form a stance just like when doing overhand pass.



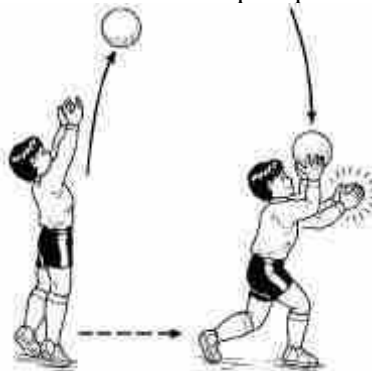
Hiroshi Toyoda (2008: 15)

18. In this drill, make the children throw the ball with the initial stance just like when doing overhand passing technique. Throw the ball on site by twisting the body 90° or 180 ° and try to catch it by performing the similar method.



Hiroshi Toyoda (2008: 15)

19. Get the children to throw the ball by swinging the hands and putting the arms straight. Then, ask the children to clap their hands before catching the ball. For the initial position, put the feet as wide as the shoulder and slightly bend the knees. Put the hands in front of the forehead with fingers forming stances of overhand pass position.



Hiroshi Toyoda (2008: 15)

20. In this exercise, ask the children to clip the ball between their two feet. While jumping, bring the ball above, and then, catch it.



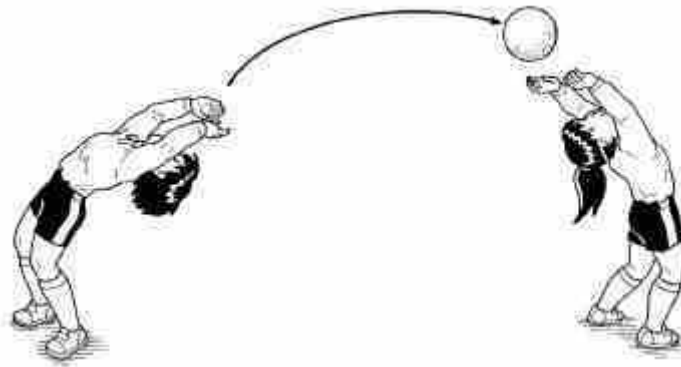
Hiroshi Toyoda (2008: 25)

21. This exercise is done in pairs by facing away from each other. Get the children to pass the ball between their legs to their partner, then the partner try to give it back over their head.



Hiroshi Toyoda (2008: 26)

22. In this exercise, get the children to throw the ball to behind their body. The initial stance is just like when doing overhand pass.



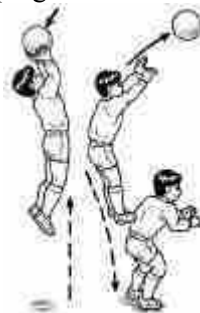
Hiroshi Toyoda (2008: 21)

23. Ask the athlete to lie on their stomach and do the ball throwing and catching. When throwing or catching the ball, the chest is to be lifted.



Hiroshi Toyoda (2008: 21)

24. In this exercise, ask the children to jump while throwing the ball. The ball is thrown just like when doing overhand pass while jumping.



Hiroshi Toyoda (2008: 22)

## CONCLUSION

Sport games coaching should be well-planned and done continuously. As one of sport games coaching, volleyball coaching starts with mini-volleyball, in order to help introduce this sport to children. The activity should be made as interesting as possible to show them that playing volleyball is easy. Therefore, the warming-up before beginning the core exercise should contain exciting playing movements to introduce how volleyball is played.

The warming-up for mini-volleyball is conducted with or without any equipments or balls. In this article, the exercise is given by using the ball for volleyball. Through this exercise, both general and special movements can be performed. The special movements are the movements which are commonly used in volleyball, for example, the basic movements in the games. These movements can be simply but interestingly modified so that the children can easily perform them and become excited. More importantly, the basic techniques in volleyball should be arranged from the easiest to the most complicated ones and from the simplest to the most complex ones. This is to make the children excited and interested to do it, so they will understand that learning to play volleyball is not a difficult matter.

## **ACKNOWLEDGMENT**

The authors wish to thank profusely, for the grace of God, so that this paper can be completed and can be included in an international seminar (International Seminar of Sport Culture and Achivement) in UNY. Acknowledgements always intended to motivate families to continue to be creative and excel at FIK UNY as the institution where I served. I would like to thank the leaders of the university and the faculty, senior lecturer as my mentor in a career in FIK UNY. Thank you to a contemporary colleague who always tried to maintain a shared commitment to the advancement of FIK UNY.

## **REFERENCES**

- [1] Australian Sports Commission. Di download tanggal 2 April 2014 dari [http:// www.ausport. Gov .au /participating /coaches /tools/ coaching\\_ children/ Children](http://www.ausport.gov.au/participating/coaches/tools/coaching_children/Children)
- [2] Elizabeth Quinn .2013. How To Warm Up Before Exercise A proper warm up has important exercise benefit. Di download tanggal 2 April 2014 dari [http: // sportsmedicine. about. Com / cs/injuryprevention/a/aa071001a.htm](http://sportsmedicine.about.com/cs/injuryprevention/a/aa071001a.htm).
- [3] Hiroshi Toyoda. (2008). Mini-Volleyball Handbook. Japan H.Y.S. Santoso G. (2007). Ilmu Faal Olahraga: fungsi tubuh manusia pada olahraga. UPI Bandung.
- [4] James Peterson. Warming-up. FACSM. Di download tanggal 2 April 2014 dari ( [http://www. 24hourfitness.com/resources/fitness/articles/warm\\_up.html](http://www.24hourfitness.com/resources/fitness/articles/warm_up.html)
- [5] Manual Coaches 1 Capter 8 di download dari <http://fivb.org> pada tanggal 13Oktober 2011



# **GATEBALL AS AN ALTERNATIVE SPORT TO MAINTAIN PHYSICAL FITNESS OF ELDERLY**

**Fatkurahman Arjuna**

**Yogyakarta State University, Indonesia**

## **Abstract**

Elderly is defined as a process of decline, weakness and susceptible to various diseases and changes of physiology that is related to age. The characteristics of elderly are reduction of five sense work ability, organ disorders, psychological changes, and the emergence of a various diseases. It is nearly 50 % the decline of body function is affected by reduced activities. The decrease of the ability can be minimized by always keep the physical fitness and manage healthy lifestyle. Physical fitness is a person's ability to perform everyday tasks without significant fatigue and still have spare energy to enjoy their leisure time. The good physical fitness is impossible without planning and an understanding of healthy lifestyles as well, there are three attempts to do to get the physical fitness that is by setting up diet, enough taking a rest and exercising regularly. Good exercise for the elderly is a sport that can improve or maintain physical fitness. The components of physical fitness should be trained for the elderly include heart lung endurance, muscle strength and endurance, joint flexibility and body composition. One sport that is growing and dominated by the elderly is gateball sport. This exercise can be good for the elderly and physical fitness training specifically related to health. The benefit of sport gateball is to make a culture to maintain physical fitness in a way: create a community for the exercise gateball routine, the routine determines gateball exercise schedule, establish communication with other gateball community organizing regular matches with other communities. By coming together with the community can not only exchange information but also the confidence and spirit to stay healthy and fit.

**Keywords:** Elderly, physical fitness, gateball

## **INTRODUCTION**

Elderly is an occurrence that will be experienced by every human being endowed with a long life by Almighty God. According to the Indonesia Law Number 4 of 1965, elderly is someone who reaches the age of 55 years that is powerless to make a living themselves for the purposes of daily life and receive a living from other people.

Elderly is not a disease, although it can cause a variety of impacts in social issues. In developed countries, the life expectancy grows longer; many people have more than 65 years old. In the Year 2011, CIA World Factbook estimates the life expectancy of Indonesia as a whole is 70.74 Years, if distributed by sex then Indonesian male life expectancy is 68.26 and women 73.38 years (Yahmin, 2012: 1).

Yahmin (2012:1) states that signs of the elderly is a reduced by ability to work by the five senses, organ disorders, psychological changes, and the emergence of a variety of diseases. In the body function, it declines 50% due to reduced activity. Some of the effects that occur in various organs due to immobilization is on cardiovascular and respiratory organs, and body musculoskeletal composition, nerves system, sensory, and intellectual capacity function (cognitive, or in memory) (Nieman, 1989). With the body function decline in elderly, there are so many health problems that are faced, the health of the elderly which is directed at health care, the ability to keep productive, capable, independent and dependent to others.

Theoretically, elderly is the age at which in need of help from others because of reduced ability to work or organ function decline. In elderly, certainly, they want to be healthy and can

do works without the hassle or the help of others. One way to do is to maintain physical fitness. Namely by adjusting the diet, good rest, and that the most important is by exercise or physical activity on a regular basis.

Sport is the most difficult because it must be adjusted to the abilities of elderly compared to regulate food intake and rest. Ignorance about the sport you play can also be fatal and cause injury. Before doing exercise, first to know the physical condition of the elderly is intended to measure the ability of exercise to be undertaken.

From the theories of the elderly, they should not be discouraged and resigned to the situation, because each person's condition is different. Physiologically, elderly has been decreased the functions of the body, but from the few studies that have been done that by doing physical activity or exercise can maintain the state of condition of the body to continue to work and not depend on others. However, not many is known to be appropriate type of exercise for the elderly in accordance with the needs and abilities.

Basically, any kind of exercise is good for the elderly as long as fit with the local capacity and not be harmful to the body as well as direct physical contact sports. The recommended types of aerobic exercise are such as cycling, walking, and swimming. However, the sport if done continuously will certainly be able to give rise to boredom. In Indonesia, the growing sport and is dominated by the elderly is gateball, but most of them do not know how and what kind of the sport in which it is good for the elderly.

## **THE DEFINITION OF ELDERLY**

Elderly is a phenomenon that will be experienced by everyone being endowed with a long life by God. According to the Indonesia Law Number 4 of 1965, elderly is someone who reaches the age of 55 years that is powerless to make a living themselves for the purposes of daily life and receive a living from other people. Meanwhile, according to the Indonesia Law Number 12 of 1998 about elderly welfare, elderly is someone who has been more than 60 years old (Psychologymania, 2012).

According to WHO, quoted by Psychologimania (2012), the elderly definition is categorized in four types:

1. Middle age is 45 – 59 years old
2. Elderly is the age between 60 – 74 years old
3. Old is the age between 74 – 90 years old
4. Very old is the age above 90 years old

From the definition above, it does not mean that all elderly are helpless and receive income from other people. The helplessness can be minimized with a healthy lifestyle and physical activities that are good. It is said that the elderly who are older than 60 years and can carry out their activities as well as day-to-day job without the help of others to say that the elderly have a good potential.

Many studies from experts find that elderly who have a relaxed lifestyle and tend to sit idle can increase the risk of death from heart disease due to weakening of the muscles work function. From these studies, it is the elderly who are encouraged to keep exercising and physical activity with the dose, frequency, and volume which are measured or with assistance from experts.

## **PHYSICAL FITNESS**

### **A. The Definition of Physical Fitness**

Physical fitness is derived from English Physical Fitness, which literally means the physical suitability or fitness physical. This means that there is a physical conformity with the type of work performed in everyday life or in other words that is fitted by which it is a physical component to the tasks in meeting the demands of everyday life (Suharjana, 2012: 2). Physical fitness can also be referred to physical fitness or physical preparedness. The term is often referred to the physical fitness in fitness clinic (fitness center) and gymnastics,

physical fitness term is often used in schools while the preparedness is often used among the military, such as police officers, soldiers and cadets.

In general, fitness is a question of physical fitness (physical fitness) which is the ability of a person to do works efficiently in daily basis without incurring excessive fatigue so they can enjoy their leisure time. (Djoko Pekik, 2004: 2). Elderly who have good physical fitness that will be very useful in everyday activities because it has more ability to do the job.

In elderly whose physical fitness exercise is very low at a lower intensity for example 40% of maximum heart rate, it would be safer and can improve physical and mental fitness so they do not rely on others (Giam, 1993).

## **B. Physical Health Components**

Djoko pekik (2004: 5), claims physical fitness that relates to health has four main components, namely:

1. The durability of the heart lungs that is heart lung's ability to supply oxygen to the working muscles in the long term.
2. Muscular strength and endurance  
Muscle strength is the ability of muscles against a load in one attempt.  
Muscle endurance is the ability of the muscle do the work set in a long time.
3. Flexibility: the ability to move joints freely. \
4. Body composition is the ratio of body weight in the form of fat to lean body weight expressed in percentage of body fat.

## **C. How to Get Physical Fitness**

Good physical fitness will not be obtained without going through the planning and understanding about healthy lifestyle that are good also, there are three attempts to do to gain physical fitness; eating, exercising, and taking rest (Djoko Pekik, 2004: 7).

### **1. Eating**

Keeping your diet is one of the factors that affects health and fitness. With increasing age of a person, the body's metabolic rate tends to decrease, and then the nutritional needs of the elderly will need to be balanced with the needs. Caloric needs of the elderly would be reduced; it is largely attributable due to reduced physical activity. Puti Rizka (2011: 1) claims that good menu for the elderly is:

- a. Food contains nutrients which consist of energy, builders and regulators substances.
- b. The proper number of calories consumed by elderly 50% is derived from carbohydrate, vegetables, nuts, and grains.
- c. Limiting the amount of fat that is in foods.
- d. Large number of fibrous foods in fruits, vegetables, and various starches.
- e. Consuming calcium-rich foodstuffs such as fish and non-fat milk.
- f. Many foods that contain iron such as beans, liver, spinach, or green vegetables.
- g. Limit salt intake, avoid foods that contain alcohol.
- h. Try soft foods and easy to chew.
- i. Try to avoid foods that are too sweet, savory and greasy.

### **2. Resting**

Rest is the body's right to make improvements and physical functions in which in this phase the body can also absorb oxygen work optimally. With adequate rest, the body will come back refreshed and ready to do the next job. For elderly, it takes a rest for 6-7 hours per day.

Anggelinasinta (2013) says that the resting functions for our body are:

- a) To regenerate the broken body cells to be new
- b) To add concentration and physical ability
- c) To accelerate the hormone production of body's growth
- d) To maintain the heart function

- e) To rest the tired body after working
- f) To improve body immune from diseases.

### 3. Exercise

Exercise is a type of physical activity that is done consciously and with certain purposes. Systematic exercise is aimed to keep or maintain physical fitness that is aerobic activity. Non contact physical sports are not recommended for elderly. Gateball is an excellent exercise for maintaining the physical fitness of elderly. There is a concentration element, cardiac pulmonary component durability because the game is done for 30 minutes with a large field. Strength and muscular endurance components are used to hit the ball. Components of body flexibility are needed when hitting the ball and when the game gateball is underway.

## D. Physical Fitness Exercise

Stages of exercise are a series of exercises in each workout process includes warming up, conditioning and calming, for this stage, it should be done sequentially.

### 1. Warming Up

Warming is done before doing the exercises in this case it is the gateball sport. Warming up aims to prepare organ function to be able to accept the imposition of a heavier weight than actual practice. Warming up if done properly can reduce the risk of injury, moreover, so in this case the elderly are susceptible to injury. Gateball sport is a sport that uses time as the game and use the tool as a support of the game.

Warming is done starting from the upper body component to the very low. Gateball is a sport that requires elements. Warming is done with a sequence ranging from low aerobic activity, stretching, calisthenics movements, and formal activities that include the actual movement.

### 2. Conditioning

After warming up, then it is followed by conditioning stage. Conditioning is done with a series of motion exercises with the model that corresponds to the purpose of the exercise program. As is the case with gateball sports, exercise conditioning is start gateball accordance with applicable regulations. Gateball sport can be played in accordance with the level of ability, it also can be played with a start time of 15 minutes, 20 minutes, 25 minutes and usually played for championship in 30 minutes and can be re-played.

### 3. Relaxing

This stage is often forgotten, usually after completion of conditioning, the relaxing is skipped. This stage is not as important as the other stages, which aims to restore the body like before doing the exercise. Relaxing also serves to return blood to the heart for re-oxygenation, thus, preventing a pool of blood in the leg and hand muscles. The stage is characterized by a decline in heart rate, body temperature and the decrease of the reduction which is usually performed by the reduced sweat about 5-15 minutes.

## E. Kind of Appropriate Sport for Elderly

### 1. Sports for Elderly

Basically, any exercise provided for elderly should be done in accordance with the portion and has been routinely performed since they were young. In terms of the age of the elderly, it has been much decreased in physiological sides and in terms of its biomotor components. Doctors suggest that elderly sport should be harmless, less physical contact and be dynamic like aerobic such as walking, aerobic exercises that are specifically for elderly, swimming or a combination of these gateball sports.

Some benefits of exercise for the elderly are to slow down the degeneration process due to changes in the elderly, to facilitate physical health in life that is protective, which is to improve reserved power when sick, (Suryanto, 2010).

## 2. Gateball Sport

Gateball is a new sport that is growing in Indonesia, the sport is much in demand because it leads to more recreational sports although many are also competed for achievement. This sport is dominated by many elderly because it does not require strength and accuracy that is the most dominant element. Gateball sport can be played by men and women even combined between men and women and it is not limited by age therefore gateball is also called sport without boundaries.

### a. The Game Rule

Sports gateball is a target sport with putting the ball into the gate or wicket. Gateball sport is played by two teams of red and white team in accordance with the ball being played. A team consists of 5 players, the red team consists of playing an odd ball number (1,3,5,7,9) while the white team plays even ball (2,4,6,8,10), to start the game by hitting the red team first ball and followed by the white team. This is a ball game targeted which is ball batted must pass 3 namely goal (goal 1 to 3) and is declared complete after about hitting goal ball pole.

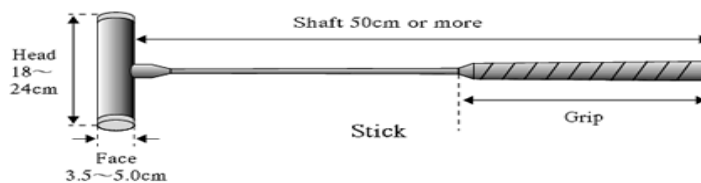
The winner is determined by the total amount earned during game time. Usually, the gateball game is 30 minutes. Each team consists of 5 core players with a substitution player, and one player acts as the captain of the team. The game begins by the holder of the red balls and white balls later and continued intermittently.

### b. Equipments

There are some equipments to play gateball; the stick, ball, wicket, goal pole, and the gateball field.

#### 1) The Stick

The stick is a T-shaped head as a hitter and as a place to grip the hit. The cylindrical head is with a length of 18-24 centimeters in diameter from 3.5 to 5 centimeters. While the stick rod is 50 centimeters or more in compatible length needs. No special material specifications are usually made of metal or wood.



Source: *Gateball.worldpress.com*

#### 2) Ball

Gateball ball is 7.5 inches diameter, weighed 230 grams and is made of synthetic resin. Gateball ball consists of 5 red balls and 5 white balls. Red for odd balls numbered 1, 3, 5, 7, 9 and even-numbered white balls 2, 4, 6, 8, 10.



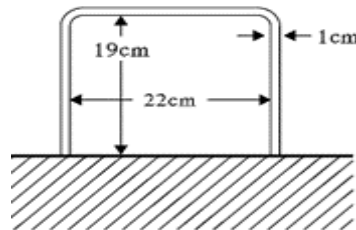
Sourcer: *Gateball.worldpress.com*

#### 3) Gate

Gateball game requires 3 gates consisting of a gate that is the first gate that must be passed by each participant to start the game. The second and the third gate are the goals that must be passed to obtain a point and goal pole to end the game.

Gateball winner is determined by a point system that is obtained by inserting the ball into the gates.

The gate is made of a cylindrical rod made of 1 centimeter diameter rod cylinder. U-shaped gate with a width of 22 centimeters and 19 centimeters high. Each gate is labeled according to the number of goal.

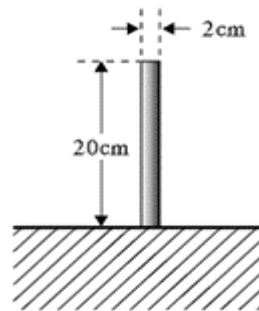


Gate

Source: *Gateball.worldpress.com*

#### 4) Goal pole

Goal pole is a pole that is placed amid which functions to end the match in addition to getting points. Goal pole is placed at the midpoint of the field. Goal pole is made of steel pipe with a diameter of 2 centimeters, plugged straight with 20 centimeters high. Goal pole color should contrast with the color of the field to be easily identified as the ultimate target.

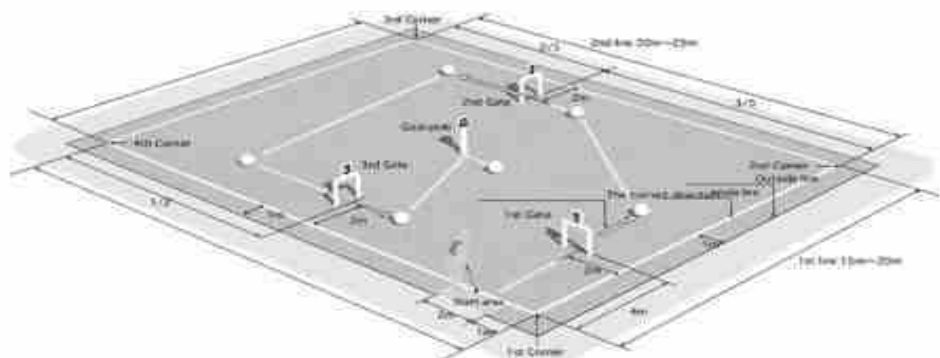


Goal-pole

Source: *Gateball.worldpress.com*

#### 5) Gateball Field

Gateball field is rectangular with a size of 20-25 meters with a width of 15-20 meters. Usually this sport is played in field ground like a grassy field or clay.



Source: *Gateball.worldpress.com*

6) Terms in Gateball

1) First Hit

The firsthit is to start the game through the start line. The ball must be entered at the first hit the gate and then can continue to the next gates. The ball is not allowed to enter the field when failing to pass the first gate.

2) *Outball*

It is said outball if the result of a hit out of the field lines. After the ball out, the ball should be included again after waiting until the ball is recalled.

3) *Touch dan sparking*

Touch is when the ball is hit by a player who touches the ball or the others, both friend and opponents alike ball. Sparking is a way of extracting and moving the ball, either beneficial or detrimental positions. How to do sparring is take our ball and stepped on the ball and place the ball in place attached to the ball touched us and point it to our intentions.

d. The Benefits of Gateball for Elderly

Many studies suggest that the exercise would have many benefits, especially for the elderly. Exercise is very beneficial for health and physical fitness. Some benefits of exercise is improving blood circulation, strengthen muscles, burn fats, improve muscle coordination and many others. However, sometimes the elderly feel bored to do exercise because of the same routine.

Gateball is a fun recreational sport, because gateball is a sport that requires strategy in the game. Gateball game is usually played for 30 minutes, so it will be plenty of time for physical fitness training, especially with regard to the health components.

Gateball can train endurance component of pulmonary heart because this game has a large field sizes so that players in this case is elderly will walk and run to catch the ball that has been hit in the field. Each player has the opportunity to do anything further hit when the ball goes into the gate or ball of the ball other friends and opponents alike, and so on. Players will unconsciously be always running to catch the ball and wait for the other players to stand next to the field to play the turn. Click Doctor (2014: 1) states that aerobic exercise means exercise for heart and lung health, in the form of body movement in general such as walking, aerobic exercise can be done for 30 minutes

Strength is the ability of muscles against a load in a single effort. In gateball game, because players can train strength, they will perform it repeatedly with full force if they need a hard blow and blow gently when the ball is in favorable positions. The game can also train gateball muscular endurance as players perform repeated blows alternately in accordance with the turns for 30 minutes.

Flexibility is the ability to move joints freely. Abidil Smith, (2013: 2) says that flexibility is the ability to move in all directions with movement amplitude (range of motion) is large and broadly in line with the function of movable joints. The game can train gateball flexibility because in each game the player makes a hit with a hard or soft with the joints as needed will adapt the body especially arms joints, and legs that are used as a footstool in making a hit. Gateball ball hit direction is adjusted to the needs to be intended not with the monotonous movements that its position is constantly changing according to the needs.

Body composition is the ratio of body weight in the form of fat to body weight which is stated in percentage of body fat percentage. Exercise should be done regularly at least three times a week and intermitten because the body will adapt. Exercise if done regularly of course can make the body expending energy

and calories and it will certainly have an impact on both body composition and weight loss in body fat.

From the explanations about gateball, there are many advantages to make playing gateball as a sport culture for elderly so that it will be more prepared by many ways:

1. Organize a Gateball Community

Gateball game is played as a team sport it cannot be played individually, thus, it requires other members. It needs to make a community of gateball lovers, in addition to the community play an exercise; it is also beneficial to exchange information. It would be better if gateball community is made up of the elderly to be a good communication, the same feeling of shared passion to stay healthy and fit. This community is not just about gateball but can provide other information, especially about health and physical fitness.

2. Make Regular Training Schedule

Once gateball community is formed, the next step is to make exercise in a regular schedule. To obtain a physical fitness, the exercise is performed at least three times a week. Gateball community in Bantul Regency plans the exercise once every two weeks because the next day is usually used to practice with other community or practice group, usually every day of the week or holidays. The exercise is determined by the business level and agreement of each participant.

3. Make Communication with Other Gateball Communities

After the community is formed and regular exercise goes well, make gateball community to other communications. This communication will be very useful to know the development of information communication gateball of others. Communication is also useful to add to the spirit of the exercise, especially the elderly, because of mutual willing between communities in different capabilities.

4. Make a Tournament for Gateball Communities

The peak of the exercise is a match. Matches are made to overcome boredom in practice. Match or championship are made also to see how the exercise effect that has been carried out on a daily basis. With the championship, it is also expected in elderly participants can measure the fitness level of each because the gateball game is constantly performed or completed within the time into as well. The match also serves to strengthen inter-community gateball.

## CONCLUSION

Advanced age or often called as elderly is not a disease, although it can cause various social issue impacts. The signs of the elderly are the reduced ability to work by five senses, organ disorders, psychological changes and the emergence of various diseases. The body function decline of elderly is nearly 50 % due to reduced activities. The decrease in the ability can be minimized to always keep the physical fitness and set healthy lifestyle.

In general, fitness is a question of physical fitness (physical fitness) the ability of a person doing daily work efficiently basis without incurring excessive fatigue so they can enjoy their leisure time . Good physical fitness will not be obtained without going through the planning and the understanding about good healthy lifestyle, there are three attempts to do to gain physical fitness; eating, exercise, and taking a rest.

Many studies suggest that the exercise have many benefits, especially for the elderly. Gateball is a good exercise for the elderly because it is a strategy sport that can affect the physical fitness. The use of this sport makes a culture to maintain physical fitness in a way: create a community for the exercise a routine, the routine determines training schedule, establish communication with other gateball community organizing regular matches with other communities. By playing together with the community, it does not only exchange information but also emerge confidence and spirit to stay healthy and fit.



## REFERENCE

- [1] Anggelinasinta. (2013). *Manfaat Tidur bagi Kesehatan Manusia*. Di akses pada 9 Januari 2013. [Anggelinasinta.blogspot.com/2013/01/manfaat-tidur-bagi-kesehatan-manusia.html](http://Anggelinasinta.blogspot.com/2013/01/manfaat-tidur-bagi-kesehatan-manusia.html)
- [2] Djoko Pekik. (2004). *Berolahraga untuk Kebugaran dan Kesehatan*. Yogyakarta: Andi  
Bali gateball Community. [Gateball.wordpress.com](http://Gateball.wordpress.com)
- [3] Dedi Aidil. (2013). *Kelenturan Olahraga*. Di akses Februari 2013. [Olahraga-sukses.blogspot.com](http://Olahraga-sukses.blogspot.com)
- [4] Giam CK, The KC (1993) *Ilmu Kedokteran Olahraga*. Jakarta: Bina Rupa Aksara
- [5] Ida Ayu. (2011). *Berolahraga untuk lansia*. Di unduh 11 September 2011. <http://www.balisruti.or.id/berolahraga-untuk-kebugaran-bagi-lansia.html>.
- [6] Klik Dokter. (2014) *Olahraga Penting untuk Lansia*. Di akses 03 April 2014 dalam [klikdokter.com/rubukspesialis/read/41/gayahidup/2013/07/02/343/olahraga-penting-untuk-lansia#.Uzz088j4sqU](http://klikdokter.com/rubukspesialis/read/41/gayahidup/2013/07/02/343/olahraga-penting-untuk-lansia#.Uzz088j4sqU).
- [7] Nieman DC. (1989) *The Sports Medecine Fitness Course*. California: Bull Publishing Company.
- [8] Suharjana. (2012). *Kebugaran Jasmani*. Program Studi S2 Ilmu Keolahragaan. Program Pascasarjana Universitas Negeri Yogyakarta.
- [9] Suryanto. (2010). *Pentingnya Olahraga Bagi Lansia*. Yogyakarta: Medikora, fakultas Ilmu Keolahragaan, Universitas Negeri Yogyakarta.
- [10] Yahmin. (2012). *Olahraga untuk Lansia*. Di unduh 22 Mei 2012. <http://www.lkc.or.id/2012/05/22/olahraga-untuk-lansia>.

# **SURVEY OF THE UNDERSTANDING LEVEL OF PHYSICAL EDUCATION TEACHERS TO DESIGN GAMES IN ELEMANTARY SCHOOLS IN MALANG**

**Febrita P. Heynoek<sup>1</sup>, Sri Purnami<sup>2</sup>, and Dona Sandy Y<sup>3</sup>**

**State University of Malang, Indonesia**

## **Abstract**

Physical education is education of and through movement. Physical education has two elements i.e games and sports. Elementary school is basic education to develop physically growth and motoric skills for students. Physical education on Elemantary should develop basic motor skills of students. Furthermore, teacher should have capability to create games for physical education lesson. Generally, the purpose of this research is to describe the level of teacher understanding to create games for physical education acquirement. The design of this study were categorized into descriptive, explorative. This study objectively describe the level of physical education teachers understanding in schools to designing games for learning physical education. The research design of this study were categorized into descriptive, explorative. The subjects in this study were physical education teachers who teach in elemantry that located in the city of Malang. The place of research in a primary school in Malang, while time research had been conducted from July to November 2013. Based on the results of this research describe that the understanding level of physical education teachers to design games obtained 52 percentage. It is included in good enough category. In particularly, over than 50 percentage games with balls and athletic are used by teachers. Then, majority teachers have a form games which used for teaching. Next, enhancing psychomotoric skills are one of the purpose of teaching by games. Finally, it is expected there are other researchers who conduct further observations by adding variables and indicators of questions and the number of samples tested in the study and comparison of the results with this study.

**Keywords:** teacher, physical education, games

## **INTRODUCTION**

Physical education is education of and through movement. There are three key words in this definition, 1) education, which is reflected by the competency achieved by students; 2 ) through and of , a conjunction that describes the relationship expressed by the associated direct and indirect and 3 ) movement (movement) , a study material (game activity, aquatic, rhythmic, etc. ) as shown in the physical education curriculum .

Physical education has both elements of play and sport , but not solely play and sport but a combination of both . Physical education is physical activity goal-oriented education, which is trying to educate activities through physical activity . However, the play and sports activities are not oriented educational purposes. This means that the use of physical education and sports play aspect that is applied in the lesson. The skills developed through a good physical education program are critical in ensuring that students have success in many of the sport and leisure activities common to the community.

Elementary School is an early education that can be used to develop physical growth and motor skills of student . At this stage, students have ranged in age from 7 to 12 years old who have the basic movement developments that are not too different. Basic principle of motor development in elemantary is locomotor, non- locomotor and manipulative ( Corbin ,1980) . In line with this opinion , Pate, Rotella and McClenaghan ( 1984:84 ) suggests that elementary school age children fall into the category of " pre-development skills " that the emphasis on basic movement patterns . The pattern of child's basic movement based on the movement phase

- reflective stage of development and sensory integration that has grown at an earlier age. Children learn how to do many things, including developing more advanced skills, outside an instructional environment. An appropriate learning approaches used in the teaching of physical education is games. Games are a significant component of the physical education curriculum, with research suggesting that 65 per cent or more of the time spent in physical education is allotted to games' (Werner, Thorpe & Bunker, 1996). Based on that statement, physical education teachers are required to have knowledge in designing games used in learning .

To have the knowledge about designing games that mastery -oriented movement (movement base and basic techniques) and the ability to play (tactics and strategy skills) then the teacher needs to have an understanding of designing a game. According to Hopper (1998) The process involves teaching children using a modified and simplified game that matches the physical, social and mental development of the students. While attempting to achieve high student participation rates through organised games, teachers must be vigilant to be sure that the focus of the games is on specific skill development.

The data in the teachers' level of understanding of designing games used in learning especially for elementary school children in the city of Malang is needed. It is because there is no data which can illustrate the physical education teachers used games in learning process. This data can be used as a design basis in an effort to improve the competence of elementary school physical education teacher at Malang city. The efforts should be made in improving the competence to continuously and sustainably. Based on the exposure in front of the data on teachers' level of understanding about designing learning games in physical education in primary schools is urgent effort to begin immediately. Through the data results of this research can be used as baseline data, especially for research in the field of physical education.

The objectives to be achieved in this study is to describe the level of understanding of physical education teachers to design games in elementary school, particularly, obtaining data of teacher skills to create modification games for physical education learning. Furthermore, the benefit of this research is provide a real picture of the learning process which is implemented by physical education teachers elementary school, where learning activities that are required to use a modified game.

## **RESEARCH METHOD**

The design of this study were categorized into descriptive, explorative. This study objectively describe the level of physical education teachers understanding in schools to designing games for learning physical education. This is also in accordance with what is stated by Sukardi (2003:163) study is a descriptive research method that is trying to portray the object or subject under study in accordance with what it is, with the aim of describing systematically the facts and characteristics of the object studied properly. The type of data in this study is qualitative interviews and quantitative data for dikjas teachers in schools.

Subjects in this study were subject teachers of physical education, sport and health primary schools located in the city of Malang. The place of research in a primary school in Malang, while time research was conducted in November 2013.

The instrument which is used of this research are interview guidelines and questioner. There was two types data i.e quantitive and qualitative. Quantitative data is data which have numerical characteristic. Meanwhile, qualitative data is data which is collected from interview process. The analysis data was determined as two analysis. First, percentage technique which was applied quantitative data. Second, reduction data was used for qualitative data.

## **RESEARCH RESULTS AND DISCUSSION**

The results of survey research on the level of understanding of teachers in designing learning games for physical education and sport in primary schools in the district Klojen Malang. Physical education (physical education) has both elements of play and exercise, but not solely play and exercise alone but a combination of both . With the name of physical education

physical activity goal-oriented education, which is trying to educate activities through physical activity. However, the play and sports activities are not oriented educational purposes. This means that the use of physical education and sports play aspect that is applied in the lesson.

In this study, the instrument used to obtain data in the form of a questionnaire . Questionnaire used in this study is a questionnaire mix. " Questionnaires are a number of written questions used to obtain information from respondents about something to be studied, Winarno (2007:62). " Questionnaire method used to obtain information from the requirements analysis Penjasorkes subject teachers of primary schools in the city of Malang . Arikunto ( 2002:128 ) explains that "the questionnaire or questionnaires are a number of written questions used to obtain information from respondents in terms of their personal statements, or things that he knows " . Questionnaire techniques have been deemed efficient and practical .

In accordance with the objectives of this research is to determine the level of understanding about the teachers in designing learning games for physical education in primary schools in the district Klojen of Malang. This study only describes the facts obtained from the questionnaire that was distributed to the respondents. The following discussion will describe the results of the study with reference to the answers and opinions of the respondents:

### **Characteristics of Respondents**

Based on the analysis of the majority of respondents ( 96 % ) had bachelor certificate and only 4 % of respondents graduated from Sport Education School (SGO). In qualifying Teacher, in District Klojen are qualified, so there is no difference in the level of education and background is too far behind. Percentage of results above, it can be concluded that the overall primary school teachers in the district Klojen the standard of education has met the qualification criteria set. This is in accordance with government regulations that a teacher must have a minimum educational qualification of equivalent level undergraduate.

For the period of employment of each teacher's evaluation shows that the highest number of respondents have a service life of 1-5 year, while the lowest amount each has a service life of 16 -20 years old and 31-35 years old . In accordance with the data found the average physical education subject teachers in elementary schools have a service life of the District Klojen under 10 years and only a few that already have a service life of over 15 years. It can be concluded that the working experiences of physical education elementary school teachers in the district Klojen still relatively not too high in experiences.

### **Understanding levels of teachers in the use of games for learning**

Based on the results of data analysis found that all elementary teachers in the district Klojen already using game activities in the learning process. This is indicated by data that 100% of PE teachers in elementary schools Klojen districts already using games methods in learning process. It is concluded that games have been used in learning process. As a demands of the curriculum of elementary stated that physical education applied learning activities by game. This approach is expected to improve all aspects of both the cognitive, affective and psychomotor .

Elementary school is an early education that can be used to develop physical growth and motor skills of students. This stage students have ranged in age from 7 to 12 years old have the basic movement developments that are not too different. Basic principle of movement developed in elementary is basic locomotor movements, non- locomotor and manipulative (Corbin, 1980). In line with this opinion, Pate, Rotella and McClenaghan ( 1984:84 ) suggests that elementary school age children fall into the category of "pre-development skills" that the emphasis on basic movement patterns. Appropriate learning approaches used in the teaching of physical education is playing approach.

### **The scope of the material taught in the learning activities**

The tendency of the use of games in learning by using the material in the scope of the game using small ball and big ball games, athletic with a percentage above 50 % . While the percentages below 50 % are in the scope of martial arts material, self-development activities,

activities gymnastics, rhythmic activities, aquatic activities, special education classes and healthy living culture. According to the percentage indicated that the scope of the material has the lowest percentage in martial arts, this suggests that in implementing the learning martial arts, respondents did not use the game .

It can be concluded that teacher tend to using games with tools. Besides that games activities that involving some of students usually easier to organized into the game on the learning process. Games that use a ball and field as well as other tools used will usually be more easily modified both in terms of the tools used, and the implementation rules for the game of learning activities. The level of student interest in the game is also high enough so that the conditioning class will be easier. To sum up, students are interesting on the learning process while implement games on it. Actually, this is a challenge for teachers to be able to find physical education alternation for the material becomes more attractive.

#### **The availability of the form of the game as a reference in physical education lessons**

The results showed that the majority of respondents have a format for designing the game and about 20 % of respondents do not have . The underlying reason for respondents who do not have the format of the game due to the difficulty in designing a game looking for material, it takes time to prepare the game , the game is done verbally so they do not have authentic evidence. Based on the above, it can be concluded that the average teacher already has a game form that will be applied in learning activities. Teachers certainly easier to implement and easier to make modifications to the game.

#### **Placement of using games in the learning stages of physical education**

The results of the study revealed that there was a tendency (70 %) games held by respondents in the pre impact stages of learning. This is because the introduction is a key activity in which to draw the attention of students in learning activities. When it is preceded by a fun activity then the game will be able to cause the enthusiasm of the students to follow the learning material . It can be concluded that the physical education teachers using attracted methods in the opening lesson activities to grab the attention of students to create a fun learning environment.

#### **Components in the game that is often applied by teachers**

In accordance with the results of the study explained that there is a high tendency of respondents to include psychomotor components, range of movement, purpose, physical aspects, the age of the students, the physical components and the tools and materials. Then there is the low tendency of respondents using cognitive, affective aspects and methods in designing games for learning. It can be concluded that teacher tend to enhance psychomotoric students by games.

#### **Component modifications and facilities and the use of certain infrastructures in the game is done by teachers**

The survey results showed that all respondents were used to modify the game in learning. Modified components are field size, tools, rules, types of skills are used and the number of players. It can be concluded from the above shows that the size of the field, equipment, rules, number of players have a high tendency to modify an essential component in learning the game .

In addition, the results also showed that 80% of respondents use the infrastructure specialized in designing games and 20% of respondents did not provide. The shape of the specific infrastructure used according to the characteristics of the game as the ball tailed, form field, the tools used, pictorial paper, cone, boxes and rope .

#### **Allocation of time spent at each meeting for conducting games**

Based on respondents answers showed that the highest percentage i.e 38 % of the respondents answered in the allocation of time needed to implement the game is 15 minutes . It can be concluded that the teacher does not use all the time in learning activities in the form of a game.

### **References used by teachers in designing game**

In accordance with the results of the study showed that there is a tendency of respondents get information about the game through Books / Dictates / Journal by 78 % , while the lowest percentage of 40% of game information obtained through the discussion KKG forum. It can be concluded that the book is still dominant for reference which is used by the teachers. No teacher who tried to find references from the internet or something based on IT. Some teachers also utilize KKG forum as a means to exchange ideas on learning activities are carried out.

### **Evaluation methods applied by teachers to measure learning outcomes**

Based on the results of the study indicate that there is a tendency of respondents use a skill test in data collection process in determining student learning outcomes through learning in the game. Selection of skill tests conducted by the teacher based on the subject matter being taught so as to measure the achievement of the desired goals. It can be concluded that the teacher penjas elementary schools in the District Klojen Malang still many who tend to use tool that tests other than skills test .

### **Training activities on the application of game in physical education lesson have been followed by teacher**

Based on the results of the study showed that 84% of respondents had never received training on the design of games for learning and 16 % of respondents said that they had received training. It can be concluded that the majority of teachers have not been following the training activities on approach to learning to play physical education held by some parties or other agencies.

## **CONCLUSION AND SUGGESTION**

### **CONCLUSION**

Generally, based on the results of the discussion and the purpose of this research is to determine the level of understanding penjas elementary teachers in designing games for learning penjas obtained 52.7%. Based on the classification according to percentage (Arikunto, 1998:246) that the percentage of 56 to 65% is included in the category of Good Enough. Therefore, the level of physical education teachers understanding to design games for learning in the district Klojen Malang is good.

In particularly, games have been used by teacher in learning process which was games using balls more interesting for student. Then, the average teacher already has a game form that will be applied in learning activities. Games held by teachers in the pre impact stages of learning and also teacher tend to enhance psychomotoric students by games. The components which are field size, tools, rules, types of skills and the number of players are used to modify games. Next, the teacher does not use all the time in learning activities in the form of a game. Mostly, teacher had never received training to design of games for learning. To enhance their understanding of games, teacher get information about the game through Books / Dictates / Journal.

### **SUGGESTION**

Having regard to the findings in this study, then at this moment I would like to convey the following suggestions:

1. Expected to provide additional or input for staff or teachers in elementary subjects penjas Malang in the responsibilities of the institution or school in an attempt education goals better.
2. To obtain better results, it is expected there are other researchers who conduct further observations by adding variables and indicators of questions and the number of samples tested in the study and comparison of the results with this study.

## REFERENCES

- (1) Annarino, A.A. Cowel. *Curriculum Theory And Design In Physical Education*. USA. CV. Mosby Company.1980.
- (2) Arikunto, S. *Prosedur Penelitian*. Jakarta: PT. Rineka Cipta. 2002.
- (3) Arikunto, S. *Prosedur Penelitian Suatu Pendekatan Praktik*. Yogyakarta: Rineka Cipta. 2006.
- (4) Arikunto, S. *Manajemen Penelitian*. Yogyakarta: Rineka Cipta. 2009.
- (5) Depdiknas. *Kurikulum Tingkat Satuan Pendidikan*. Jakarta : Departemen Pendidikan Nasional2006.
- (6) Ditjen Dikti. *Pusat Sumber Belajar, Laboratorium Work, Perpustakaan dan Fasilitas lain*, Modul Akta V, Jakarta: Ditjen Dikti. 1983.
- (7) Gagne, R.M. *The Condition Of Learning*. New York. Holt Reinhart and Winston1977.
- (8) Moleong, J. L. *Metodologi Penelitian Kualitatif*. Bandung: PT. Remaja Roeselamantaryakarya. 2005.
- (9) Singer, Robert N. *Motor Learning and Human Performance*. New York: Macmillan Publisher Co. Inc. 1980.
- (10) Siedentop, D. *Physical Education Introductory Analysis*. Dubuqua Iowa. Wm. C. Brown. 1980.
- (11) Sudijono, A. *Pengantar Evaluasi Pendidikan*. Jakarta: PT. Raja Grafindo Persada. 2005.
- (12) Sukardi. *Metodologi Penelitian Pendidikan*. Jakarta: Bumi Aksara. 2003.
- (13) Winarno, M.E. *Metodologi Penelitian Pendidikan Jasmani*. Malang: Laboratorium Jurusan Ilmu Keolahragaan Fakultas Ilmu Pendidikan Universitas Negeri Malang. 2005.
- (14) Wuest, D.A. and Bucher, C.A. *Foundation of Physical Educaton and Sport*, St. Louis: Mosby-Year Book, Inc. 1995.
- (15) Werner, P., Thorpe, R., & Bunker, D.. Teaching games for understanding: evolution of a model.*The Journal of Physical Education, Recreation & Dance*, 67(1), 28-33(1996)

# CHANGES IN BLOOD LACTIC ACID LEVELS AFTER ACTIVE, CORSTABILITY, AND PASSIVE RECOVERY

Hajar Danardono

Tunas Pembangunan University Surakarta, Indonesia

## Abstract

The purpose of this study are to find out: (1) The difference effect among of type active recovery, corstability, and passive, after maximum exercise toward decreased levels of lactic acid, (2) The difference changes of lactic acid levels among the students that have less than body mass index, normal, and more, after maximum exercise, (3) The interaction between the type of recovery and categories of body mass index (BMI) toward decreased levels of lactic acids. The research method that used was experiment method with the 3 x 3 factorial design. The research population was students of study program of sport Science, Faculty of Sport Science, Yogyakarta State University, who have less body mass index categories, normal, and more. The number of research sample was 45 male students taken with purposive random sampling technique. The result of research indicate that : (1) There is significant difference effect among the type of active recovery, corstability, and passive, after maximum Exercise toward decreased levels of lactic acid, (Sig = 0.000 <0.05), effect of type active recovery better than the recovery corstability, and passive toward lactic acid levels reduction/change. (2) There is significant difference of lactic acid levels reduction/change among the students that have body mass index less than, normal, and more, (Sig = 0.000 <0.05), students group with normal body mass index category have larger lactic acid levels reduction/change than students group with body mass index less, and more. (3) There is no significant interaction between the type of recovery and BMI categories on decreased levels of lactic acid/reduction, male students of Study Program of Sport Science, Faculty of Sport Science, Yogyakarta State University, (Sig = 0.113 > 0.05).

**Key Word:** Recovery, Maximum Exercise, Lactic Acid Levels, and Body Mass Index (BMI).

## INTRODUCTION

Exercise is very beneficial for health. By exercising the body's metabolism to be smooth so that the distribution and absorption of nutrients in the body to become more effective and efficient. Exercise is a necessity in our lives, especially for those who want to improve their health. Most people exercise to get the benefits of their training: like sport for performance enhancement, sports for increasing performance, better endurance, decreasing body fat, added and even just feel better. In order to maintain a regular exercise is essential for a full recovery after exercises. In order to maintain a regular exercise is very important for a full recovery after exercises. Recovery is an important part of a workout routine. This thing enables the athlete to train more often and train harder so that the athletes get more out of their trainings (Muhammad Arief Setiawan, 2012).

The process that occurs during recovery from some a physical exercise (exercise) is as important as the physical exercises process itself. Incomplete recovery between one exercise with other physical exercises or between one game to the next game in the end will reduce a person's physical performance (Ilhamjaya, 2000).

In the case of athletes, often only a day or 2 day breaks between one competition to another competition. Actually, is not an uncommon for athletes to participate in multiple competitions in a week or a few shows in a day, especially during the tournament time. The issue is how the coaches athletes can recover them completely and immediately from one performance to the next performance (Ilhamjaya, 2000).



The concept most closely relation to the recovery of a physical exercises (exercise) is debt oxygen (the oxygen debt). In addition, there are several other important things in the recovery process, namely: backup recovery fosfagen muscle, myoglobin with oxygen replenishment, replenishment of muscle glycogen reserves, and the destruction of the blood and muscle lactic acid (Fox, Bower & Foss, 1993).

The human body normally metabolized energy which source of one's body movements derived from ATP which is used among other things for the movement of muscles (Guyton, 1986).

The energy used during the move to anaerobic conditions will produce byproducts such as lactic acid. Lactic acid is normally present in the body and describes the condition of anaerobic glycolysis. Lactic acid is closely related to the ability of the muscle to contract. The body has limited the amount of lactic acid and tolerate each individual has a lactic acid threshold different. Lactic acid levels will increase during the move where the source energy is derived from anaerobic glycolysis system (Samson Bahri, Tommy Apriantono, Joseph Sigit, Serlyana Herman, 2007).

Lactic acid is formed through anaerobic glycolysis will decrease the pH (increasing acidity) in muscle and blood. This decrease in pH will inhibit the action of enzymes or chemical reactions in the cells of the body, especially in the muscle cells, causing muscle contractions eventually grow weak and in the end will get fatigue (Ilhamjaya, 2000).

The existence of high activity without regarding sufficient recovery times, can cause a buildup of lactic acid which lead to obstruction of blood intake of energy aerobic system in muscle cells and the onset of fatigue (Guyton, 1986). These conditions resulted in a reducing muscle performance. However, the existence of lactic acid in the body is also important because lactic acid can be converted into an energy source. Lactic acids under conditions sufficient oxygen can be converted back into pyruvic acid and subsequently undergo oxidative system to generate energy.

Lactic acid is an indicator of fatigue, which is a byproduct of the metabolism of energy formation. In our body, there is a chemical process that converts chemical energy into mechanical energy in the food that makes our muscles to contract. Mechanical energy that makes muscles contract derived from a molecule called ATP (Adenosine Tri Phosphate, a group that binds adenosine three phosphate groups). If a phosphate group from ATP loose, then the energy of 30 kJ will be released. One of the energy usage, namely to move muscle (Bahri Samson, Tommy Apriantono, Joseph Sigit, Serlyana Herman, 2009).

in some sports, such as weight gain body fat can actually inhibit the movement of athletes . Examples of athletes who do not need the weight is high jumper, long jump, ballerina, gymnastics, fast and marathon runners. Body fat will only increase the athlete's body weight but does not contribute to the production of energy. Thus, excessive body fat will interfere with the body as it moves. Added weight will usually be in line with the increase in body fat. Losing excess fat will not affect the total VO<sub>2</sub>max but will increase when converted in millimeters per kilogram of body weight (Fatmah , 2011). So someone who has more weight tend to not fit because a lot of fat in the body will caused less agile in movement so as to recovery requires a longer time , as well as skinny people , tend not to fit because many short of energy / nutrient intake so as to restore in sporting activities is also a bit long.

Mechanisms recovery of muscle and blood lactate are affected by the activities undertaken after activity with maximum intensity. This thing will affect the mechanism of the release of lactate from the blood to the muscles, increasing blood flow, lactate uptake by the liver, heart, and skeletal muscle. Speed expenditure of muscle lactate into the blood vessels will affect on the next subsequent metabolic processes, so that lactate can immediately re-establish energy metabolized via the Krebs cycle (Widiyanto, 2012). According to Santoso Giriwijoyo & Dikdik Zafar (2012) aerobic process is one way to eliminate fatigue substances, because during the process of aerobic blood stream can flow to the brain and heart, respiration process went smoothly, which causes a lot of incoming oxygen to the body so quickly forming energy back.

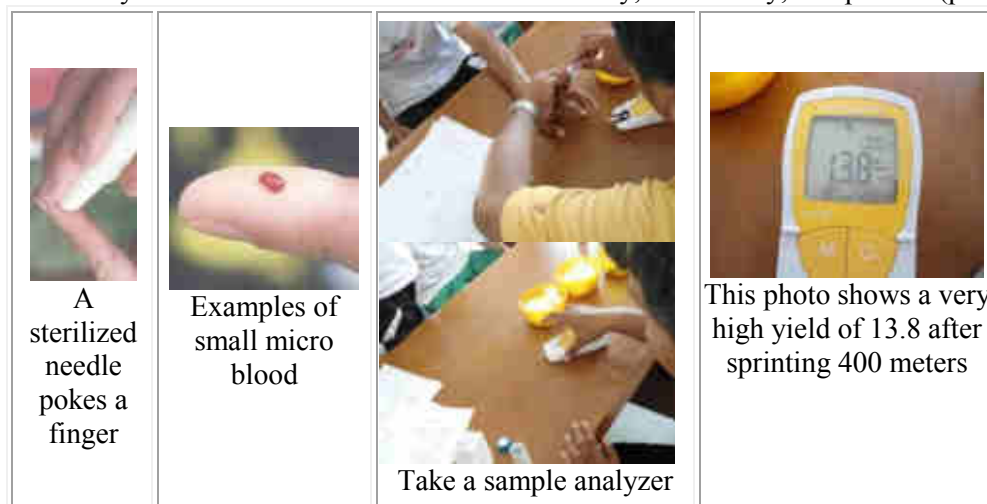
Optimizing the recovery period in line with theoretical studies which state that a person is not only physiological conditioning during exercise but also during the recovery exercise, game time, and the recovery time between matches. Optimization kind of recovery is important to do considering the quality of a good recovery can reduce fatigue, both objective and subjective, and can reduce injury (Widiyanto, 2012). On this occasion the researchers will compare the recovery active techniques, corstability, and passive with the Body Mass Index that expected can support for improving the decreased levels of lactic acid. With the increasing reduction in lactic acid levels are expected to contribute on the efficiency of recovery and can find the resistance training and preparing athletes for competition, even during the competition process.

## METHOD

The kind of this research to be carried out is kind of experimental laboratories and field researches, design used in this study is a 3 x 3 factorial design. According Sudjana (2002) experiment factorial design is experimental that almost or all levels of a factor combined or crossed with each level and all other factors in the experimental. In the 3 x 3 plan factorial is described about factorial experiment that measured not only the influence of the main factors each independent variable on the dependent variable, but also the effect of the interaction between the independent variables. The results are taken from a second treatment (acute response). This research was conducted at the Faculty of Sport Athletic Stadium, Yogyakarta State University.

The population in this research were students in the IKORA FIK UNY study programs. Sample was 45 male students were taken by purposive random sampling technique. The samples were divided into three group, each group consists of 15 people. The group is ( 1 ) The group of people who have a body mass index over untreated active recovery, corstability, and passive. ( 2 ) The group of people who have normal body mass index were treated active recovery, corstability, and passive. (3) The group of people who have a body mass index less active untreated recovery, corstability, and passive. The dependent variable in this research is the blood lactic acid levels. In the implementation using a Lacto Test instrument for measuring blood lactic acid levels, scales to measure weight, stadiometer for measuring height and athletic stadium for the overall execution ranging from pre-test to run 400 m , with recovery treatments. Statistical analysis techniques used in this study is a two-lane ANOVA with the help of computer applications using a series of SPSS for Windows version 19 with a 5% significance level.

Lactate data's got after people try to do the 400-meter (pre-test) and after treatment in the form of recovery for 20 minutes either with active recovery, corstability, and passive (post-test).



## RESULTS

### Description of Data

Description of Data Measurement results of blood lactic acid levels in students who have a Body Mass Index More, Normal, and less by the type of recovery is active recovery, corstability, and passive.

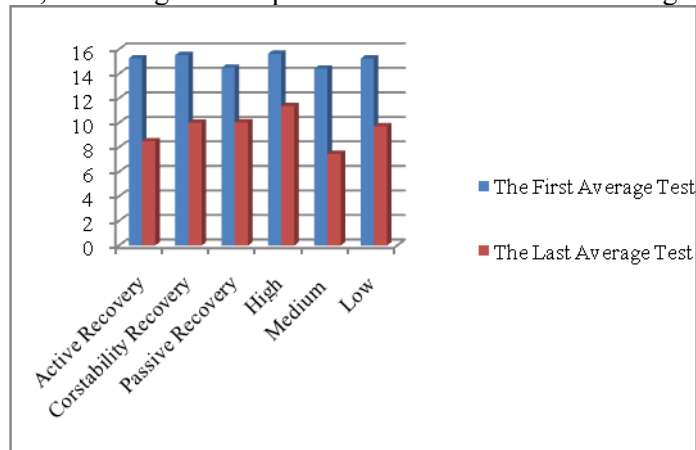
Treatment	Body Mass Index (BMI)	Statistics	The First Test Result	The Last Test Result	CHANGES IN BLOOD LACTIC ACID LEVELS
<i>Active Recovery</i>	More	Sum	87.1	59.6	27.5
		Average	17.42	11.92	5.5
		SD	2.324	1.898	1.178
	Normal	Sum	69.4	24.9	44.5
		Average	13.88	4.98	8.9
		SD	1.243	0.746	0.836
	Less	Sum	72.4	43.1	29.3
		Average	14.48	8.62	5.86
		SD	1.515	1.585	1.004
<i>Corstability Recovery</i>	More	Sum	77.2	55.6	21.6
		Average	15.44	11.12	4.32
		SD	2.406	1.876	1.235
	Normal	Sum	76.4	42.7	33.7
		Average	15.28	8.54	6.74
		SD	0.567	0.873	0.689
	Less	Sum	79.4	51.7	27.7
		Average	15.88	10.34	5.54
		SD	0.775	0.989	0.484
<i>Passive Recovery</i>	More	Sum	70.2	55.3	14.9
		Average	14.04	11.06	2.98
		SD	2.046	2.006	0.574
	Normal	Sum	70.5	44.3	26.2
		Average	14.1	8.86	5.24
		SD	1.104	1.458	1.978
	Less	Sum	76.8	50.9	25.9
		Average	15.36	10.18	5.18
		SD	0.943	1.148	0.904

The things that got the attention of the values contained in the table above are as follows:

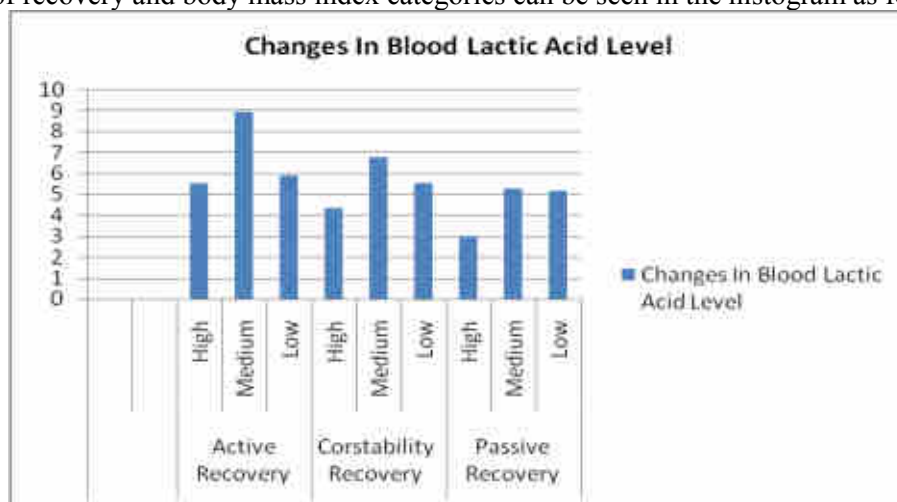
1. In the group treatment active recovery had an average initial test and final test 8:50 15:26 to average 6.75 change in the levels of lactic acid. In the treatment group the average recovery corstability had initial test and final test 10:00 15:53 with an average change in the levels of lactic acid 5:53. and passive recovery In the treatment group had an average initial test and final test 10:03 14:50 with an average change in the levels of lactic acid 4:46. When the three treatments were compared to the average change in the levels of lactic acid in the treatment of active recovery is better than treatment corstability recovery and passive recovery, then recovery corstability treatment is better than passive recovery.
2. Treatment groups in subjects who have a body mass index had an average initial test and final test 15.63 11:36 to 4:26 lactic acid levels change. Treatment groups in subjects who had a normal body mass index had an average initial test and final test 7:46 14:42 with changes in the levels of lactic acid 6.99. And group treatment in subjects who have a body mass index

less had an average initial test and final test 9.71 15:24 to 5:52 lactic acid levels change. When all three treatment groups were compared to the subjects who had a normal body mass index have a better changes than in subjects who have a body mass index of thin and more, then subjects who have a body mass index skinny is better than in subjects who have a body mass index.

3. To obtain a complete picture of the value of the average change in lactic acid levels for each of the main factors research, comparisons need to be made the comparisons. each cell (treatment group) have a different transformational levels of lactic acid. The average value of changes in lactic acid levels were achieved for each treatment group are presented in the form of a histogram. The overall picture of the value of the average percentage of lactic acid levels, the histogram comparison can be made the following values:



An overview of the value changes in the levels of lactic acid in each group based on the type of recovery and body mass index categories can be seen in the histogram as follows:



Group of students who received active recovery treatment, recovery corstability, and passive recovery have changes / decreases in lactic acid levels are different. If the group of students who received active recovery treatment, recovery corstability, and passive recovery compared, it can be seen that the recovery of active treatment group had a changes / decreases in lactic acid levels at 6.75 which is greater than the group corstability recovery and passive recovery.

Different categories of body mass index (BMI) affected on the changes / decreases in lactic acid levels. If the group of students who have a categories of body mass index, normal, and less than, it can be seen that the group of students who had a normal body mass index

categories have decreased levels of lactic acid was 6.99 which is larger than the group of students who have a body mass index less and more.

### Hypothesis Testing

Research hypothesis is based on the analysis of data and interpretation of analysis of variance. The results of the data analysis, which is needed to test the hypothesis as follows:

Table Summary of Results of Two-Factor Analysis of Variance

Variation Sources	DF	SS	MS	F	Sig
Average Treatment					
A	2	1457.851	485.950	336.479	0.000
B	2	39.275	19.638	13.597	0.000
AB	4	11.632	1.444		0.113
Error	36				
Total	44	1560.750			

### Hypothesis Testing I

The results showed that active recovery may provide changes / decreases in lactic acid levels are different from corstability and passive recovery. This is evidenced from the Sig = 0.000 > 0.05. Thus the null hypothesis ( H0 ) is rejected. Which means there is a significant difference between active recovery, corstability, and passive to change / decreases in lactic acid levels. From further analysis found that active recovery turns out to have a change / decrease in lactic acid levels better than corstability and passive recovery, with an average change / decrease in lactic acid levels, respectively, namely 5.5 , 8.9 and 5.86.

### Hypothesis Testing II

The results showed that students who had a normal body mass index category have changes / decreases in lactic acid levels are different from the students who have a body mass index of less and more. This is evidenced from the Sig = 0.000 > 0.05. Thus the null hypothesis (H0) is rejected. Which mean there is a change / decreases in lactic acid level were significantly between student who have a body mass index, normal, and less.

Obtained from further analysis that turns out to students who have a normal body mass index had a changes / decreases in lactic acid levels better than the students who have a body mass index of less and more, with an average change / decrease in lactic acid levels, respectively, namely 8.9 , 6.74 , and 5:24.

### Hypothesis Testing III

The results showed that the interaction between the type of recovery and BMI categories are not meaningful. Because the Sig = 0.113 > 0.05 level. thus the null hypothesis is accepted , which means there is no significant interaction between the type of recovery and BMI categories to change / decrease in lactic acid levels.

## DISCUSSION

Discussion of the results of this researches provide further interpretation of the results of data analysis has been presented. Based on hypothesis testing has resulted in two groups of analysis conclusions are: ( a ) there is a significant difference between the effect of the research factors ( b ) there was no significant interaction between the main factors in the form of two-factor interactions. Group analysis conclusion can be further described as follows:

1. The difference between the treatment effect of active recovery, corstability, and passive to change / decrease in lactic acid levels.

By testing the first hypothesis turns out there is a real difference in effect between groups of students who received active treatment recovery, corstability, and passive towards

decreased levels of lactic acid. Effect of active recovery treatment has a reduced lactate greater than the treatment corstability and passive recovery. Corstability recovery treatment has a reduced lactate greater than that of passive recovery. Treatment of passive recovery has the least reduction in lactate.

At recovery time, the muscle will release lactate into the blood circulation to be brought to the network or to a less active muscle. Most muscle lactate will be cleared through the circulation, while others are converted back to pyruvate to form glycogen back with the support of the enzyme pyruvate dehydrogenase. Most of pyruvate will be oxidized to carbon dioxide and water, while others changed to alanine (Widiyanto, 2012).

Aerobic lactate oxidation is a major part in the process of change / decrease in lactate. The existence of differences in the decrease in lactate during recovery caused by the difference in the oxidation rate, which is influenced by the shape and load recovery.

Brooks in widiyanto (2012) argues that with regard to lactate, physical activity using the aerobic system will not be excessive lactate buildup, due to the oxidation of lactate production in balance. In addition to the muscles produce lactate, muscle also consume (use) lactate as a source of energy through aerobic oxidation process, but at the time of physical activity increased until the anaerobic threshold occurs imbalance between lactate and lactate produced were used. He also explained that at the time of exercise above anaerobic threshold (maximum up to super maximum) mechanism " lactate shuttle " (lactate shuttle) means that lactate produced by one muscle will be released and captured by other muscles that are not running normally (disturbed), resulting in the accumulation of lactate in muscle. Lactate shuttle will return to normal in a recovery or a decrease in the intensity of physical activity, (Brooks in widiyanto, 2012).

Hence, active recovery treatment has better outcomes than passive recovery in lowering corstability and lactic acid levels. Active recovery / moderate exercise are a very effective remedy to reduce levels of lactic acid.

From the figures generated in the analysis of the data shows that the average ratio decreased levels of lactic acid produced by active recovery is 6.75 greater than with corstability and passive recovery. corstability average recovery decreased levels of lactic acid produced is 5.53 greater than passive recovery. Passive recovery on average decreased levels of lactic acid produced is 4.46 or the least.

2. Differences change / decrease in lactic acid levels between which has a body mass index, normal, and less.

Based on hypothesis testing to two turns out there is a real difference in effect between groups of students with a body mass index categories, normal, and less towards decreased levels of lactic acid . Students who have a normal body mass index category had a reduced lactate greater than students who have less body mass index categories and more. Students who have less body mass index categories have a big decrease reduction in lactate greater than students who have excess body mass index. Students who have a body mass index had the least decrease in lactate.

Added weight will usually be in line with the increase in body fat. Losing excess fat will not affect the total VO2 Max but will increase when converted in millimeters per kilogram of body weight. Weight gain in the form of body fat can actually inhibit the movement of a persons, body fat will only increase the weight of one's body but does not contribute to the production of energy. So excessive body fat will interfere with the body as it moves (Fatmah, 2011). In contrast to those who were underweight (malnutrition), the availability of nutrients in the body will affect the ability of muscles to contract and cardiovascular endurance. To get a good fitness exercise people must perform sufficient and have adequate nutrition for physical activity (Fatmah , 2010).

In the group of students with a normal body mass index category has a greater potential than the students who have less body mass index categories and more. Students with a normal body mass index category has the status of Max fitness/VO2 better than

students with less body mass index categories and more . Health Status / VO2 Max are better enabled to have a change / decrease greater, this was due to an increase in the capacity of pulmonary respiration and heart rate, oxygen supply can be satisfied than those who have poor Max fitness/VO2 status. Therefore students who have a normal body mass index categories have decreased levels of lactic acid greater, than the students who have less body mass index categories and more.

From the figures generated in the analysis of the data shows that the average ratio decreased levels of lactic acid in the category of students who have a normal body mass index greater than 6.99 on a group of students who have a body mass index of less and more. Average decrease in lactic acid levels in the category of students who have a body mass index less 5:52, larger than body mass index. the average decrease in lactic acid levels in students who have a normal body mass index category 4:26 , or the least.

3. The influence of the interaction between the kind of recovery and body mass index category to change / decrease in lactic acid levels.

From the summary table of the results of the analysis of variance of two factors, it appears that the major factors in the form of two- factor study showed no interaction. The results showed that the interaction between the type of recovery and BMI categories are not meaningful. It is evident from the sig accepted at  $\alpha = 0.05$ . This can be proved by the results of the calculation of variance analysis 2 factors, Sig = 0.113 > 0.05 level.

These conditions provide a picture that changes in the levels of lactic acid in the body mass index groups, normal, and less have the same value (third best when treated with active recovery). these is in accordance with the research results achieved, which can be explained as follows:

- a. Group of students who have a body mass index categories have decreased levels of lactic acid which is great if untreated active recovery , if recovery corstability treated have a reduced lactate less than active recovery but when compared to passive recovery greater recovery when treated corstability. Passive recovery has the least reduction in lactate.
- b. Group of students who have a normal body mass index categories have decreased levels of lactic acid which is great if untreated active recovery , if recovery corstability treated have a reduced lactate less than active recovery but when compared to passive recovery greater recovery when treated corstability. Passive recovery has the least reduction in lactate.
- c. Group of students who have a body mass index categories have less reduction in lactic acid levels were greater if treated active recovery, if recovery corstability treated have a reduced lactate less than active recovery but when compared to passive recovery greater recovery when treated corstability. Passive recovery has the least reduction in lactate.

## CONCLUSIONS AND RECOMMENDATIONS

### CONCLUSIONS

1. There is a significant difference between the treatment of active recovery, corstability, and passive towards decreased levels of lactic acid. Effect of active recovery treatment had a reduced lactate greater than the treatment corstability and passive recovery. Corstability recovery treatment had a reduced lactate greater than that of passive recovery. Treatment of passive recovery has the least reduction in lactate.
2. There are differences in lactic acid levels decrease significantly between categories of students who have a body mass index (BMI) is more normal and less. Students who have a normal body mass index category had a reduced lactate greater than students who have less body mass index categories and more. Students who have less body mass index categories have greater reduction in lactate than students who have excess body mass index. Students who have a body mass index had the least decrease in lactate.

3. There was no significant interaction between the type of recovery and body mass index category to decreased levels of lactic acid.
  - a. Group of students who have a body mass index categories have decreased levels of lactic acid which is great if untreated active recovery, if recovery corstability treated have a reduced lactate less than active recovery but when compared to passive recovery greater recovery when treated corstability. Passive recovery has the least reduction in lactate.
  - b. Group of students who have a normal body mass index categories have decreased levels of lactic acid which is great if untreated active recovery, if recovery corstability treated have a reduced lactate less than active recovery but when compared to passive recovery greater recovery when treated corstability. Passive recovery has the least reduction in lactate.
  - c. Group of students who have a body mass index categories have less reduction in lactic acid levels were greater if treated active recovery, if recovery corstability treated have a reduced lactate less than active recovery but when compared to passive recovery greater recovery when treated corstability. Passive recovery has the least reduction in lactate.

### RECOMMENDATIONS

1. Similar studies need to compare the fitness status, VO2 Max, gender, age, and measurement stages.
2. Need a similar study using a sample after the match (EG; football, basketball, tennis, and badminton).
3. To gain wider benefits, then for future researchers could extend this research, for example by adding another variable that is related to the development of athlete's physiological capabilities.
4. For the perfection of these results, then this research need tested on the subject of sport involving physical elements of the other, so this study has significant implications on the sport.

### BIBLIOGRAPHY

- Fatmah. (2011). *Gizi Kebugaran dan Olahraga*. Bandung: Lubuk Agung.
- Fox, Edward L, Bowers, Richard W., and Foss, Merle L. (1993). *The Physiological Basis For Exercises and Sport*. Iowa:Madison Winconsin Dubuque.
- Guyton, A. C., (1986). *Textbook of Medical Physiology*, 7<sup>th</sup> ed., Terjemahan E. Pakaryaningsih, Jakarta: Penerbit Buku Kedokteran EGC.
- Ilhamjaya Patellongi. (2000). *Fisiologi Olahraga*. Makasar: Fakultas Kedokteran Universitas Hasanudin.
- Muhammad Arief Setiawan. tersedia dalam <http://ariefsetiawan80.blogspot.com>. Akses 15 Desember 2012.
- Samsul Bahri, Tommy Apriantono, Joseph Sigit, Serlyana Herman. *Jurnal Iptek Olahraga*, VOL.9, No.2, Mei-Agustus 2007: 113 –123.
- Samsul Bahri, Tommy Apriantono, Joseph Sigit, Serlyana Herman. *Jurnal Iptek Olahraga*, VOL.11, No.1, Januari 2009: 59–74
- Santoso Giriwijoyo dan Dikdik Z. (2012). *Ilmu Faal Olahraga (Fisiologi Olahraga)*. Bandung: Pt Remaja Rosdakarya.



Sudjana. (2002). Desain dan Analisis Eksperimen. Bandung : Tarsito.

Widiyanto. (2012). Oksigen hiperbarik dan recovery aktif untuk meningkatkan clearance laktat dan stabilitas performa anaerobik "Disertasi". Surabaya : PPs Unesa.

# THE ROLE OF BRANCHED CHAIN AMINO ACIDS AS DIETARY SPORTS SUPPLEMENTS

I Made Satyawana<sup>1</sup> and I Wayan Artanayasa<sup>2</sup>

Ganesha Education University, Indonesia  
anduksatya@yahoo.com

## Abstract

Becoming an elite athlete requires good genes, good training, good conditioning and a sensible diet. Optimal nutrition is essential for peak performance. Protein supplements have been recommended to athletes to enhance nitrogen retention and increase muscle mass, to prevent protein catabolism during prolonged exercise, to promote muscle glycogen resynthesis following exercise, and to prevent sports anemia by promoting an increased synthesis of hemoglobin, myoglobin, oxidative enzymes, and mitochondria during aerobic training. The BCAA's have the greatest metabolic potential for energy use in muscle. The requirement for protein may actually be higher in endurance athletes than in sedentary individuals because some amino acids, including the BCAAs, are oxidized in increased amounts during exercise compared with rest, and they must therefore be replenished by the diet. Protein requirements are higher in very active individuals and suggested that resistance athletes need 1.6-1.7 g protein/kg body weight while endurance athletes need approximately 1.2-1.4 g protein/kg, values that are about 150-200 percent of the current United States Recommended Dietary Allowances (RDA). Hypothetically, BCAA supplementation may delay central nervous system fatigue and enhance performance in prolonged aerobic endurance events by increasing the BCAA: Tryptophan ratio and mitigating the formation of serotonin. Keep BCAA's intakes is an important things during sports endurance to reduce fatigue and get the peak performance on athletes.

**Keywords :** branched chain amino acids; sports; supplements

## INTRODUCTION

Exercise can improve achievement and prestige of a nation. To enhance sports performance, good physical health is necessary for the athlete. For coaches and athletes nutrition is often a complicated struggle. To instruct athletes on how to properly fuel themselves can be difficult. Many factors affect the physical things that athletes such as nutrition knowledge of athletes, nutrient intake and nutritional status of athletes. Thus, efforts to obtain high-quality athletes in the sport can be achieved. Exercise also may increase the athlete's need for protein. (Gaspar,2010; Mustamin,2010).

Becoming an elite athlete requires good genes, good training and conditioning and assensible diet. Optimal nutrition is essential for peak performance. Nutritional misinformation can do as much harm to the ambitious athlete as good nutrition can help. (Gaspar,2010; J.Anderson,2010).

Protein is very important in the maintenance and development of muscle tissue. Proteins are crucial in the production of key enzymes, antibodies, and hormones. Proteins also regulate the water levels of cells and repair the cell's damage. Protein can replace carbohydrate and fat as source of energy for us.(Gaspar,2010; Mustamin,2010).

### Protein or Amino Acids

Protein is on the most important nutrients and has a wide variety of physiological functions that are imperative to physical performance. Muscle tissue is crucial to athletic ability and proteins are important in the development of that muscle tissue. There are 20 amino acids which can be combined to make up all the different types of protein needed for building and structure of the body. There are two types of amino acids; essential amino acids, that cannot be manufactured in the body and nonessential amino acids, those that can. Those foods that contain

adequate amount of the nine essential amino acids used to support life and growth are known as complete proteins. The second, incomplete proteins have a deficiency in one or more amino acid and are unable to support life or growth. Animal protein is generally of a higher quality than that found in plants. Common sources of protein include animal foods in the milk and meat groups which generally have good sources of high quality protein. One glass of milk or 1 (ounce) of meat poultry or fish contains about 7-8 grams of protein. One egg contains about 6 grams of high quality protein (Gaspar,2010)

A 2004 review concluded that athletes, even those in strength sports, should follow the same recommendations as the general public approximately 12%-15% of calories from protein, adjusting only total calories based on physical activity.(Fuhrman,2010)

Hammer Nutrition (2001) recommend a combination of both soy and whey protein, used at separate times, to provide the most comprehensive support for an endurance athlete's diet. Whey protein is the primer protein for recovery and enhanced immune system function. While soy protein is ideal for fulfilling protein requirements prior to and during endurance exercise.

After carbohydrates and fats, protein provides energy for the body. Exercise may increase an athlete's need for protein, depending on the type and frequency of exercise. Extra protein consumed is stored as fat. In the fully grown athlete, it is training that builds muscle, not protein per se. The American Dietetic Association reports that a protein intake of 10 to 12 percent of total calories is sufficient. Most authorities recommend that endurance athletes eat between 1.2-1.4 grams protein per kg of body weight per day; resistance and strength-trained athletes may need as much as 1.6-1.7 grams protein per kg of body weight. (A kilogram equals 2.2 pounds) (J.Anderson,2010).

Athletes indeed do require a greater quantity of protein than sedentary individuals; however, the amount of protein required has been a point of confusion and disagreement among both athletes and the scientific community. Because protein may comprise 5% of the energy burned during exercise, positive nitrogen balance is needed as raw material for anabolic processes to replace these losses and/or build additional muscle mass. Insufficient protein ingestion leads to negative nitrogen balance and insufficient recovery. (Fuhrman,2010)

Japanese researchers demonstrated that "sports anemia" may appear in the early stages of training with intakes of less than 1 gram/kg of body weight per day of high quality protein. To calculate your protein needs, divide your ideal weight by 2.2 pounds to obtain your weight in kilograms. Then multiply kilograms by the grams of protein recommended. A varied diet will provide more than enough protein as caloric intake increases. Furthermore, Americans tend to eat more than the recommended amounts of protein. Excess protein can deprive the athlete of more efficient fuel and can lead to dehydration. High-protein diets increase the water requirement necessary to eliminate the nitrogen through the urine. Also, an increase in metabolic rate can occur and, therefore, increased oxygen consumption. Protein supplements are unnecessary and not recommended. (J.Anderson,2010, Syafrizar,2011)

High Protein diets are used by many athletes for various reasons such as weight training to gain weight or in strenuous exercise to maintain or increase protein balance. To achieve this, many athletes use both protein supplements. These supplements can be a convenient source of protein and many of these products contain high quality protein. The major drawback of commercial supplements is that they do not contain the natural nutrients such as those found in milk or eggs. Research on this topic discusses many different types of proteins and the advantages in regards to the uses previously discussed above. For those athletes interested in using protein supplementation, most research recommends that the supplement not be used in place of natural protein, but along with natural sources of proteins. It's key to understand that dietary deficiencies and excess will have an effect on the body's performance and efficiency.(Gaspar,2010). Otherwise, there is no demonstrated benefit for an athlete to consume more than 2 g protein, and in fact, excess protein may affect negatively calcium stores, kidney function, bone health, and cardiovascular health. (Fuhrman,2010)

However, dietary protein is composed of 20 different amino acids which, if ingested individually, have been theorized to possess ergogenic potential and have been marketed as sports supplements to physically active individuals. Indeed, amino acids are among the top five most popular sports supplements.(Gaspar,2010).

### **Branched Chain Amino Acids as Sports Supplements**

During exercise, there is increased protein oxidation and breakdown, followed by enhanced muscle protein synthesis and further protein breakdown during recovery. The rise in circulating amino acids after a protein-containing meal stimulates intramuscular protein synthesis and also slightly suppresses muscle protein breakdown. Ingesting carbohydrate alone fails to induce this increase in muscle protein synthesis. Similarly, benefits to immunity, muscle soreness, and overall health by protein containing meals compared with carbohydrate-only meals have been suggested in the literature. For these reasons, timing of content of protein in meals may be an important factor in recovery and muscle mass maintenance and gain. Specifically, branched chain amino acid (BCAA) supplements (isoleucine, leucine, and valine in approximate 1:2:1 ratio) are often considered to be most important. It has been studied for their effects on performance, muscle protein synthesis, and recovery. The branched chain amino acids make up 40% of the daily requirements of essential amino acids (Fuhrman,2010). Branched chain amino acids have a non continuous link of carbon bonds. Essentially having one carbon not in a linear fashion makes a branched point; all branched chain amino acids have one or more points of non continuous links.(Sowers,2009).

Oxidation of leucine is upregulated significantly during endurance exercise, reflecting the need for increased protein intake by athletes (Fuhrman,2010). While the dose for leucine is approximately 40 mg per kilogram of body weight per day, and isoleucine and valine are typically 10-30 mg per kilogram per day.(Sower,2009)

BCAAs and glutamic acid, both found in significant quantity in soy protein, aid in the replenishing of glutamine within the body, and without the risk of ammonia production caused by orally ingested glutamine, an amino acid usually added to whey protein.(Hammer Nutrition,2001).

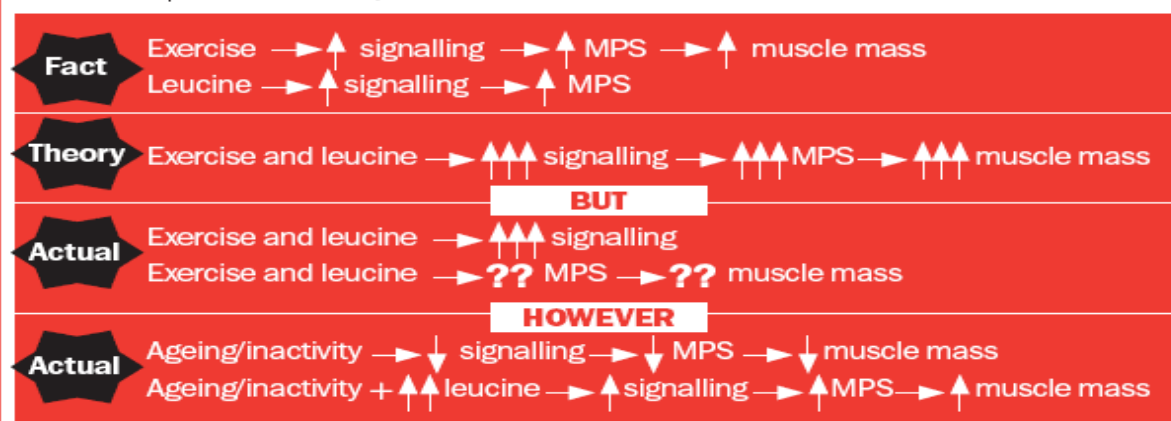
Beef, chicken, dairy, eggs, plant proteins such as sesame seeds, sunflower seeds, tofu, and pumpkin seeds are rich sources of BCAA. (Fuhrman,2010). Leucine especially can be found on almond, chickpeas, fish, lentils, peanuts, pork, seeds, walnuts. Peanuts, mushrooms, and grains are the sources of valine. The last of BCAA, isoleucine, we can find it on almonds, cashews, chicken, chickpeas, lentils, fish, liver, rye and seeds. (Tipton, 2013)

Some athletes can have quite high intakes of branched-chain amino acids (BCAAs) because of their high energy and protein intakes and also because they consume protein supplements, solutions of protein hydrolysates, and free amino acids. The requirement for protein may actually be higher in endurance athletes than in sedentary individuals because some amino acids, including the BCAAs, are oxidized in increased amounts during exercise compared with rest, and they must therefore be replenished by the diet. In the late 1970s, BCAAs were suggested to be the third fuel for skeletal muscle after carbohydrate and fat. However, the majority of later studies, using various exercise and treatment designs and several forms of administration of BCAAs (infusion, oral, and with and without carbohydrates), have failed to find a performance enhancing effect. No valid scientific evidence supports the commercial claims that orally ingested BCAAs have an anticatabolic effect during and after exercise in humans or that BCAA supplements may accelerate the repair of muscle damage after exercise. The recommended protein intakes for athletes (1.2 to 1.8 g/kg body mass<sup>-1</sup> d<sup>-1</sup>) do not seem to be harmful. Acute intakes of BCAA supplements of about 10–30 g/d seem to be without ill effect. However, the suggested reasons for taking such supplements have not received much support from well-controlled scientific studies.(Gleeson,2005).

Muscle tissue has 60% of the specific enzymes needed for oxidation (burning) of amino acids for energy, specifically BCAA's. In essence muscle is designed to burn BCAA amino acids for energy. During exercise the body uses BCAA's as energy. The longer and harder the

workout the more BCAA's are used in muscle for energy. It is estimated 3% to 18% of all workout energy is provided by the BCAA's, while some consider this to be conservative the duration and intensity levels can indicate greater or lesser amount of usage. The bodies need for the BCAA especially, Leucine is 25 times greater than the free amino pool, or readily available leucine. The free amino pool is free or single amino acids found in skeletal muscle, blood and cell plasma. (75% is in muscle) Free amino acids are amino acids not bound just 'waiting' for use. Because of the great need for Leucine the body must catabolise or breakdown muscle for the Leucine needed during a workout.(Sowers,2009).

**Figure 1:** Summary of what is known and what is speculated about the mechanism by which BCAA/leucine results in increased muscle protein synthesis and muscle mass in healthy, young adults and in the elderly and inactive; ↑ = increase; ↓ = decrease; MPS = muscle protein synthesis



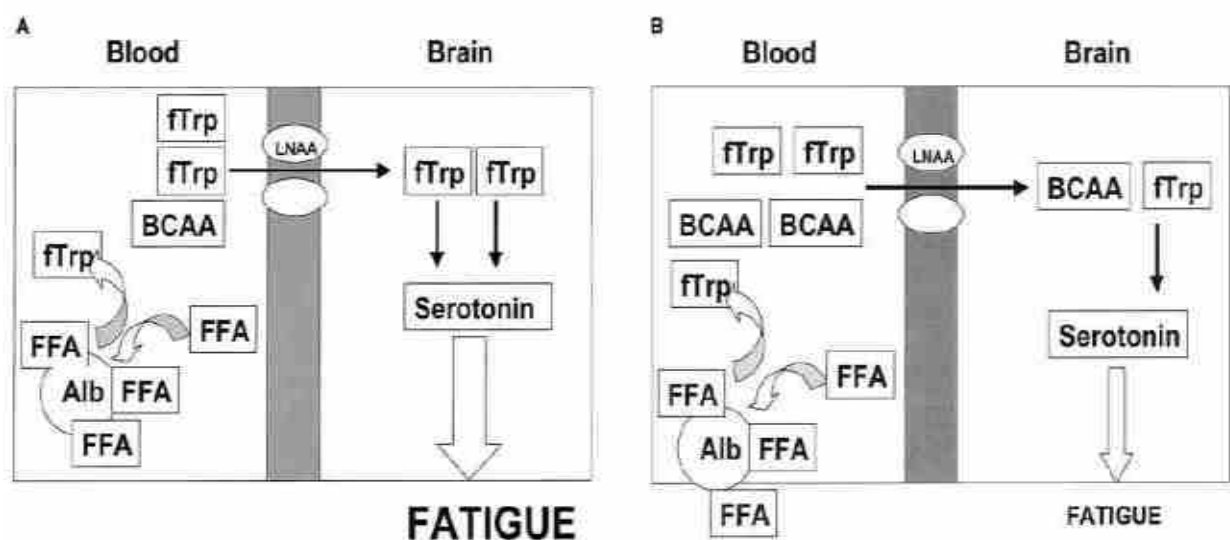
(Tipton,2013)

BCAA supplementation has been studied for its effects on various types of exercise performance, including ratings of perceived exertion (RPE) during exercise and mental performance following exercise. In general, the findings are equivocal, as are the conclusions from several recent reviews. One investigator concluded that BCAA supplementation reduces RPE and mental fatigue during prolonged exercise and improves cognitive performance after exercise, and also suggests that in some situations BCAA supplementation may improve physical performance, such as during exercise in the heat or in actual competitive races where central fatigue may be more pronounced than in laboratory experiments.(Williams,2005)

Prevention of fatigue and BCAA's with athletes occurs in two primary ways. First, the loss of ATP or cellular energy occurs with the loss of stored glucose in the form of glycogen. ATP levels are maintained by BCAA's degradation and fatty acid utilization after glycogen depletion. The effect of BCAA's as energy is approximately 3-18% and possibly more depending on duration and or intensity of the workout. Muscle tissue can oxidize leucine for energy or convert leucine into glutamine or alanine for blood energy. Glutamine or alanine can be converted into glucose. Also isoleucine and valine can be converted to Krebs cycle components for energy as well; making all three BCAA's a valuable source of muscle energy.(Gleeson,2005, Sowers,2009, Tipton,2013)

The second primary fatigue fighter for BCAA's is seen with BCAA's ability to prevent central fatigue in the nervous system. Central fatigue happens with the uptake of tryptophan by the brain increasing the levels of serotonin. Serotonin increases tiredness and fatigue demanding reset. BCAA's inhibit the brains ability to uptake tryptophan decreasing the brain levels of tryptophan. BCAA's do prevents sleep apnea in normal adults. (Gleeson,2005, Sowers,2009)

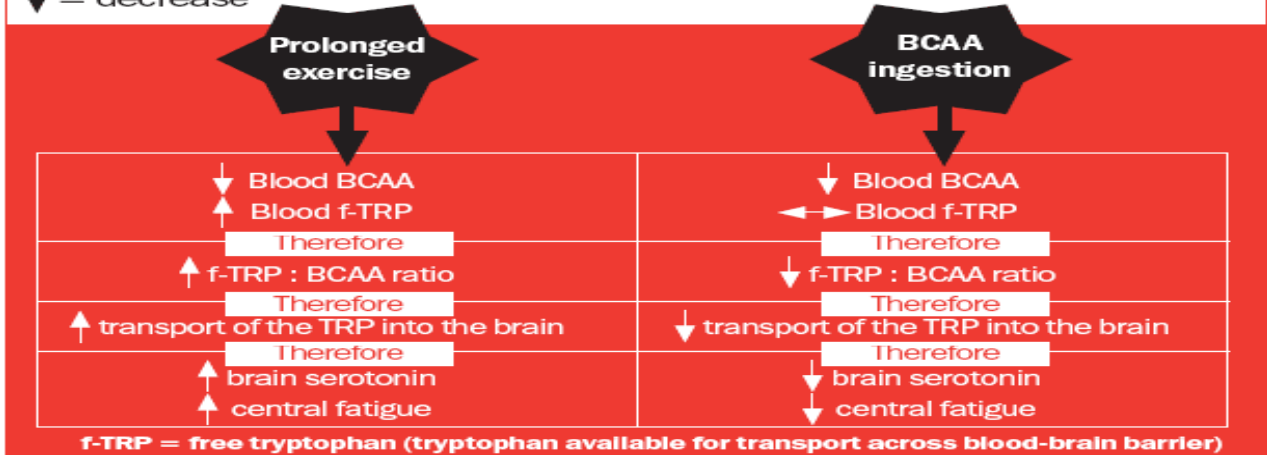
Hypothetically, BCAA supplementation may delay central nervous system fatigue and enhance performance in prolonged aerobic endurance events by increasing the BCAA:fTRYP ratio and mitigating the formation of serotonin.(Williams,2005)



**FIGURE 1** Central fatigue hypothesis. A) The central fatigue hypothesis proposes that during exercise FFAs are mobilized from adipose tissue and are transported via the blood to the muscles to serve as fuel. Because the rate of mobilization is greater than the rate of uptake by the muscle the circulating FFA concentration increases. Both FFA and the fTRP bind to albumin and compete for the same binding sites. fTRP is displaced from binding to albumin by the increasing FFA concentration and therefore the fTRP concentration and the fTRP:BCAA ratio in the blood rises. Experimental studies in humans have confirmed that these events occur. The central fatigue hypothesis predicts that the increase in this ratio results in an increased fTRP transport across the blood–brain barrier, because BCAAs and fTRP compete for carrier-mediated entry into the central nervous system by the LNAA transporter. Once taken up, the conversion of fTRP to serotonin (5-HT) occurs and leads to a local increase of this neurotransmitter. It has been well established that serotonin plays a role in the onset of sleep and that it is a determinant of mood and aggression. It was therefore hypothesized that the increase in serotonergic activity subsequently leads to central fatigue, forcing athletes to stop exercise or to reduce the exercise intensity. B) The involvement of plasma fTRP and BCAAs in the central fatigue hypothesis also predicts that ingestion of BCAAs will raise the plasma BCAA concentration and hence reduce transport of fTRP into the brain. Subsequent reduced formation of serotonin may alleviate sensations of fatigue and hence improve endurance exercise performance.

(Gleeson,2005)

**Figure 2:** Summary of the Central Fatigue Hypothesis and the hypothesis by which BCAAs are proposed to counter central fatigue; ↑ = increase; ↓ = decrease



(Tipton,2013)

For endurance athletes the use of BCAA's before and after the workout has shown to be effective in reducing total time for events. Cyclist and marathoners have shown positive effects when using BCAA's immediately before events and during an event. Improvements in mental performance and reduction in times have been noted. The reduction of lactic acid levels have been shown in some studies (reduced burn). Muscle mass loss has been shown to be reduced also. Two weeks of supplementation has shown improvements in time-trial cyclist, with trained athletes. It is also noted that some studies indicated no improvements. (Sowers,2009)

One study used approximately 3400 mg of leucine for a 170 pound man for recovery and tissue synthesis for lean individuals needing to build muscle. This study used whey protein mixed with the extra leucine. The diet consisted of 55% carbs and 15% proteins with added leucine spread throughout the day. Another study indicated the use of BCAA's, with approximately 50% leucine as the base with whey proteins at 1.26 grams per kilo which is about 107 grams per 170 pound individual. Here is a snap shoot of dose per weight and individual body weight. (Sowers,2009)

Many authorities agree that proper protein supplementation should be at 1.3-1.6 grams per kilogram of body weight daily for strength training athletes. Finally some good studies indicated 5.6 grams of BCAA's two times a day improved weight lifting recovery and improved muscle stability.(Sowers,2009)

Body weight in Pounds	BCAA's total grams	Proteins total grams
150	5650mg	94grams
170	6400mg	107grams
200	7500mg	125grams
250	9400mg	156grams
300	11300mg	187grams

(Sowers,2009)

The suggested dose of BCAA is 5 to 20 grams per day, taken in divided portions during exercise. BCAA can also be found in some sport drinks . These usually include 1 to 7 grams of BCAA per quart. If you try BCAA, start using it in training, not during competition . And remember that eating enough carbohydrate is just as effective as using BCAA.(ADA,2006)

Glycogen is the main sources to do exercise and if it take the low levels, fatigue is the answer. Therefore if BCAAs can be used in preference to glycogen at early stages of exercise, glycogen can be spared and use later. By consuming BCAAs,athletes also can improve their immuno function by increases blood levels of the amino acid glutamine. The last but not the least, BCAAs can associate with weight loss to maintain muscle mass but lost of fat.

Recovery from a workout as well as increased energy can be accomplished with BCAA's use. During exercise times when muscle contacting tissues are being degraded for energy non contractile muscle proteins decrease in catabolism, and inversely with reduction of exercise. In addition the breakdown of contractile tissue increases during post work recovery. So increasing the usage of BCAA's before and especially after workouts has been a norm for years producing a 'muscle sparing' effect.(Sowers,2009)

Consumption of high-protein diets (2.8 g protein/kg or less) by well-trained athletes does not appear to impair renal function, as indicated by various measures of renal function. However, certain individuals should be concerned with the protein content in their diet, such as those with diabetes mellitus predisposed to kidney disease, and those prone to kidney stones 6. Most amino acid supplements are safe in recommended dosages, but may interfere with protein metabolism if consumed in excess. Use of amino acid supplements is not prohibited by the World Anti-Doping Agency (WADA). (Williams,2005)

Watson and others 15 reported no beneficial effects of BCAA supplementation, consumed before and during prolonged cycling to exhaustion at 50 percent V02max in the heat, on performance time, heart rate, and core or skin temperature. Chevront and others 16 reported similar findings with subjects exercising in the heat, noting no significant effect of BCAA supplementation on time-trial performance, cognitive performance, mood, perceived exertion, or perceived thermal comfort. Although current research does not support an ergogenic effect of BCAA supplementation, most investigators recommend additional research.(Williams,2005)

## CONCLUSION AND SUGGESTION

Food sources for BCAA's are: whey, and milk proteins, beef, chicken, fish, soy proteins, eggs, baked beans, whole wheat, brown rice, almonds, brazil nuts, pumpkins seeds, lima beans, chick peas, cashew nuts, lentils, and corn.

Finally BCAA's are muscle tissue specific providing energy during workouts and muscle tissue stimulation and recovery when consumed after workouts or events in either food or supplement form. BCAA's can be used before and after workouts for increased energy, muscle sparing action, recovery, and muscle tissue stimulation and stability.

There are many claims for the effectiveness of BCAAs supplements related to athlete performance and exercise theoretically, still need more researches to prove it at humans studies as soon as possible to increase the prestige's nation too.

## REFERENCES

- American Dietetic Association.(2006).*Sports Nutrition: Tips for Fueling Athletes*.
- Fuhrman Joel and Ferreri Deana M.(2010).*Fueling the Vegetarian (Vegan) Athlete*.American College of Sports Medicine.
- Gaspar Erik J.(2010).*Nutrition Guide for College Aged Athletes*.Saint Mary's College of California.
- Gleeson Michael.(2005).Interrelationship between Physical activity and Branched Chain Amino Acids.*Journal of Nutrition* 0022-3166.American Society for Nutritional Sciences.
- Hammer Nutrition.(2001).*The Endurance Athlete's Guide to Success 9th Edition*.Atlantis Industries,LLC
- J.Anderson et al.(2010).*Nutrition for the Athlete*.Colorado State University Food and Nutrition Series Fact Sheet No 9:362.[www.ext.colostate.edu](http://www.ext.colostate.edu)
- Mustamin dkk.(2010).*Tingkat Pengetahuan Gizi, Asupan dan Status gizi atlet di Pusdiklat Olahraga Pelajar Sudiang Kota Makasar*.Media Gizi Pangan, Vol IX, Edisi 1 Januari-Juni 2010.
- Sowers Starkie,CN.(2009).A Primer On Branched Chain Amino Acids.*Literature Education Series On Dietary Supplements*.[www.hchs.edu](http://www.hchs.edu).
- Syafrizar Drs.M.Pd., Welis Wilda S.P M.Kes.(2011).*Gizi Olahraga*.Wineka Media
- Tipton Kevin and Sarah Jackmann.(2013).*Nutritional Supplements:BCAA and its effect on sports performance*.[www.pponline.co.uk/encyc/](http://www.pponline.co.uk/encyc/).diunduh pada tanggal 25 Maret 2014.
- Williams Melvin.(2005).Dietary Supplements and Sports Performance:Amino Acids.*Journal of the International Society of Sport Nutrition* 2(2):63-67.[www.sportsnutritionssociety.org](http://www.sportsnutritionssociety.org).



# THE EFFECT OF SIDE JUMP SPRINT TRAINING WITH 1:3 AND 1:5 WORK: REST RELIEF RATIO ON LEG MUSCLE POWER

I Nyoman Sudarmada

Ganesha Education University, Indonesia  
inyomansudarmada@yahoo.co.id

## Abstract

This study aims was determined the effect of side jump sprint training with 1:3 work and rest relief ratio and 1:5 work and rest relief ratio on leg muscle power. This research was a quasi experimental study design with the non-randomized control group pretest-posttest design. Subjects in this study were 30 students participants of extracurricular futsal SMP Negeri 2 Singaraja. The instrument used in this study to measure leg muscle power is the vertical power jump test (validity of test 0.989 and reliability of test 0.977). Data were analyzed with one way ANOVA test at a significance level of 0.05 using SPSS 16.0. Based on the data analyzis found: 1) There is an effect of 1:3 work and rest relief ratio side jump sprint training on leg muscle power, 2) There is an effect of 1:5 work and rest relief ratio side jump sprint training on leg muscle power, 3) There is a significant difference on the increase of leg muscle power as the effect of using the 1:3 and 1:5 work and rest relief ratio side jump sprint training. 1:3 work and rest relief ratio of side jump sprint training increase 1,93 and 1:5 work and rest relief ratio of side jump sprint training increase 3,39. Results of LSD (Least Significant Difference) shows that, side jump sprint training with 1:5 work and rest relief ratio is better than side jump sprint training by 1:3 work and rest relief ratio to increased leg muscle power with mean difference by 1,457. Conclusion of the study is side jump sprint training between 1:3 work and rest relief ratio and 1:5 work and rest relief ratio effect on the increase leg muscle power extracurricular student participants futsal SMP Negeri 2 Singaraja.

**Key words:** side jump sprint training, work and rest relief ratio, leg muscle power.

## INTRODUCTION

Exercise is physical activity that is competitive in a game, a team fight and ourselves. One form of competitive sport is indoor soccer. Futsal is a sport game team sport with a great ball that consist of two teams, each team consists of 5 people who played in were relatively smaller than a football game. Futsal game relies on speed, strength and leg muscle power, and excellent endurance. To be a good futsal player and reliable, someone must have excellent physical condition with good muscle condition, besides having the techniques and tactics as well as good cooperation with teammate.

Muscle is a connective tissue whose primary task is to contract which serves to move the body parts in knowing whether or not realize it. According lying leg muscle is divided into three parts, namely the muscles of the upper limbs, the muscles of the lower leg and foot muscles. One component of the physical condition that needs special attention in the development of the physical conditions in the sport of futsal is the explosive power of the leg muscles

Explosive power has a very important role in physical condition. Explosive leg muscle power is the ability of a muscle or muscle group of the leg to be able to use maximum force deployed in the shortest time - in a nutshell. Factors influencing the explosive power of the muscle are: 1) the extent of wide white muscle fibrils, 2) the strength and speed of muscle, 3) coordination of harmonic motion, 4) depending on the extent of chemicals in the muscles, and 5) the implementation of the correct technique. Based on the opinion of the above mentioned

two important elements in explosive power, namely: (a) muscle strength and (b) speed, in exerting maximum force to overcome the resistance. Developing explosive muscular power is a very important component of motion to be developed because it is able to support the activities in every sport. Besides developing explosive leg muscle power will provide maximum impact if given the time and the right portion as in adolescence.

In adolescence complex biological developments, which include accelerated growth, the proportion of body shape changes, the development of the respiratory system and cardiac work (Swadesi, 2009:95). However, based on observations conducted by researchers at the Junior High School 2 Singaraja there is a decrease in achievement over the last 3 years at sporting events in Buleleng. The lack of sporting achievement this is due to coaching physical condition is not good and focused and still monotonous training provided so that students feel bored with the training provided. The most important thing that can be done is based on the observation that the physical condition of the lack of guidance given in particular to train explosive leg muscle power.

Side jump sprint training is one alternative that can be used to increase the explosive power of the leg muscles. Side jump sprint training is a combination workout of lateral jump start to run full speed within a certain range. Implementation of this training is a jump to the right and left side past the box height 35 cm by 4-10 replicates. After landing on the last jump, do a quick run through the finish line with a distance of 15 meters. This encourages athletes to perform stepping aside and run to as soon as possible, as the main purpose of this exercise. Anticipate at the time of the last landing and be prepared for a quick run to the front. The emphasis of this training is not in the high jump, but the pace of implementation. Keep body and hips centered over the bench and take the legs from side to side alternately. This exercise involves the muscles of the quadriceps, hamstrings, hip flexors, gastrocnemius, and gluteal, and also train the coordination needed to change direction quickly. This exercise can be applied to the sport of tennis, basketball, baseball, soccer, indoor soccer, and other sports that use a variety of changes.

In any training provided, one important element that must be considered is the provision of time off (recovery) in one training session. Granting time off (recovery) addressed to the muscles, tendons, and ligaments for recovery time. Recovery is rest time between sets is given by the time or between reps (repeat). There are two kinds of recovery and recovery interval and the interval is complete and incomplete. And complete recovery interval of more than 90 seconds, while incomplete less than 90 seconds. But often the two types of recovery and the interval is less suitable given the speed exercises, so that in determining the recovery time and interval time using the comparison work and rest. The shorter administration time interval during exercise and recovery, meaning the higher the exercise intensity. Conversely, if the longer administration time interval during exercise and recovery means that the lower the intensity.

Related on an implementation of interval training usually includes many sets, repetitions, time or distance intervals of activity implementation, training time, and the recovery time interval. Way of doing interval training interval adjusted work with sports branch. Types of activities selected for general physical exercise based on his choice. Comparison between work intervals with rest intervals of not only increasing the interval works alone, but also resting intervals should not be ignored, both the duration and shape. Rest interval can be either passive rest (relative rest) and active rest (relief work) and the suggested duration of this interval is expressed by the ratio between working time and rest time. Hare (1981) describes the ratio between working time and rest periods are as follows:

- To develop endurance, work and rest ratios are used between 1:5 - 1:1. Where the first number indicates the time to work while the second number indicates the length of time for a break
- To develop maximum power of particular strength or explosive power, rest interval is at 2-5 minutes or depending on the percentage of the load or the rhythm of implementation.

As a summary of the work and rest intervals systems and bioenergetic specifications can be described as follows (Bompa, 2009: 105):

Based on the maximum amount of time used in the training then it goes into the target fast glycolysis energy system that can use the ratio of work : rest 1:3 and 1:5 , which means that the recovery time was given 3 and 5 times longer working time. Based on the above, researchers were interested in developing further the study titled Theeffect of side jump sprint training with work and rest reliefratio 1:3 and 1:5 onexplosive leg muscle power.

The objectives of this research are: 1) to determine the effect of side jumpsprint trainingwith ratio of work :rest 1:3 and 1:5 to increased leg muscle explosive power, 2. To find out the difference between the effect of side jumpsprint training with ratio of work : rest relief 1:3 and 1:5 to increased leg muscle explosive power in student member of extracurricular futsal SMP 2 Singaraja academic year 2013/2014

## Method

This study belongs to the quasi-experimental ( quasi -experimental ) with the aim of obtaining information are estimates for information that can be obtained by actual experiment in a state that does not allow to control or manipulate all relevant variables. Subjects in this study were participants of extracurricular futsal of SMPN 2 Singaraja Academic Year 2013/2014, amounting to 30 people. The research design used in this study are the non-randomized control group pretest-posttest design.

After the pre-test (initial test), subjects were divided into three groups by using the technique of dividing the group as an ordinal pairing. Group 1 was given treatment in the form of side jump sprint training with work rest ratio of 1:3, group 2 was given treatment in the form of side jump sprint training with work rest ratio of 1:5, and the third group was the control group were given treatment futsal game activities. The instrument used in this study is the power vertical jump test to measure the explosive power of the leg muscles. Data was collected from the initial test data (pre-test) and final test (post-test) in each group is the control group and the treatment group. Tests carried out after the end of the treatment group was given side jump sprint training with the ratio of 1:3 and 1:5 work rest for 12 times the exercise with the same test as the initial test ( pre-test ) . Further analyzed based on the results of measurements of each group. Data analysis was performed with the test requirements that must be met that test data normality and homogeneity test data. To use the results of research Hypothesis ANOVA test, which consists of one track and the comparison test is a test of Least Significant Difference (LSD).

## RESULTS AND DISCUSSION

Based on the results of training conducted over 12 meetings and the implementation of the final test (post-test) using the instrument power vertical jump test data obtained by different (gain score) which will be analyzed to test the hypothesis conduct research. In the treatment group side jump sprint training with work rest ratio of 1:3 has an average value of pre -test of 35.75 with a highest score lowest score 30.46 41.14 and a standard deviation of 3.536 and the average value of the post-test for 37.68 with a highest score lowest score 31.53 43.27 and a standard deviation of 3.773 . Thus the average value of the group treated with the side jump sprint training with work rest ratio of 1:3 increased 1.93. In the treatment group side jump sprint training with work rest ratio of 1:5 has an average value of pre -test of 35.78 with a highest score of 30.55 and 40.58 the lowest value of 3.49 and standard deviation of the average value of the post - tests at 39.17 with a highest score lowest score 33.34 and 44.83 standard deviation 3.814 . Thus the average value of the group treated with the side jump sprint training with work rest ratio of 1:5 increased by 3.39 . And in the control group had an average score of pre-test was 35.91 with a highest score lowest score 31.08 40.31 and a standard deviation of 3.416 and the average value of the post-test of 37.04 with a highest score 42.36 value 31.93 and the lowest standard deviation of 3.564 . Thus the average value of the control group increased by 1.13

## RESULTS

From the results of normality test data with the instrument Kolmogorof-Smirnov test with the help of a computer program SPSS 16.0, a significance level ( $\alpha$ ) of 0.05. The results of normality test data can be presented in table 2.

**Table 1. Result of Normality Test**

Data Sources	Kolmogorov Smirnov			
	Statistik	Df	Sig	
Leg Muscle Power				
1. Side Jump SprintWRR 1:3	0,148	10	0,200	Normal
2. Side Jump SprintWRR 1:5	0,118	10	0,200	Normal
3. Control	0,155	10	0,200	Normal

From the above table it can be seen that the significance  $> 0.05$  so that all groups are normally distributed. The results of Levene's test of homogeneity using the test with SPSS 16.0, a significance level ( $\alpha$ ) of 0.05. Test of homogeneity of variance was conducted to test the similarity of treatment group and the control group. Results of homogeneity test can be displayed in table 2.

**Table 2. Result of Homogeneity Test**

Data Sources	Levene Statistic	df 1	df 2	Sig	
<b>Leg Muscle Power</b>					
Based on Mean	1,385	2	27	0,268	Homogen
Based on Median	1,376	2	27	0,270	Homogen

From the above table it can be seen that the significance  $> 0.05$  so that the data is equal or homogeneous. After the test prerequisites are met then the hypothesis is tested. Hypothesis testing using the Anova test track with the help of the computer program SPSS 16.0, a significance level ( $\alpha$ ) of 0.05. The research hypothesis is accepted if the value of the Anova test track has less significance than  $\alpha$  (sig  $< 0.05$ ). Whereas if the count is greater significance value  $\alpha$  (sig  $> 0.05$ ), then the hypothesis is rejected. Anova test results of the pathway can be displayed in table 3.

**Table 3. Result of One Way ANAVA Test**

Leg Muscle Power	Sum of Squares	df	Mean Square	F	Sig
Between Groups	26,230	2	13,115	31,124	0,000
Within Groups	11,378	27	0,421		
Total	37,608	29			

From the results of the ANOVA test score data path gaint explosive leg muscle obtained F value of 31.124 with a significance of 0.000 is less than  $\alpha$  (sig  $< 0.05$ ), so the hypothesis of the study there were significant differences in the effect of each group.

Because there is a difference between the effect of side jump sprint training with the ratio of work : rest 1:3 and 1:5 to increased leg muscle explosive power , then further testing or testing in comparison with test instruments Least Significant Difference ( LSD ) with the help of the computer program SPSS 16 , 0 at significance level (  $\alpha$  ) of 0.05 . Decision criteria based on the mean value of the difference largest and whether there is any sign of ast( \* ) in column 'mean difference'. If the sign ast( \* ) in the figures mean difference or average difference , the difference is real and significant. So the training that gets the greatest value and no sign of ast( \* ) is a better training effect on the increase. LSD test results can be displayed in table 4.

**Table 4.The Result Of LSD Test on Leg Muscle Power**

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Side Jump Sprint 1:3	Side Jump Sprint 1:5	-1.45700*	.29031	.000	-2.0527	-.8613
	Kontrol	.80200*	.29031	.010	.2063	1.3977
Side Jump Sprint 1:5	Side Jump Sprint 1:3	1.45700*	.29031	.000	.8613	2.0527
	Kontrol	2.25900*	.29031	.000	1.6633	2.8547
Control	Side Jump Sprint 1:3	-.80200*	.29031	.010	-1.3977	-.2063
	Side Jump Sprint 1:5	-2.25900*	.29031	.000	-2.8547	-1.6633

From the results of the LSD mean difference between groups can be concluded:  
a. Side jump sprint training with the ratio of work: rest 1:5 is better than side jump sprint training with the ratio of work: rest 1:3 to increased leg muscle explosive power of 1,457. b. Side jump sprint training with the ratio of work: rest 1:5 better than the control group to the increase in leg muscle explosive power of 2,259. c. Side jump sprint training with the ratio of work: rest 1:3 better than the control group at 0.802.

## DISCUSSION

Analysis of the research for the dependent variable showed an increase in the average (mean) for each variable. From the description of the data variable leg muscle explosive power as seen in the increase in the average (mean) in both the treatment group and the control group . The treatment group side jump sprint training with the ratio of work : rest 1:3 has increased an average of 1.93 of the average pre - test 35.75 into 37.68 in post - test . The treatment group side jump sprint training with the ratio of work : rest 1:5 has increased an average of 3.39 of the average pre-test 35.78 and at post-test 39.17. Whereas in the control group experienced an average increase of 1.13 of the average pre - test 35.91 into 37.04 in post - test. From the description above, there has been an increase in leg muscle explosive power variable, treatment group and the control group increased, with an increase in the average value of the treatment group is higher than in the control group. This shows the influence of the training provided to the increase in leg muscle explosive power on the research subject. The increase in the treatment group due to side jump sprint training delivery with the ratio of work : rest 1:3 and 1:5 for 4 weeks with 12 times of training , while an increase in the variable leg muscles more explosive power caused by the shape and increase in exercise activity conducted by all study subjects during the activity.

Theoretically, the results of research side jump sprint training with the ratio of work : rest 1:3 and 1:5 effect on the increase in leg muscle explosive power can be described as follows

, namely the explosive power or power is also known as explosive strength . Power involves strength and speed of muscle contraction is a dynamic and explosive and involves spending maximum muscle strength in the soonest possible time (Ismaryati, 2008:59). Thus, explosive leg muscle power is the ability of a muscle or group of muscles to be able to use the limb maximum strength deployed in the shortest time - in a nutshell. Thus, to be able to produce the explosive power needed good leg muscle strength training and muscle contraction. The purpose of the exercise is to increase the explosive power of technical skill as well as an emphasis on training load for each element of the movement.

It's important for sports that require explosive movements are characterized by movements or sudden changes fast, in which the body pushed upward (vertically) either jump or jump forward (horizontal) to exert maximum muscle strength such as sprinting, number - throwing events in athletics or sports branches that the movement is dominated by the jump in the sport volleyball, football and also in sports like badminton as well. As one of the components of the physical condition, muscular limbs explosive power can be enhanced through training programs designed systematically and continuously by following the basic principles of proper training.

Side jump sprint training is a combination workout of lateral jump start to run full speed within a certain range. The mechanism of movement side sprint jump is done by jumping k right and left side past the box height 35 cm by 4-10 replicates. After landing on the last jump, do a quick run through the finish line with a distance of 15 meters. This exercise involves muscles such as the quadriceps muscles, hamstrings, hip flexors, gastrocnemius, and gluteals. The series of sprint jump side movement will provide a load on the leg muscles, which causes an increase in muscle size (muscle hypertrophy) can increase leg muscle strength.

In addition, the speed also increases leg muscle with bouncing movements are done quickly and repeatedly. It is also described by Marino in a thesis entitled influence practice models and eye - foot coordination on the ability to dribble the soccer game (the experimental model of the influence of side jump sprint drills and dodging run on primary school football student in Sukoharjo (2010: 52) stated that the side jump sprint training is a blend that consists of motion movement jumping, changing direction and running sideways motion. In the implementation of the exercise, the player must be able to weave and coordinate the movement simultaneously. Thus, the side jump sprint exercise also improves the coordination of movement. Side jump sprint workout can be applied and given to football players. Exercise can increase the side jump sprint physical abilities required by soccer players, especially to support the dribbling ability.

Based on the above, the side jump sprint training programmed and systematic manner for 12 sessions or for 4 weeks with a frequency of 3 times a week can lead to a change or an increase in leg muscle components that will directly affect the increase in leg muscle explosive power. There is a difference between side jumpsprint training with 1:3 and 1:5 work-rest relief ratio on explosive leg muscle power. Theoretically, the results showed the difference between the effect of side jump sprint training with the ratio of work : rest 1:3 and 1:5 against the leg muscles that explosive power side jump sprint training with the ratio of work : rest 1:3 and 1:5 have time distinct break . Side jump sprint training with the ratio of work : rest 1:3 side movement mechanism is repeated sprint jump in 30 seconds with rest periods 3 times longer than the working time is 90 seconds , while the side jump sprint training with the ratio of work : rest 1:5 side movement mechanism is repeated sprint jump in 30 seconds with rest periods of 5 times longer working time is 150 seconds. The rest of the time difference, then there is a distinction between the effect of side jump sprint training with the ratio of work : rest 1:3 and 1:5 against explosive leg muscle power.

Difference in treatment given during the exercise, will get a different response from the subject, so as to give a different effect on the formation of capabilities in research subjects. Intended effect is an increase in leg muscle explosive power that can not be separated from the principles of speed and strength training. According to RatnaKumalaSetyaningrum (2012 : 7) in the journal entitled differences in the effect of the ratio of work : rest interval training anaerobic

and aerobic capacity to run 100 -meter men's speed stated that , in practice the principle is the speed of work / exercise carried out with maximum speed . To recover the ATP and PC have been exhausted, it is necessary to rest enough to be able to achieve full recovery (maximum recovery). With a long time off , side jump sprint training with the ratio of work : rest 1:5 provide muscle recovery time longer so that the condition of the subject tend pulse has returned to practice , so the influence on the improvement of motor function of the leg muscles , especially the explosive power better . Due to an increase in the ability of anaerobic exercise such as jumping requires adequate rest. Hence the side jump sprint training with the ratio of work : rest 1:5 can give a better effect than side jump sprint training with the ratio of work : rest 1:3 . Training side jump sprint training with the ratio of work : rest 1:3 and 1:5 held for 4 weeks or 12 times with a frequency of 3 times a week . With the frequency and duration of the training that has been programmed, then this study has been able to address existing hypotheses .

## CONCLUSION

Based on the results of the data analysis and discussion, in this study can be summarized as follows, namely : side jump sprint training with the ratio of work : rest 1:3 effect on the increase in leg muscle explosive power extracurricular participants futsal students of SMP Negeri 2 Singaraja academic year 2013/2014, side jump sprint training with the ratio of work : rest 1:5 effect on the increase in leg muscle explosive power extracurricular participants futsal students of SMP Negeri 2 Singaraja academic year 2013/2014 , there is a difference between the effect of side jump sprint training with the ratio of work : rest 1:3 and 1:5 to increased leg muscle explosive power extracurricular student participants futsal SMP Negeri 2 Singaraja academic year 2013/2014.

## ACKNOWLEDGMENT

Based on these results, the things that can be suggestebd is as follows, namely:  
 1) It is recommended for sports coaches , sports coaches , teachers, athletes and actors Penjasorkes and other sports can use jump training side sprint to the ratio of work : rest 1:3 and 1:5 were programmed well as one alternative to improve the freshness of the elements to increase the physical particular leg muscle explosive power.2 ) For other researchers, if you want to do similar research is recommended to use a variable and subject or a different sample, with attention to the weaknesses that exist in this study for comparison.

## REFERENCES

- [1]Tudor O. Bompa, G. Gregory Haff. 2009. *Periodization Theory and Methodology of Training*.
- [2]Ismaryati. 2008. *TesdanPengukuranOlahraga*. Surakarta:LPP UNS dan UNS.
- [3]Marino. 2010. *ThesisPengaruh Model Latihan Dan Koordinasi Mata-Kaki TerhadapKemampuanMenggiring Bola PadaPermainanSepakbola*.
- [4]Setyaningrum, Ratna Kumala. 2012. *PerbedaanPengaruhRasioKerjaIstirahatLatihan Interval Anaerob Dan KapasitasAerobTerhadapKecepatanLari 100 Meter Putra*. JurnalIlmiahSPIRIT.
- [5]Swadesi, I KetutIwan. 2009. *Buku Ajar PerkembangandanBelajarMotorik*. Singaraja: UniversitasPendidikanGanesha.
- [6]Tuti Ariani, Luh Putu. 2011. *Dasar-Dasar Kepelatihan Olahraga*. Singaraja. Universitas Pendidikan Ganesha.

# **MARKETING STRATEGIES OF TUBINGSPO RTS TO INCREASED TOURIST TO VISIT BALI**

**I Wayan Muliarta<sup>1</sup> and Kadek Yogi Parta Lesmana<sup>2</sup>**

**Ganesha Education University, Indonesia  
muliarta\_iwayan@yahoo.com**

## **Abstract**

Bali tourism development is the construction of a continuous and ongoing. The ability to read global market development is needed in the development of tourism. The tourism industry has always demanded the ability to predict and anticipate the development of tourism competitors. Strong marketing capabilities, reliable management is very helpful in developing tourism in Bali. Marketing is a gateway consumer appeal or tourists to buy company products offered.

Sport tourism industry has a variety of shapes and unique product that has not been managed by tourism entrepreneurs. Tubing is an exciting and unique product in the sports tourism that special handling in require order to be marketed to tourists and a superior product Bali. Bali has an interesting variety of characters and unique river to be a place of tubing that can be marketed to the world. Success in the world tourism market penetration requires a variety of strategies and products spawned empathy tourist attractions.

The purpose of writing this paper is to determine how exercise tubing marketing strategies to increase tourist visits to Bali. As for the benefits to be achieved in this paper is to provide insight and understanding of how sports marketing strategy tubing to increase tourist visits to Bali. Apparently tubing marketing strategy to increase tourist visits to Bali is a modern marketing strategy, namely: market segmentation (segmenting), the determination of the target market (targeting), and the determination of market positioning (positioning) so that the sports industry tubing products can be recognized and enjoyed by tourists want visit to Bali.

**Keyword**; Strategy, Marketing, Tubing and Tourist

## **INTRODUCTION**

### **Backgrounds of Study**

Bali is the symbol of tourism in Indonesia, has become one of the world tourism destination that is very popular for a variety of abundant natural resources scattered throughout the island. Culture and natural beauty of the island is owned by natural resources need to be conserved. The figure of culture consisting of poets, writers and painters, is what delivers the uniqueness of Bali increasingly spread around the world. Submission of information through various media by a stranger was able to attract tourists to visit Bali (Bali Astro, 2009).

Tourism development is the construction of a continuous and ongoing. The ability to read global market development is needed in the development of tourism. The tourism industry has always demanded the ability to predict and anticipate the development of tourism competitors. Strong marketing capabilities, reliable management is very helpful in developing tourism. By getting to know each character



tourists from various countries is the initial capital to develop the tourism product in accordance with the character of travelers. For example, tourists coming from Europe tend to want to see and enjoy the culture, the beauty of nature and adrenaline sports they are on the island of Bali. It is confirmed that Bali has an abundance of natural beauty and still able to competing with some regions in the world in the tourism area.

The improvement of tourist to Bali is not spared from the development of tourism in Bali in the field of sports tourism. Sports tourism is a tool that gives opportunities and gives opportunities for people to get to know about nature. Sports tourism is also an activity that provides an opportunity for people to get to know the privilege other places (Irdana Saputra, 2009).

The development of the tourism industry of course has a direct impact to the community, then the factor of sports and tourism to great entrepreneurial opportunity. The more growth and increased tourist interest towards sports tourism, then more opportunities to develop the shape and type of exercise that will be developed into sports tourism. The type and form of exercise that has been the interest is a challenging sport outdoor, such as water, land, and air sports, which are excellent travelers. Many kinds of outdoor activities has own charm it necessary to continue to digging tourism sports as variations tourist product. One type of sport which in this time starts to develop is tubing sport.

The development of the tourism industry can not be separated from the development of models and marketing strategies developed by the stakeholders of the tourism industry. The marketing strategy is very important because it is a system that should be owned by every entrepreneur tourism industry. Without the marketing strategy of the tourism industry as well as any product which is owned by the employer will not be able to recognize by tourists. Like a development of information technology, it a good tool as a media to marketing the tourist products.

Bali has many characteristics of the river that have the potential to be used as a place to exercise tubing. Like an Ayung river which located in Ubud, Gianyar. It is one of the longest and major rivers in the province of Bali. The river flows south of the mountains that limit North Bali and South Bali. A characteristic of the Ayung River valley has a shape that resembles the letter V, which is at the bottom of the river is narrow and getting to the top of the greater (PT.Sari Profit, 2010).

Tubing sports consists of two characteristics of the activities in a way that moves its own (free-floating) and the second is drawn (tied to a specific vehicle) both have a different thrill. Meanwhile, for a playing ground divided into three places there are on water (river or lake), on snow and on air. So interesting tubing for tourist to enjoyed it so that's very important to able to marketing to the tourist as variations choices of tourist product which has in Bali.

Pulling tubing is usually done on the lake. Tie circular tube in a boat or motor boat, then pulled quickly, sometimes tubing is also commonly performed in a snowy field in winter. usually on hillsides or done in the field of snow or ice vast flat, by tubing and pulled by snowmobiles, exercise tubing in air by certain factors, such as material, weight, speed and other tube can be lifted and fly, as well as Flying Fish ride. It is mentioned that the tubing can be done on the air.

In order hand, to the move itself or free floating, tubing is usually played in the river. The river used is not too wide river activities like rafting (Ernowo-Okezone Pasha, 2011). River tubing or also known as body rafting is a variation of a very challenging sport. Similarly rafting, tubing is also done in the river with fording the

river current, this sport was done itself with tire in inner of FUSO truck that modified, but along era of tubing sport know it can be done by two people with using one tube. Almost all of outdoor activities has risk, because tubing use river as media, but if players follow the rules so that tubing game can be fun activities till the form adventure which very challenging when doing tubing.

In other to health physical, highest bouncing and balance help to control tubing and minimize the danger or risk that comes from own self. Such types of outdoor or others activities; there is always an objective danger, from nature or place of activity. Tubing exactly played on the flow of the river is not too wide body but shallow, as in the Ayungriver. So that virtually no part of the river depths exceeding adult chest though grid tributaries ranged from 2 to 3. A sensation when it was played tubing when the rains hit the river rafting and tubing high enough. More safety if readable the characters of the river, signs of nature, not easy to panic and, in doing river tubing requires strong mental and comply with regulations.

Around of Ayung river there are some companies which manage river sports such as rafting but when saw the potensial of Ayung river and to increase the enthusiastic of river sports so need there are several variations of river sports again such as tubing sport because in Ayung stable enough so that debit of water when dry season and rainy season not too high which is very support tubing sports activities. This sports is fun and challenging sports because doing this sport ownself on river current which calm or not too rapid with using tire (inner tube) that has been modified.

In addition to enjoying the beauty and uniqueness of the Ayung river can be doing tubing sport with using inner tube. By doing tubing sport, tourists can see the types of wildlife around the location of activities such as monkeys which plays, squirrel, tangsiah, tengkek, starlings, bats), plants that beuaty around the location of activities, carving stone there is around river walls and rapid waterfall in Ayung (PT.Sari Profit, 2010).

This sport has a tremendous opportunity to be marketed as enthusiasts of this sport very much. If tubing can be marketing more optimal in Ayungriver, more advantages can be obtained. While exercise tubing is becoming known and marketed in the Ayungriver and Bali, the employer rafting tubing will sell a new product that much needed manpower and invites many tourists to visit Bali.

Based on the background of the above conditions then it is essential to study more in depth about tubing sports marketing strategy to increase tourist visits to Bali.

#### **Limit of Problems**

Related to the above description of the background of the problems that exist are limited in how sports marketing strategy tubing to increase tourist visits to Bali.

#### **Writing Objectives**

The purpose of writing this paper is to determine how exercise tubing marketing strategies to increase tourist visits to Bali.

#### **Benefits of Writing**

As for the benefits to be achieved in this paper is to provide insight and understanding of how sports marketing strategy tubing to increase tourist visits to Bali.

### **EXPLANATION**

#### **Definition of Marketing**

There are several definitions according to the marketing experts such as Philip Kotler (Marketing) Marketing is human activity directed to meet the needs and wants

through exchange processes. According to Philip Kotler and Armstrong is marketing as a social and managerial process where individuals and groups obtain what they need and want through creating and exchanging products and value reciprocity with others. Overall system of activities aimed to plan, determine the price, promote and distribute goods and services to satisfy the needs of the buyer is called marketing. So marketing is a total system of business activities designed to plan, determine pricing, promotion and distribution of goods can satisfy the desire and achieve the company's target market and goals (Tjiptono, 1995).

### **Concept of Marketing**

The marketing concept says that the key to achieving organizational goals consists of determining the needs and wants of target markets and deliver the expected satisfaction more effectively and efficiently than the existing marketing competitor. Concept of expressed in various ways by (JC. Penney, 2010); find desire market and meet, for what can be sold and do not try to sell what can be made, love the customer, not the product, take it as a strategy (burger king), determining (united airlines), do everything within the limits of the ability to appreciate the customer's money is loaded with value, quality and satisfaction.

There are six concepts in marketing which is the basis of the implementation of the marketing activities of an organization, namely: the production concept, product concept, selling concept, marketing concept, the concept of social marketing, and global marketing concepts.

### **Marketing System**

The system is a group of items or parts that are interconnected and interrelated permanently integrated to form a single unit. So it can be interpreted marketing system is the variety of items that perform marketing tasks of things, services, ideas, people, and environmental factors that influence and shape each other and influence the company's relationship with its market.

In marketing the items that are interconnected and intertwined it covers; joint marketing organization to accomplish work, products (services, ideas or human) is marketed, the target market, intermediaries (retailers, wholesalers, transport agencies, financial institutions), environmental constraints (environmental constraints).

The simplest marketing system consists of two related elements, namely the marketing organization and target marketing. Elements of a marketing system similar with elements which are in radio stereo system marketing with vertical channel, marketing system with horizontal channel, and marketing system with double channel. The existence of three kinds of marketing, we then must determine a good marketing environment such as: external macro environment and external microenvironment. Examples of external macro-environment are: demographic (population), economic conditions, technological, social and cultural forces, political and legal forces, and the competition. Then the external micro environment is an example: the market (market), suppliers, brokers (intermediaries marketing).

### **Marketing Strategy**

Marketing strategy is a set of goals and objectives, policies and rules that give direction to the marketing efforts from time to time on each level and location. Modern marketing strategy generally consists of three stages: market segmentation (segmenting), the determination of the target market (targeting), and the determination of market positioning (positioning) (Kotler, 2001). After learning market segments, target markets, and market position, it can devise marketing mix (marketing mix),

which consists of product strategy, pricing, delivery / distribution and promotion (Assauri, 1999).

### **Market Segmentation (Segmenting)**

In general, there are three basic philosophy as a guideline for companies to approach the market, namely the mass marketing where the decision to produce and distribute products en masse, marketing a range of products that serve a selection of different products for different segments, and targeted marketing are developing products for specific market .

Producer and modern companies, now away from mass marketing and marketing variety of products and targeted marketing approach. Sellers can develop the right product for each target market and adjust prices, distribution channels and advertising to reach the target market efficiently.

By using targeted marketing, which is closer to the form of micro marketing, corporate marketing programs adjust to the needs and desires of the geographic segments, demographics, psychographic, or behavior, defined narrowly. The final form of targeted marketing is marketing a customized that is when companies adapt products and marketing programs to the needs of specific customers.

### **Creating Consumer Market Segmentation**

There is no single way to create a market segment. Marketers should try different segmentation variables, either independently or in combination to find the best way to map the structure of the market. There are several key variables that are often used to define the segmentation of the market, the geographic variables, demographic, psychographic, and specific behaviors.

### **Importance of Doing Segmentation**

Segmentation is necessary because:

- 1) Vendor to better understand the behavior of market segments more homogeneous so that it can better serve their needs. Marketing program can be directed according to behaviors and needs of each market segment.
- 2) If the market is too broad and behave very diverse, companies can select one or more segments of the market only. So that the capacity of the market can be more in line with broad market segments are formed.
- 3) Markets are dynamic, not static, which means that the market is developing steadily marked by changes such as attitude, life cycle, family situation, income, geographical patterns and so on.
- 4) Product of goods or services change according to the product life cycle, from the introductory stage to the stage of decline.

### **Model of Marketing Strategy Information Systems**

Model Marketing Information System which is often known as the Marketing Information System (MKIS) is a model for organizing all information systems functional. Marketing information system model consists of subsystem input and output subsystems.

Model input subsystem consists of:

- a) SIA is a system which collects various transactions marketing company.
- b) The marketing research conducting special studies to study the needs of consumers, and enhance marketing efficiency.
- c) Marketing Intelligence gathers information from the company related to the company's operations.

Model output subsystem consists of:

- a) Product (product)  
Products intended to relate how to gratify the desires or needs of the customer. Products can be physical as well as the market.
- b) Promotion (promotion)  
Promotional deals with a way to push product sales company that has been introduced to the public as well as new products.
- c) Place (place)  
Place relates to a way to produce and to distribute physical product to customers through distribution channels.
- d) Price (price)  
Price related to the sustainable elements of what is paid by the customer to obtain a desired product.

### **History of Tubing**

Tubing which literally means the tube (tube) climbing is a recreational activity that is usually a circular tube above the water flow, the river. Tubing which grow in America also known as Tubing and the people doing Tubing is called Tubers (Pasha Ernowo - Okezone 2011).

Appearance of boredom of rafting guide in America finally he doing water sports using tire in FUSO which modified which centers equipped with safety string for the handle and sitting down for bottom. Want to fording more interesting, more challenging. People who are already very familiar with the character of the river was wearing a float jacket, helmet, shoes for himself as a safety during tubing sport, and began wading through the river with calm water or too heavy, looking at the passing scenery during tubing.

Not too long, the Americans originator of this tubing to replace buoys that FUSO tire initially tied with rubber just got better, the form continues to be developed, the basic form of the tire until it reaches the river known today. Tubing is now widespread in the United States and Indonesia. In time make a develop rapid growth and there are many visitors who come to do the tubing.

One character describes modern tubing, has actually been there all the time, anyone that goes to the river with any flotation devices he can not drown. For example, there are groups of people who use car tires and tree bars are assembled to transport and even now there remain such activities as elementary school age children with relaxed playing in the river only to tire in the car. Likely prehistoric era still take place hitherto (James Monahan, 2003)

### **Development of Sports Tubing**

Tubing is a water sport that is quite challenging and fun. Tubing Sports in Indonesia are admired the world. Tried various maneuvers turn out tubing is also more stable. Tubing is place for relaxing and entertainment. Travelers also could use a hand or foot to set (movement, control tube, and avoid obstacles) and relaxed with the flow of the river so that the inner tube in use continue to run across the river. Even for those who do not know how to swim so no need to worry, because the tubing in the river do not have to be smart enough to swim because tourists simply by putting bodies in the inner tube and maintaining stability over in the water.

Tubing in the early development of the country might be a little late, it was not just about the price, although the price of overseas tubing means millions. Perhaps more play is slow flow of information. This condition can not be separated from the

community tourism Awareness Pacarejo Village, District Semanu, Gunung kidul the onlycavetubingtourinIndonesia. Cave TubingKalisuciranksthirdin the world afterCaveTubingin Central America, andNewZealand.

Attentionyoung childreninYogyakarta, a group ofsports fansmoretubingtogethersparkto leadtubinginIndonesiaand heldjoint exercisesacross the riverby usinga modifiedinner tubeand specially designedtosuitthe character ofthe body ofthe RiverKalisuciandsince thenitexercisesand socializationare intensifiedin severalriversin the country. In a further developmentof thesportactiviststubingwidespreadconsidersthe need foranumbrellaorganizationtothe sport,so thatin the futurethere isuniformityin the rulesandprocedures thatmaybecome a common.

## CONCLUSION AND SUGGESTIONS

### Conclusion

In fact, marketing strategies of tubing to increase the tourist com to Bali is a modern marketing strategy that is; marketing segmentation (segmenting), target of marketing (targeting), and position of marketing (positioning) so that the product industry of tubing sport can be known and enjoyed by the tourist who wants to visit Bali.

### Suggestions

Based on the conclusion above, so the suggestions can be write is very important for the stakeholder industry of tourism sports to apply the modern marketing strategies that is; marketing segmentation (segmenting), target of marketing (targeting), and position of marketing (positioning) so that the product industry of tubing sport can be known and enjoyed by the tourist who wants to visit Bali.

## REFERENCES

- Assauri.1999.*StrategiPemasaranInternasional*. TersediaPada<http://fitrian.staff.gunadarma.ac.id>.Diaksestanggal 22 Nopember 2012
- Bali, Astro. 2009. “Bali :tempatwisata, Sejarah, Geografis, danPenduduk Bali”. Tersedia pada [file:///Balitempatwisata, Sejarah, Geografis, danPenduduk Bali.Com.htm](file:///Balitempatwisata,Sejarah,Geografis,danPendudukBali.Com.htm). (diakses tanggal 20 Nopember2012).
- Tjiptono, Fandy.2005.*Strategi Pemasaran,Yogyakarta:Andi*.
- Kong, Wai. 2011. “PengertianIstilahTabung Sungai”. Tersediapada<http://www.be-a-traveler.com/bat/articles/tubing/tubing.shtml>.(diakses tanggal 21 Nopember 2012).
- Kotler, Philip.2003.*Manajemen Pemasaran*. Jakarta:Erlangga.
- Okezone, Pasha Ernowo. 2011. “Selancar Air Dengan Tubing”. Tersediapada<file:///seluncur-air-dengan-tubing%20penting%20ajaan.htm>. (diakses tanggal 20 Nopember 2012).
- Penny, JC.2010.*Implementasi Pemasaran*. Yogyakarta:RinekaCipta.

PT. Sari Profit. 2010. Upaya Pengelolaan Lingkungan Hidup (UKL) dan Upaya Pemantauan Lingkungan Hidup (UPL). Gianyar.

Saputra, Irdana. 2009. "PariwisataOlahraga". Tersediapadafile:/// pariwisata-olahraga.html. (diakses tanggal 20Nopember 2012).

# **THE IMPORTANCE OF EMOTIONAL MATURITY AND THE ABILITY TO THINK POSITIVELY FOR ATHLETES**

**Komarudin**

**Yogyakarta State University, Indonesia**

## **Abstract**

Sport Athletes is part of a group of people who have a duty and responsibility to life, the athlete is also the next generation to continue the development of the nation and the state in the future, especially in the field of sports achievement. To form a human athlete in order to be of good character is not as easy as turning the palm of the hand. Reality on the ground stated that not all athletes can excel and formed in accordance with the expected character. Failure occurred not possible formation of emotional maturity and lack of power of positive thinking in athletes. Emotionally unstable and cause hardship concentration affect an athlete's achievement, while positive thinking can provide that much power for athletes in running a game or in another life.

Sports activity has a purpose that is comprehensive which includes aspects of physical, cognitive, affective, emotional, social and moral. Sports is a process of interaction between humans and the environment are managed through motion activities systematically to form a whole person, which is to develop the physical, psychomotor, cognitive, and affective aspects. One aspect that directly affective development in sport is emotional maturity and positive thinking.

**Keywords:** emotional maturity, positive thinking, youth and sport

## **INTRODUCTION**

Human resource is one of the development potential for the advancement of the nation. Its human resource is not limited to human adults, but also teenagers as part of a community member who has a relatively large number of full potential will play an active role in national development in the future.

Emotion is something that adds to the atmosphere of the individual's life is more "unfeeling". Emotional state can be a major influence on the level of individual energy, anger can be exhausting and often waste so much energy when emotions are heightened. Anger, resentment, anxiety, fears and feelings (emotions) can create a negative other large hole in one energy bin and quickly drain his life. Already a general tendency to connect the way how people feel with certain aspects such as mood changes, fluctuations, hormones and more specific external events.

In fact, feelings are 'dramatic' as boredom, indifference, do not want to know, and haphazard, will slowly suck the energy that has gone. In contrast, other feelings such as, honey, love, happy, to strengthen and develop the human energy system. Any negative feelings experienced during this life often requires a great effort to get out of his net. Various methods are used, however, always fail because all this seems excessive emotion always considered negative (pathogenic). Do not try to find the solution in psychology in general certainly will not find it because this sort of thing is called a negative psychological (emotional) because to dwell on the negative side of man, which is so far the study of psychology in general.



Psychology offers a reduction of this type of psychiatric problems. In fact, humans are not just simply need free of problems. Humans also need to fill her life with happiness. Negative emotions pathogenic looks like it could be converted into a positive emotion if we know that the force will be positive.

Human resource is one of the development potential for the advancement of the nation. Its human resource is not limited to human adults, but also teenagers as part of a community member who has a relatively large number of full potential will play an active role in national development in the future.

## **EMOTIONS**

### **1. Definition Emotions**

Emotion comes from the French and Latin that means interfere with or disrupt (Manz , 2007) and according to The New World Dictionary defines emotion as 'any particular feelings; every variety of complex reactions with both embodiments are physically and mentally'. The word emotion is a loan word from the English language, the 'emotion'. In the dictionary, the word 'emotion' is used to describe a strong sense and feeling that something very pleasant or very disturbing. For example, a strong feeling and fun moments with someone, maybe it that the self is in a state of emotion.

Type, the emotion of love. Another statement stating that the emotions triggered by one's interpretation of an event, the presence of a strong physiological reactions, emotional expression based on genetic mechanisms, is information from one person to another, and help one adapt to changing environmental circumstances. (Manz, 2007).

### **2. Division of Emotions**

Emotions can be divided into positive and negative values. Among them there is value neutral. Neutral emotion is emotion categories unclear position. Sometimes it can be a positive emotion can sometimes be as negative emotions, such as surprise and wonder.

One way that is used to determine whether or not a person happy in life is to ask them. Subjective well-being is the assessment in individuals about their lives, including two common variables:

- Emotional well-being, a balance of positive affect. Positive emotions play a role in triggering the emergence of emotional well-being and facilitates the setting of negative emotions and negative affect which includes satisfaction with life (life satisfaction) and happiness.
- Positive functioning, including psychological well-being and social well-being. The components of psychological well-being is a personal growth, life purpose, has a positive relationship with others, acceptance of self, the mastery of the environment, and otonomy. While the components of social well-being include social integration, social coherence, social acceptance, social actualization, and social contributions.\

### **Happiness**

Happiness is associated with well-being. HaidarBagir defines happiness as follows:

1. Welfare (well-being),

The satisfaction or fulfillment of the things that are important in life (external). His opponent is the absence or deficiency (deprivation) these things. Happiness is closely related to the fulfillment of desires in life; and usually when that desire is not fulfilled then there is unhappiness. The first definition expresses happiness that is influenced by external conditions; happiness seen based on an event that is fun.

Positive and negative emotions greatly affect a person's sense of well. People who have a lot of positive emotions and less negative emotion is usually the people who are happy or prosperous in life. While those who have more negative emotions less prosperous life.

2. Willingness.

The state in which a person is (internally). His opponent is restlessness or anxiety. Terms of internal happiness, happiness is no longer seen as the influence of external conditions but happiness seen from our view of the external conditions. How does our perception of an event and how we react to an event.

3. Feeling to know the meaning of life.

Namely the ability to make sense of life. The third definition is often also referred to as enlightenment or also commonly referred to as spiritual intelligence.

### **Life satisfaction**

In addition to emotions, feelings of well- defined also by life satisfaction. If a person feels that his life is satisfactory overall, as a decent income and good health he will experience peace (happy life). And conversely someone who has little income and poor health are not satisfied then looking at life. In short, someone who has a high degree of feeling prosperous is he who satisfied with his life, many experience positive emotions and less negative emotions experienced.

That happiness and satisfaction depend on the amount of fun and happy moments (in compton, Diener, 1984). Theory can be divided into two, namely:

1. Theory bottom up, where welfare is the sum of the positive experiences in one's life. The theory assumes that people create personal judgment about subjektivewell being by adding a wide variety of external circumstances and make a judgment. The more fun which events experienced by a person, then the person will be happy.
2. Theory top-down, supported by certain personal properties, behavior and personal perceptions so relate to one's personal assessment of well-being. Effective emotion regulation has shown can significantly enhance learning, according to research that positive emotions can have a positive influence on problem solving whereas negative emotions even hinder solving the problem.

### **3. Managing Emotions**

Negative emotions need to be managed properly, so that the energy generated can direct individuals to produce something positive. According to some studies, positive thinking does not give much impact on emotional state, this happens because it ourselves accustomed to thinking in negatives. While individuals do thinking Positively then bring all the parts of ourselves to share thinking positive. Later the next decision is taken will be more clear and unhurried atmosphere will be lost. So that the impact of action taken will be better later.( e - psikologi.com,2006).

Perceived impact:

Recognizing the positive thinking deeply ([www.vavai.com](http://www.vavai.com))

1. Viewing the problem as one of the challenges.

Positive thinking people always see problems as challenges to be faced. Whatever the problems faced not make him feel weak, but the spirit form to solve the problem. Energy that will never run out so he is always ready to face any problems. Those who think positively: See problems subjectively

The problem is a challenge that needs to be resolved immediately, without delay it

Take initiative to resolve problems

2. Enjoying life

People think positive always has time for himself doing little things meaningful to him. He enjoyed every job given to him and do it with sincerity that he should finish well. Those who think positively: Grateful for the time he had Can enjoy the world around them as a boon. Never regret what has occur in the past and currently.

3. Openness to ideas and suggestions from others.

People always think positive can receive suggestions and ideas from others. Criticism received is not threatening him, but a consideration for him to do the best.

Those who think positively: Can accept others with all its shortcomings. Not being distracted by all the criticism against him.

4. Constructive mindset.

Positive thinking people are always open to new things , but full consideration will be logical and not be hasty in making decisions . The attitude of caution and consider a lot of things is the first step in making decisions . People like this are not slow and not responsive to the little things. Those who think positively: Seeing the problems carefully and good judgment. Can make the appropriate decision making.

5. Against the negative thoughts that can damage healthy mind.

Negative thoughts are not only destructive energy it has, but it can also inhibit creativity thinking. Those who always think positive always has a way of fighting negative thoughts that arise in a certain way so as to make it be quiet. Those who think positively: Can discard the negative emotions that can hinder personality. Experiences to be able to separate all forms of negative emotions related to the development of her. Can see the difference that separated the problems that arise, so as not to mix the two different conditions.

6. Grateful for what he already has.

Happiness is not so much what they have , they are thinking positively always be grateful for what they have done today. The results are not priorities for them. At least they have done their best and be grateful for what is already his. Those who think positively: Happy and grateful to all who have had. Does not depend on the material can see the world with a different lens.

7. Steer clear of gossip.

Gossip will make someone not be objective when dealing with conflict. Positive people can distinguish between conflict and attitudes that are not in place. Assessment of the problem becomes clearer without interfering with other

people's suggestions. Those who think positively: Have strong principles and strong reasons. Caring for others does not mean want to interfere with other people's problems. Regard gossip as a waste of time and of no benefit to him.

8. Focus on problem solving

Positive thinking people will not let his mind constantly filled with negative things. Failure did not stop in doing a thing, let alone find a reason to use as the cause of the failure. He will not look for scapegoats from the mistakes made. Those who think positively: Responsive to existing. Involve yourself not away from it and innovative initiatives to problems and conflicts.

9. Uses positive language

This means that people think positive always use positive language as well as a driving force of motivation. To evoke the spirit for himself and others and use language that is optimistic. Those who think positively: Using positive language and honest. Using a time for self- statements to support positive attitudes and behaviors.

10. Uses positive body language

They are the ones who live with using the whole of his body to express the spirit, enthusiasm and friendship with others. He was always able to smile and talk with regular and proper intonation so that people can feel comfortable around him. Those who think positively: energetic enthusiastic. Posture support any movement or behavior.

11. Acceptance of self

Positive thinking people do not become a barrier body as their activity. They receive their physical form under any circumstances. They cared about how neat that can increase confidence and always trying to look better. Those who think positively: Receive him with all the advantages and disadvantages that exist in her. Confidence feel able to its ability.

12. Introspection

Seeing the problems focused on him, not blame others or seek out the cause of the problem. Disadvantages that spur him to do better, to forgive himself who has made a mistake and always tried to do the best for himself and others. Those who think positively: Can forgive him the mistake he had made. Making mistakes as a reference to be better.

## THE POWER OF POSITIVE THINKING

Brain and the human soul and progressing towards the continuous improvement process. Brain cells continue to grow or shrink along with one's thoughts and actions. If a person thinks and do what is beneficial to the high quality, the number of brain cells will proliferate. Conversely, if the thinking and doing useless poor quality, then there is a shrinkage of brain cells. For the brain, actually between thinking and doing is no different. When a person thinks, comes the electrical signals. Similarly, when a person is doing, it also gave rise to electrical signals. The 'world brain' is no more just world that contains electrical signals. Well when she was instructed to analyze, think, reflect, speak, see, hear, emotional, and moving or running. Everything is no more just a mere electrical signals, which ordered the other organs to react. (Noback, Demarest. 1993).

If we think and do evil and are in a condition of negative emotions, the brain cells will gradually deteriorate in line with the duration of the activity and the brain also releases cortisol effect that constantly produced (as is often angry, often jealousy, envy,

etc.), making stamina down, it could cause a blockage in the blood vessels (so that eventually could stroke), and cause many other diseases. Conversely, if individuals think and do good, nerve cells will proliferate and secrete serotonin brain will also be able to repel the effects of cortisol. Nerve cells that multiply the power that is going to increase brain power and Soul aka someone. Because the brain power along with the number of nerve cells that form the more perfect. One of these efforts is to produce serotonin healthy laugh (Princess, 2006)

Individuals who always called positive thinker positive thinking. Positive thinking is the best choice for everyone in every situation. Positive thinking is in favor of any that are positive and better. Positive thinking always produces a positive output and bring individuals more steady and stable in the face of unfavorable conditions.

Positive -minded people always follow a game plan in life. If we wait for life to bring us to a place, we will fall into the trap that too many expectations and be disappointed quickly. With the set concrete and realistic goals, individuals have made themselves a standard to achieve a clear time period. The first time an individual reaches the goal, positive thoughts will begin to emerge with the capability and skill. And best of all is the confidence level. Success and happiness is a positive thing. So if people want to be successful and happy, think positive.

## REFERENCES

Compton, William C., 2005. *An Introduction to Positive Psikologi*. Thomson Wadsworth : Belmont, USA

Firliana Putri, 2006. *KekuatanBerfikirPositif*. [www.daruttauhid.com](http://www.daruttauhid.com)

Lopez, S.J. & Synder, C.R. 2003. *Positive Psychological Assesment*. Washington, DC: American Psychological Association.

Manz, Charles C., 2007. *ManajemenEmosi*. Diva PressGroup :Jogjakarta

Noback, C R., 1993. *The Human Nervous Sistem*. (edisibahasa Indonesia). EGC : Jakarta

Ryff, C. D. 1989. Happiness Is Everything, Or Is It? Exploration on the Meaning of Psychological Well-being. *Journal of Personality and Social Psychology*, Vol. 57, 6, 1069 – 1081.

[www.vavai.com /blog/index.php?/archives/162-Berpikir-Positif-Positif-Thinking](http://www.vavai.com/blog/index.php?/archives/162-Berpikir-Positif-Positif-Thinking).

# THE EFFECTS OF TRAINING AND ACHIVEMENT MOTIVATION ON VERTICAL JUMPING ABILITY

Muslimin

Bina Darma University Palembang, Indonesia

## Abstract

Based on the field observations, it shows that jumping ability of male volleyball player in BinaDarma University Palembang still low. This research is purposed to find out the effects of training and achivement motivation on vertical jumping ability of male volleyball player at Bina Darma University. The type of this research is Quasy experiment. Population in this research is male student of Bina Darma University whose entering volleyball extracurricular and it is amounted to 84 persons. While, samples in this research, after divided into two groups that are high achievement motivation category (27%) and lower achievement motivation category (27%), are amounted to 44 persons. Instrument in this research is vertical leap test. Data were analyzed by two ways variant analysis technique. Results from the analysis indicating: (1) different result on vertical jumping ability between group with plyometric training method and weight training method, (2) interaction between training methods and achievement motivation on jumping ability, (3) in high achievement motivation category, groups with plyometric training method ( $A_1B_1$ ) have better result than groups with weight training method ( $A_2B_1$ ), and (4) in lower achievement motivation category, groups with weight training method ( $A_2B_2$ ) have better result than groups with plyometric training method ( $A_1B_2$ ).

**Keywords:** Training, Achievement Motivation, AbilitySkipVertical.

## INTRODUCTION

Sport is a human activity that can not be left out in everyday life . Sport has the goal of maintaining and improving health and fitness , achievement , human qualities , inculcate moral values and noble character , sportsmanship , discipline , strengthen and nurture national unity , strengthen national resilience , as well as lifting the dignity and honor of the nation (Undang-undang No. 3 tahun 2005 tentang Sistem Keolahragaan Nasional).

One sport that is very popular in the community is a game of volleyball . Volleyball game was played the ball to the opponent through a barrier in the form of a rope or net and trying to win the game by turning the ball in the opponent ( M. Yunus , 1992:1 ) . Means playing a volleyball game / bouncing the ball before the ball falls or before the ball hits the floor . This game is a team game ( team ) . At the volleyball game , there are some basic techniques that must be mastered by people who would do this game is service , passing , bait , smash , weir / block . Of several techniques that volleyball game , to be able to execute it properly would have to be supported by good physical condition by the player .

Ideally , a volleyball player should have good basic technical ability , physical and mental condition in order to perform well . One is the physical condition of the players must have the ability to jump vertically . Players who have a good vertical jump ability , it will affect the smash technique or a good block . Due to smash that with perfect technique then it should be supported with a high vertical leap . Good physical

condition is a key requirement for mastering technique and develop a skill sport . A speaker ( smasher ) in a volleyball game will not be able to hit the ball well and hard at the top of the net when the player does not yet have a high stepping strength , speed , and flexibility of the body is good . Likewise when doing a jumping service technique , a player must have the ability to skip vertical jump good to grab the ball from the highest point it throws then hit the ball towards the opponent's field , so it will be difficult for opposing players to do well passing . As the development of the current techniques , the player who has the ability to be profitable jumping service good for the team , because the service is the initial attack of the game .

Based on data from field observations , researchers found problems faced by volleyball players Universitas Bina Darma male Palembang is still low ability of vertical jump volleyball players Universitas Bina Darma 's son when doing a smash , jumping and block service . As a result of the lack of good players in performing the vertical jump , it will be able to affect the smash , jumping block. Someone service and volleyball players are required to have good vertical jump to smash , block and jump serve . However, men's volleyball player of Bina Darma University Palembang not have the ability to jump high current smash , jumping service and block , because the volleyball game volleyball player , especially a player should be able to son over the net height of 2.43 m from the ground .

Based on the vertical jump test data volleyball player son of Bina Darma University Palembang is still a lot of players who have low. To vertical jump can do smash , and a good block and directional a player must be able to perform a high vertical leap , in order to pass through the net and passed block is performed by an opposing player . But in fact men's volleyball players in the field of Bina Darma Palembang frequent failure to smash . The failure is caused by the low ability vertical yang jump owned . Therefore, it will lead to a defeat for the team alone . Besides training program provided by the coach less than the maximum as well as the methods given too monotonous , so the players feel tired and less motivated to follow the training program given by the coach . So that will have an impact on the outcome of the exercise was not optimal .

One of the factors that support successful vertical jump is explosive leg muscle power . Explosive leg muscle power is one of the important components in activity sport biomotoric , because the explosive power will determine how hard the person is hit , how far throw , how high jumps , and how fast to run and is one of the important aspects of the physical condition of doing leap in doing vertical will jump smash or jumping service in volley ball games . To get the good exercise , proper training methods are needed . The ability of the coach becomes very important , knowledge and skills to be possessed , to the detailed things about the sport he coached . Heavy duty coach lies in the ability to design and develop appropriate strategies , how to spur his players to be totally involved in the preparation period training with the best .

To improve vertical jump can be done by using some form of exercise , which include plyometrics exercises and training burden . Practicing with plyometrics exercises is tantamount to a form of exercise plyometrics sports that require a high explosive movement . Many forms of plyometrics exercises are often used by coaches to improve vertical jump . Because plyometrics exercise is very effective for improving vertical jump ability players . Then, almost all movements in plyometrics exercises lead to movement in the vertical jump vertical jump ability to measure leg muscle which is owned by the player . Because in almost plyometrics training involves muscle

movements of the body, and explosive movements are coordinated stepping movements with the arm swing both legs were very helpful to speed up the movement of the stepping motion that got explosive speed .Load-bearing exercises are exercises that use loads other than their own body weight as a tool to improve strength and speed .

Weight training exercise is any form of demands and characteristics of stimuli , both stimuli from inside or outside stimuli given to the athlete in a training process that can lead to the effect of exercise . Demands and stimuli are referred to in the form of demands and physical stimuli and may also be in the form of psychological stimulation ( mental ) . In addition to using the proper training , volleyball games can also be affected from the psychological aspect , because in a game that competed , psychological readiness factors also play an important role for the implementation of engineering skills in the game of volleyball . One of these is askpec achievement motivation . Achievement motivation is an athlete impetus owned in following sports volleyball training activities to achieve the feat . In this case the motivation is associated with seriousness and determination of athletes to exercise with diligence and passion . Conceptually berprestai athletes who have high motivation to have success in doing a better workout .Conversely , if a low motivation to training is feared to affect the results of the exercise are difficult to achieve.

### **Skip Essence Vertical.**

Vertical jump is an act of the central body lift stand to gain up using leg muscle strength , which is a measure of how high a person is able to lift itself growing from the floor in a standing position . Skip vertical motion could also be interpreted as high jump with a focus on leg muscle strength to achieve stepping straight up to the maximum . Vertical jump is what is one of the critical success factors in the block and smash or jumping service . If a player can perform a high jump vertical, then the player will be able to smash when the ball is above the net , and can drive the ball as desired in order to pass block performed by opponent players. Faktor - factor that determines the vertical jump by Markworth in Syafruddin ( 2006:40 ) vertical jump ability depends on ( 1 ) muscle strength , ( 2 ) the role of muscle contraction speed , ( 3 ) the magnitude of the driven load , ( 4 ) inter-and intra- muscular coordination , (5) muscle length on when contraction and ( 6 ) the joint angle .

### **The Nature of Plyometrics Training.**

According to Chu ( 1996:81 ) defines plyometrics are specific exercises that train your muscles to produce maximum force more quickly . Maximum power is generated in a time that is unbelievably fast called explosive power or explosive power .Plyometrics exercises are exercises used to train the muscles to produce maximum power ( explosive power ) very quickly with the specific characteristics of muscle contraction which is very strong response of dynamic loading which is an important component for performance athletes . Most movements resulting from the reaction preceded by concentric and eccentric contractions of the opposite movement consetric can produce a high -speed movement . All training is done with the cycle pliomterik muscle lengthening ( eccentric ) and shortening ( concentric ) . The purpose of plyometrics exercise is one method to train in order to increase the explosive power that trained muscle . As is the case with other forms of exercise are other , plyometrics exercise also has the purpose of helping players to be able to develop the skills required at each power branch olahraga.Bentuk - form plyometrics exercises used in this study



are as follows : 1 ) . Quick leap , 2 ) . Jump to box , 3 ) . Double leg stairbound , 4 ) . Single leg hops , 5 ) . Duble leg hops , and 6 ) . Lateral cone hops .

### **The Nature of Weight Training.**

Weight training exercise is generally known as a form of exercise that uses external loads other than their own body weight like a barbell , dumbbell etc . According Harsono( 1988:185-186 ) method is overloaded training exercises in which the load is only used systematically as a tool to increase muscle strength achieve to certain destinations . The load-bearing exercise , if done right unless it can fix the overall physical condition , will also be able to develop speed , power , strength , and durability . The physical conditions are needed by an athlete to improve the interpretation of exercise .Various load-bearing exercises used in this study are : 1 ) Half Squat , 2 ) . Inverted leg presses , 3 ) . Dumble leg presses , 4 ) . Leg extension , 5 ) . Leg flexion and , 6 ) . Split squats .

### **The Nature of Achievement Motivation**

Achievement motivation is an encouragement that is owned by someone , either boost that comes from within the person as well as encouragement from outside the person to be able to achieve the desired achievement . According Setyobroto ( 2001:24 ) revealed that achievement motivation is the desire , the desire , the will , and the driver to be able to excel , surpass that achievement ever achieved alone or achievements of others . Meanwhile, according Setiadarma ( 2000:73 ) " achievement motivation ( achievement motivation ) is the orientation of a person to keep trying to get the best results as possible with the basic ability to survive even fail and keep trying to do their best work , because he felt proud to be properly finish.

## **RESEARCH METHODS**

This research is a quasi experimental ( quasi -experimental 2x2 factorial with study design).

**Table 2 x 2 factorial design**

Achievement motivation	Training	
	Plyometric	Weight training
Hiegt	A <sub>1</sub> B <sub>1</sub>	A <sub>2</sub> B <sub>1</sub>
Low	A <sub>1</sub> B <sub>2</sub>	A <sub>2</sub> B <sub>2</sub>

The population in this study is that students who take part in coaching achievements totaling 127 sons and daughters. Sampling technique in this study is the use of purposive sampling technique that is based on sampling a particular consideration of the researcher . Based on this, the researchers determined the sample in this study group of 84 men's volleyball players . Based on the percentage techniques that total sample result of 44 people were divided into 4 groups of cells .After the division of the sample then the sample was treated as 16 sessions . Further tests carried out after the end of treatment was given to four groups , two groups of plyometrics exercises on high achievement motivation category ( A1B1 ) and low ( A1B2 ) , then the two groups for

the training burden on high achievement motivation category ( A2B1 ) and low ( A2b2 ) given training in accordance with the designed program .

The data obtained will be processed by analysis of variance ( ANOVA ) followed by two lines and if found Tuckey test the interaction between variables training method with variable achievement motivation . Therefore, this study used a 2x2 factorial design , the data analysis using ANOVA technique two lanes , with a confidence level  $\alpha = 0.05$  . Before the data were processed using Analysis of Variance techniques , first tested the requirements of ANOVA , namely the normality test using the Test and Test of Homogeneity of Variances Liliefors using Bartlet test with significance level  $\alpha = 0.05$  .

## RESULTS AND DISCUSSION

Based on the results of the normality test calculations to eight groups over the study design was found that the price L obesrvasi ( Lo ) earned less than the price L tabel on the real level of 0.05 . It can be concluded that all groups of data in this study were drawn from a population that is normally distributed so that it can be used hypothesis testing research .Hypothesis testing of this research was done by using ANOVA two lanes . Further testing was then performed using Tuckey test . The use of two lanes ANOVA technique aims to determine the individual contribution of the independent variables on the experimental results (main effect) and to determine the effect of the interaction ( interaction effect) . The main effect in this study were ( 1 ) differences in the effect of plyometrics training methods and training methods berbeban terhadap vertical jump ability , and ( 2 ) the effect of the interaction is a combination of training methods and achievement motivation on vertical jump ability .

Based on the summary of the ANOVA calculations above two lines can be stated that : 1 ) the alternative hypothesis ( Ha ) states that there are differences in the effect of training methods between groups with plyometrics training methods and training methods acceptable burden , because the results of the calculations show that the F value = 4.84 > F = 4:05 . 2 ) the alternative hypothesis ( Ha) states that there is an interaction between training method and achievement motivation with the ability to jump vertically received , as the result of the calculation shows that F value = 41.33 > F = 4.05 .

With demonstrated research hypothesis which states that there are significant interactions and achievement motivation training methods need to proceed with the analysis Tuckey test . Summary Tuckey test results are presented in the table below:

**Table Results of ANOVA with Test Tuckey Next Phase**

Group compared	Dk	Q <sub>h</sub>	Q <sub>t</sub> ( $\alpha = 0.05$ )	Ket
A <sub>1</sub> dan A <sub>2</sub>	1.05	3.11	2.92	significantly
A <sub>1</sub> B <sub>1</sub> dan A <sub>2</sub> B <sub>1</sub>	1.49	8.63	3.77	significantly
A <sub>1</sub> B <sub>2</sub> dan A <sub>2</sub> B <sub>2</sub>	1.49	4.23	3.77	significantly

Based on the results of further trials using the Tuckey test can be stated that :

1 ) . The first research hypothesis stating that plyometrics training methods ( A1 ) results are more effective than the method of load-bearing exercise ( A2 ) is received . The mean score of group training methods A1 = 116.05 higher than the mean score training methods A2 = 112.77 ( Q<sub>h</sub> = 3:11 > Q<sub>t</sub> = 2.92).

2 ) . The third research hypothesis which states that the high achievement motivation training methods plyometrics ( A1B1 ) the result is more effective than exercise burden ( A2B1 ) is received . The mean score of the sample training methods A1B1 = 122.08 group was significantly higher than the mean score of group training methods A2B1 = 109.24 (  $Q_h = 8.63 > Q_t = 3.77$  ) .

3 ) . The fourth research hypothesis which states that the low achievement motivation , methods of group exercise training methods plyometrics ( A1B2 ) is lower than the results using the method of load-bearing exercise ( a2b2 ) is received . The mean score of the sample group training methods a2b2 = 116.30 higher than the mean score of group training methods A1B2 = 112.77 (  $Q_h = 4.23 > Q_t = 3.77$  ) .

Based on the data analysis of the first research hypothesis suggests that exercise pliomterik results are better than burden the exercise . The mean score of group training methods A1 = 116.05 higher than the mean score training methods A2 = 112.77 (  $Q_h = 3.11 > Q_t = 2.92$  ) .

The test results showed that exercise plyometrics hypothesis gives better results in improving vertical jump ability than weight training. Coz plyometrics movement characterized by the implementation of identical vertical jump .Where movements performed at high speed and maximum strength and muscle coordination arm contributed to skip to accelerate the movement of two legs. While the load-bearing exercises are exercises that are used to increase the strength and speed , if trained properly will produce endurance , and explosive power . Exercise dominant overloaded muscles locally trained , and the load used is external load other than its own body weight .Based on the data analysis of the second research hypothesis alternative hypothesis (  $H_a$ ) states that there is an interaction between training method and achievement motivation with the ability to jump vertically received , as the result of the calculation shows that  $F \text{ value} = 41.33 > F = 4.05$  .

The results of hypothesis testing to show that there are two methods of training and interaction between achievement motivation in improving vertical jump ability . Due to the implementation of the exercise requires good level achievement motivation . So that when the players practice implementation , the player can perform tasks with the spirit of the exercise movement . So from the results of the training process can players improve and achieve the desired achievement .

The third research hypothesis which states that the high achievement motivation training methods plyometrics ( A1B1 ) the result is more effective than exercise burden ( A2B1 ) is received . The mean score of the sample training methods A1B1 = 122.08 group was significantly higher than the mean score of group training methods A2B1 = 109.24 (  $Q_h = 8.63 > Q_t = 3.77$  ) .

Results of testing the third hypothesis states that the high achievement motivation category using plyometrics workout results are better than burden the exercise . Achievement motivation a player then the player will be able to carry a maximum plyometrics exercises, plyometrics exercise because the movements require high-speed and powerful . Thus a player who has high achievement motivation given category will receive training plyometrics training and obtain better results than the training burden .

The fourth research hypothesis which states that the low achievement motivation , methods of group exercise training methods plyometrics ( A1B2 ) is lower than the results using the method of load-bearing exercise ( a2b2 ) is received . The mean score

of the sample group training methods  $a2b2 = 116.30$  higher than the mean score of group training methods  $A1B2 = 112.77$  ( $Qh = 4.23 > Qt = 3.77$ ).

From the results of the fourth hypothesis states that the opposite occurs, the low achievement motivation category loaded exercise group were given a better result than the group given plyometrics exercises. Because the entire load-bearing exercises are not done with explosive movements, there is no coordination of all the muscles of the body, muscles trained local muscles, as well as the load applied external load other than its own body weight. So at the low achievement motivation fit berban use the exercise. Because it does not require a high motivation to perform exercise movements loading.

## CONCLUSION

Based on the research findings and discussion of the research results can be summarized as follows:

1. Influences of an increase in vertical jump ability between groups were given training and plyometrics exercise group given burden.
2. There is interaction between training method and achievement motivation to increased vertical jump ability.
3. At high achievement motivation category, exercise is more effective than exercise pliomterik burden to increase vertical jump ability.
4. At low achievement motivation category, laden exercise is more effective than plyometrics exercises to increase vertical jump ability.

## SUGGESTION

Based on the conclusions and implications of the above, are expected to:

1. Trainer, in an effort to improve the ability vertikalpemain indispensable jump in volleyball game better, you should use a more precise method of exercise and good. In an effort to improve the vertical jump, the trainer can use plyometrics exercises and training burden.
2. Player who has a high level of achievement motivation, using plyometrics exercises will provide improved vertical jump ability is very effective.
3. Player who has a lower level of achievement motivation, using the training burden will have an effective impact on improving vertical jump ability.

## REFERENCES

- Chu, Donald A. 1992. *Jumping Into Plyometrics*. Champaign, Illinois: Leisure Press.
- Harsono. 1988. *Coaching danAspek-aspekPsikologisDalam Coaching*. Jakarta: P2LPTK.
- Markworth, Peter. 1983. *Spotmedizin*. Hamburg: Rowohlt Taschenbuch Verlag GmbH.
- M. Yunus. 1992. *Olahraga Pilihan Bolavoli*. Jakarta: Depdikbud.
- Satiadarma, Monty P. 2000. *Dasar-dasar Psikologi Olahraga*. Jakarta: Pustaka Sinar Harapan.

Setyobroto, Sudibyo. 2001. *Mental Training*. Jakarta: Unit Percetakan Universitas Negeri jakarta.

Syafruddin. 2006. Pengaruh Metode Latihan Sirkuit dan Berat Badan Terhadap Daya Ledak Otot Tungkai. *Disertasi*. Jakarta.

*Undang-undang RI Nomor 3 Tahun 2005 Tentang Sistem Keolahragaan Nasional*. 2007. Biro Humas dan Hukum Kemenpora RI.

# INTEGRATED PHYSICAL EDUCATION IN THE CONTEXT OF 2013 INDONESIAN PRIMARY SCHOOL CURRICULUM

Soni Nopembri<sup>1</sup>, Saryono<sup>2</sup>, and Ahmad Rithaudin<sup>3</sup>

Yogyakarta State University, Indonesia

## Abstract

In the 2013 Indonesian curriculum, it is permitted to integrate of basic competencies between the subjects with other subjects in elementary school. This integration is implemented in an Integrative Thematic approach that is expected to develop a holistic student aspect. Integrated physical education is a model that has the approach to integrate physical education with other subjects. Therefore, the need for research to determine the fit between theory, concepts, and structures of integrated physical education and 2013 Indonesian primary school curriculum in 2013. The study was a descriptive analytic qualitative approach. As a matter of analysis, this study uses the documents of integrated physical education model, like: books, journal articles, relevant studies and documents covering the 2013 Indonesian curriculum, like: structure of the curriculum, competency standards, core competencies, core competencies, guidelines, and Teacher Handbook (guide the learning process and guides the implementation of measurement and assessment of learning outcomes, and syllabus). Collecting data in this study is used the documentation techniques. Analysis of the data is used descriptive qualitative analysis of narrative that seeks to examine the data encountered. This study concludes that there is a correspondence between thematic integrative approaches in the 2013 Indonesian primary school curriculum and integrated physical education model. This specific is seen from the perspective of theoretical aspects, concepts, structures, and the scope and characteristics of learning. Thematic approach to integrative learning focused on science, while at integrated physical education focused on physical education. The results of these studies indicate the need for adjustments between models *Integrated Physical Education with an integrative teaching model that thematic similarities mentioned above can be implemented properly.*

**Keywords:** integration, curriculum, physical education

## INTRODUCTION

Physical Education can not be separated from the general education, but compared to the other study, it is really different. It makes student to be healthy. However, in reality, it is regarded as a boring and tiring subject that contradicted the basic concept of said education. Another fact is that there is no relation between the curriculum and the student's real life in school which is tended to be exclusive, narrow minded, too academic, and it looks like all students are directed to be a scientist (Siswoyo, 2004).

Physical Education takes two hours every week with every hour is consisted of 30-40 minutes. It does not really proportional to its main purpose. Wiryawan (2003) gives an example from a recent research in America shown that education which use curriculum with separated subject failed to maximally build the student self ability. Curriculum with separated subject in 50 minutes for every meeting becomes unrealistic. Student does not have more opportunity to learn something deeply. Schools tend to give more time for certain subjects. In elementary school, it hinders the children growth. It caused problem in educating progress if children does

not have enough time to move their body. Children cannot stop themselves from moving even in the middle of the class.

Organized, planned and well-guided Physical Education program hopefully could reach some set of goals like the optimal growth and development in physical, intellectual, emotional, social, and spiritual aspect. Referred to the importance of the children growth and development, an integrated Physical Education is needed. It is one innovation that would give children a media in doing activity which compatible with their need and interest. It also hopefully could give an idea to the teacher in creating educational progress into interesting activity that would keep the children happy and not burdened by the study material in the curriculum, especially facing the start of 2013 curriculum program.

The start of 2013 curriculum program gives a significant effect to many method and educational teaching model in elementary school. Development concept of 2013 curriculum has adopted various recent educational development especially in achieving competent graduate with good attitude, relevant skills, and related knowledge (Kemdikbud, 2012:15). The ideal concept of 2013 curriculum to the educational teaching process is focused on the student (Student Centered Active Learning) and contextual (Kemdikbud, 2012:15). Teachers are allowed to adjust their teaching according to the concept.

Physical Education becomes one of the subjects that are the integral part of all study matters in 2013 curriculum. In basic competency for elementary schools for 2013 curriculum is said that there is integration based on the close meaning of the competency content between Physical Education with other subject. Of course this integration needs a suitable process of planning, executing, and evaluating so the main goal of learning Physical Education and other subjects is related. It is suitable with the integrated Physical Education teaching model. Because of this, a research about the relation between integrated Physical Education with 2013 curriculum is needed. So the problem in this research is related with analyzing the compatibility between theory, concept, and integrated Physical Educational structure with 2013 curriculum in the teaching progress for elementary school level.

Teaching with integrated approach actually is not a new innovation in education especially in kindergarten and elementary level. John Dewey, an expert in modern America education already suggested the idea of the need for the implementation of an integrated approach to teaching and learning in children's education process since the beginning of the 20th century (Saud, 1997:2-3). However, integrated approach only gets the attention around 1970 as the alternative for the effective children teaching method after various researches proven how traditional teaching methods were failed in developing children optimally. Hopkin in Lutan (1994:26) furthermore explained that the aspects of integrated in education are psychological, sociology, and pedagogy, while integrated understanding is a process of seeing something as a whole or a single unit.

Integrated teaching itself is a teaching model that brings a relevant teaching situation which is meaningful to children. Integrated teaching is educating media which is effectively helped the children to learn integrated in finding connection and relation between what they know with new information or things they just learned everyday. Collins and Dixon in Sutresna, et al (2003) state that integrated learning as integrated learning occurs when an authentic event or exploration of a topic in the driving force in the curriculum. Furthermore, it is explained that in practice children could be asked to actively participate in exploring some topic or event, they could learn the process and content (matter) of more than one subject at the same time.

Integrated learning has some models as revealed by Depdiknas (2004). Integrated learning model in question include the following: First, integrated learning model between two subjects in the applied curriculum structure, for example between Mathematic with Indonesian Language and Matematic with Social Science, etc. Second, integrated learning model between one certain subject with learning material which cannot stand alone as a subject, like between Religious Education with Population and Environmental Education teaching material, Biology with Healthy Reproductive Education and HIV/AIDS subject material, between Civic Education with Character Building Education study material, Indonesian Language with Faith and

Devotion study materials, and so on. Third, integrated learning model with two or more subjects such as: Mathematic, Science, Social Science, Handicraft and Art, which combined into one learning activity project (project method). Forgarty in Sutresna, et al. (2003) stated that integrated model is a learning model which used an approach between study subjects. This model is sought by combining field studies by establishing curricular priorities and finds the skills, concepts, principles, and overlapping attitudes in several areas of study subjects.

Based on that statement can be drawn a conclusion that integrated learning has certain models that related to educational progress in school. Integrated learning is a combination between two or more related study subjects in school, which is combined into one learning scenario, for example in physical education that have a combination between basic locomotor movement with basic nonlocomotor movement. Integrated learning also a combination of study materials that exist in two or more subjects, combined into one learning at one integrated study subject, for example in a combination of basic jumping movement with basic numbers counting in mathematics, that done in Physical Education practice at field.

The concept of change in 2013 curriculum consists of some elements like how it is written in 2013 curriculum from Kemdikbud. Those elements are listed as the following: First, Graduate Competence, an increase and balance in soft skills and hard skills which include competence in attitude, skill, and knowledge. Second, the position of subject, the competence which originally derived from study subject changed into a subject whom developed from competence. Third, Thematic Integrative is Approach in all study subjects. Fourth, the structure of study subjects curriculum and time allocation, holistic and integrative focus to nature, social and culture. Teaching is held with scientific approach. Study subjects are reduced from 10 into 6. The hours increase into 4 hours per week due to the change in learning approach. Fifth, learning is progressive. Standard progress which originally focused on exploration, elaboration, and confirmations completed with analyzing, asking question, processing, reasoning, presenting, summarizing, and inventing. Learning not only happens in classroom, but also around the school ground and society. Teacher is not the only learning source. Attitude is not taught verbally, but by giving example. Learning is used Integrative Thematic approach.

Particularly, Ministry of Cultural Education has issued Basic Competency for Elementary School/Madrasah Ibtidaiyah as part of 2013 curriculum. It contains some element that is described specifically for the start of 2013 curriculum in Elementary School and Madrasah Ibtidaiyah. These elements include Curriculum Structure, Organizational Basic Competence in all Study Subjects, Main Competence and Basic Competence, Thematic Integrative Learning, Main Competence and Basic Competence in every Study Subjects.

Group A is the study subjects which gives more orientation competence to the cognitive and affective aspect while Group B is the study subjects which emphasized the affective and psychomotor aspect. Basic Competence Integration on Science and Social Science is based on the close relation of meaning from the content of Science and Social Science Basic Competency with Religious and Character Building Education, Civic Education, Indonesian Language, Mathematic, and Physical Education for class I, II, and III. Furthermore, for class IV, V and VI, Science and Social Science Basic Competency is stand alone then integrated into the themes for class IV, V and VI?

The burden of learning is expressed in every study activity for each week for one semester. The burden of learning in Elementary School/MI for Class I, II, and III, respectively 30, 32, 34 whereas for class IV, V, and VI, respectively 36 hours each week. Hours of study for Elementary School/MI are 35 minutes. With the additional hours of study and the reduction of the number of Basic Competencies, teachers have



the flexibility of time to develop a student -oriented learning process actively. Active student learning process takes longer than learning the process of delivering information because students need practice to observe, ask, associate, and communicate. The learning process requires the teacher's patience in educating students so that they become aware, able and willing to learn and apply what they have learned in the school environment and society. In addition, the increase in hours of study allows teachers to assess learning processes and outcomes.

Elementary School/MI curriculum is using thematic integrative learning approach from class I to class VI. Thematic integrative learning approach is study approach which integrates a variety of competencies of various subjects into various themes. The integration is done in two ways, namely the integration of attitudes, skills and knowledge in the learning process and the integration of the related basic concepts. The thematic is the basic meaning of various concepts so that students do not learn the basic concepts partially. Learning thus giving full meaning to the learners as reflected in the variety of themes available.

In thematic integrative learning, the theme is chosen with regard to nature and human life. For class I, II, and III, both of which are substantially the giver of meaning to Civic Education, Indonesian Language, Mathematics, Cultural Art and Craft, as well as Physical Education. This is where the basic competencies of Science and Social Studies are organized into other subjects have an important role as a binder and developer of Basic Competence for the other subjects. From psychological point of view, the students have not been able to think abstractly to understand content in separate subjects except for class IV, V, and VI which has begun to think abstractly. View of developmental psychology and Gestalt provides a solid foundation for the organized integration of basic competencies into thematic learning. From the perspective of transdisciplinarity then strictly dividing the curriculum won't provide benefits to the ability to think further.

There are many possibilities for linking Physical Education with other subject matter, especially for the early grades as integration with Arithmetic, Language, Outdoor Education, Social Education, and so on. Integrated learning of Physical Education can involve materials contained in other subjects in elementary school that is based on the basic competencies, indicators, and learning outcomes. In accordance with the structure of the elementary school curriculum in 2013, which included subjects in group A consists of: Religious and Character Building Education, Civic Education, Indonesian Language, Mathematics, Natural Science, Social Science, while group B consist of: Cultural Arts and Crafts, and Physical Education.

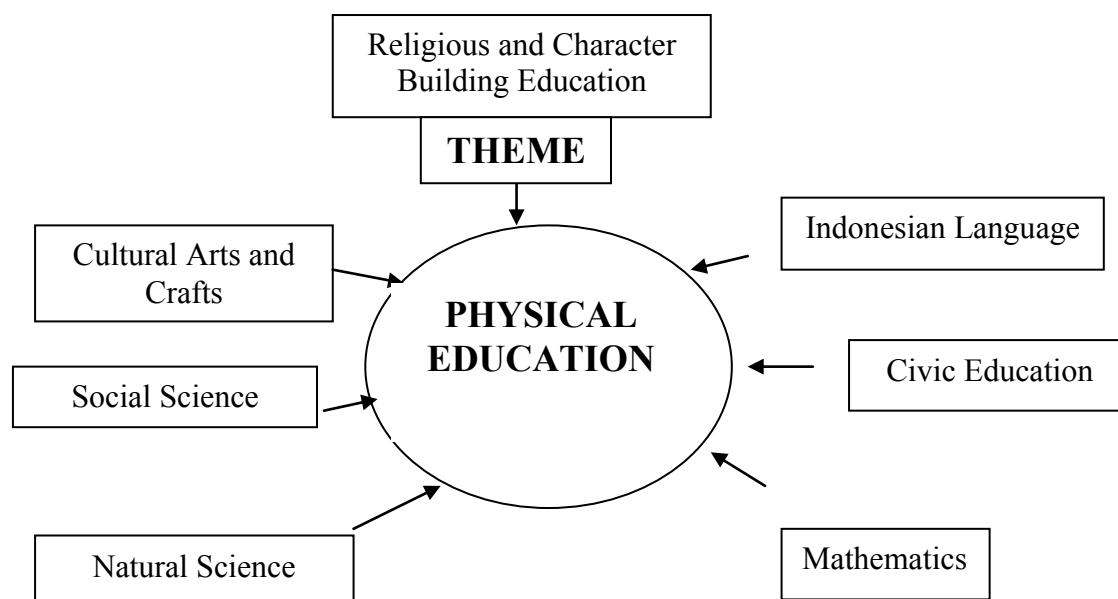


Figure 1. Integrative Thematic in Physical Education based on 2013 Curriculum

The materials contained within the others subjects can be involved in some Physical Education learning progress with relevant study materials. Materials within Physical education then chosen and combined with others materials from other subjects. 2013 curriculum also gives teachers an opportunity to build learning theme that includes several study materials in different study subjects, this model is called Thematic Integratve. For example, the theme in learning Physical Education is associated with basic reading and counting for elementary student. Learning Physical Education with other study subjects as part of the implementation of the Thematic Integrative approach as illustrated in Figure 1.

## RESEARCH METHOD

The research that used to finish this problem is by using anlitical description research with qualitative rapprochement. Descriptive research give the illustration about the situation and certain social indications. The illustration here is some suitability that indentified trough a deep analysis between integrated physical education concept and 2013 curriculum in study course Physical educationof elementary school. The subjects of this research is written documents about Integrated Physical Education such as : books, journals, and some relevant researches. Moreover, 2013 curriculum documents that included curriculum structure, a graduate's competency standard, main competency, base competency, and guidance and also teacher's guide book (a guide for doing learning process and guide to measure and rate study result, syllabus). The data collection in this research using documentation technique. The research instrument is a documentation guidance. The data is valid when there is no differences between the report that given by the researcher with the real condition of the researched objects. Reliability was shown as a complex reality, dynamic, so there is no consistence, and to repeat as what it is in the begining. The word that used to test the data validity and reability in qualitative research is different with quantitative research. The data validity test in this research includedcredibility test, transferability test,dependability test, and conformability test (Sugiyono, 2005: 121). The data analysis that used is qualitative data analysis to narative study result datas for researches that found.

## RESEARCH RESULT AND DISCUSSION

The result of the research shows that in general integrative thematic rapprochement with Integrated Physical Education has a suitability from theory, general concept, learning concept, learning characteristic, and the fold up. Theoretically, Integrative Thematic and Integrated Physical Education are due to constructive and humanism theory. They also based on theory assumption that says that children will grow up integratively so there is needed an integrative in learning to achieve comprehensive goal. Due to general concept, both rapprochement are based on integrated concept that integrate some course of study in a thematical learning. To be based on concept and characteristic of learning, it seem that integrative thematical rapprochement and Integrated/interdisciplinary Physical Education specialize on a learning that mix some course of study in a learning process to make a learning that centralize on students, can give a real experiments, flexible and suitable with the need and characteristic of the students. While in coverage side, both rapprochement have same coverage in the study courses in elementary school.

Integrative Thematic and integrated physical education have a same main theory, which is constructivistic that developed by Dewey, Piagne, and Vygotsky. Constructivistic theory in learning process was guided to connect between knowledge and reality (Housner, 2009). In this theoretical concept, students are considered as an active and constructive sense maker. Based on that theory, the Integrative Thematic learning process guided to theme usage that integrated some courses and so do integrated physical education that guided to integrated two or more study areas in an important relation in a way to increase and enrich learning process of students in every courses (Cone, et.al., 1998). Integration trough physical education has gained many attentions from class teacher and physical teacher. Move is an effective way to give integrative context, real, and authentic to enlarge and increase the learning process of students to the context that taken from another study area (Cone, et.al. 1998).

**Table 1. Main theory of Integrated/interdisciplinary Physical Education and Integrative Thematic**

<b>Integrative Thematic</b>	<b>Integrated/interdisciplinary Physical Education</b>
<ol style="list-style-type: none"> <li>1. Thematic learning is a study regarding a common theme as a unifier, as a main concern that used to understand indications and concept.</li> <li>2. Integrated learning process is oriented to learning process that included some courses of study that needed by children.</li> <li>3. Learning process that uses theme to connect some courses so that can give meaningful experiences to the students.</li> <li>4. Progressivism, learning process need to be emphasized in creativity forming, offering some activity, natural atmosphere, and observe the student experiences.</li> <li>5. Constructivism, children construct their knowledges through interaction with object, phenomena, experience and environments.</li> <li>6. Humanism, observe students from the uniqueness, ability, and motivation that they have.</li> </ol>	<ol style="list-style-type: none"> <li>1. Constructivists view learners as active and constructive meaning makers. Learning occurs best when students make connections between their previous knowledge and current learning, when students are actively engaged in learning process, and when students collaborate with their peers and teachers (Dewey, 1988; Piaget, 1970; Vygotsky, 1978).</li> <li>2. Interdisciplinary teaching is viewed as one of the effective learning approaches to meet the educational aims (Lancaster &amp; Rikard, 2002; Lipson, Valencia, Wixson, &amp; Peters, 1993).</li> <li>3. It integrates two or more subject areas into meaningful association in order to enhance and enrich students learning in each subject area (Cone, Werner, Cone, &amp; Woods, 1998).</li> <li>4. Interdisciplinary teaching through physical education has received a great deal of attention by K-12 physical educators and</li> </ol>

	teacher educators. Proponents view movement as an effective vehicle for providing integrative, concrete, and authentic contexts to extend and enhance students' learning of abstracted concepts in other subject areas (Christie, 2000; Cone et al., 1998).
--	---

Essentially, the rapprochement in Integrative Thematic learning process attempt to make and connect some different courses of study with an expectation that children will study better and meaningful through a theme that can unite the indicator from the course of study using webbed model. While integrated physical education that use three models in learning process such as :Connected Model, Shared Model, and Partnership Model. Those models are integrated models that considered by Robin Fogarty (Sutresna, 2003). Those mean, in Integrative Thematic rapprochement concept and Integrated Physical Education aim at one source. each model has its own good and bad, so that the use of it need to be adjusted with the purpose and the depth of the integrated that wanted.

**Table 2. General concept of Integrated/interdisciplinary Physical Education and Integrative Thematic**

<b>Integrative Thematic</b>	<b>Integrated/interdisciplinary Physical Education</b>
<ol style="list-style-type: none"> <li>1. Make and connect some different courses with a prospect that children will learn better and meaningful.</li> <li>2. The theme have a role as a unifier of learning process that blend some courses and also choose a theme that can unify the indicator from : religion, Indonesian Language, social science, civic education, science, art, physical education.</li> <li>3. webbed model, this model started from thematic rapprochement as a main guide material and learning process. The theme that had made before, can increase learning process, in its own course and between another courses. (Robin Fogarty, 1991).</li> </ol>	<ol style="list-style-type: none"> <li>1. Interdisciplinary teaching model: Connected model, Shared Model, Partnership Model</li> <li>2. Through interdisciplinary teaching in physical education, the primary focus of learning movement concepts and motor skills would be enriched and complemented.</li> <li>3. A supplementary focus of helping students make meanings of abstract concepts in another subject area also would be augmented and reinforced.</li> </ol>

The structure and purview of the Integrative Thematic rapprochement and Integrated Physical Education in learning process are having some similarities in a way to connect study courses. In the Integrative Thematic rapprochement learning process, all of the course that integrated are based on science (nature, social, and culture) so that the theme will be focusing on everyday life that connect with three basic of science. While on integrated Physical Education the base is Physical Education itself that integrated with two or more another courses of study. The purview has similarities in study course in elementary school such as Language Arts, Mathematics, Science, Social Science, and Arts.

**Table 3. Structure and Purview in Integrated/Interdisciplinary Physical Education and Integrative Thematic**

<b>Integrative Thematic</b>	<b>Integrated/interdisciplinary Physical Education</b>
Holistic based on science (nature, social, and	Physical education

art),total of the course is decreased from 10 to 6, while the time of study increased 4 study hours because of the change of the rapprochement learning process.	2 or more subject
All of the courses on grade 1 to 6 in elementary school such as : religious, Indonesian language, mathematic, science, civil education, social science, art, and physical education.	Physical education with: <ul style="list-style-type: none"> <li>• language arts</li> <li>• Mathematics</li> <li>• Science</li> <li>• Social Studies</li> <li>• Arts</li> </ul>

The characteristic on Integrative Thematic rapprochement of learning process and Integrated Physical Education have a relation in teacher's role and students. The characteristic on Integrative Thematic rapprochement which is focused on the children is flexible, study outcomes could developed into the interest and needs of children, really relevant with the characteristic of integrated Physical Education which emphasized that children who are not skillful in movement but have academic skill will find happiness and joy.

The characteristic on Integrative Thematic rapprochement which focused on the separation of invisible study subjects and presenting concept from several study subjects in one learning process is really relevant with Integrated Physical Education learning process characteristic which gives opportunity for teachers to integrated other study subjects into Physical Education.

**Table 4. Concept and Learning Characteristic of Integrated/interdisciplinary Physical Education and Thematic Integrative**

<b>Integrative Thematic</b>	<b>Integrated/interdisciplinary Physical Education</b>
Integrative Thematic rapprochement for grade 1-6 uses one book for all the courses so it can be harmonious with the ability of indonesian language as a device to communicate and the carrier of knowledge.	<ol style="list-style-type: none"> <li>1. Kinesthetic learning helps some children better grasp concepts in other subjects where they might otherwise struggle</li> <li>2. Physical education will have a newfound importance to other teachers in the school</li> </ol>
<ol style="list-style-type: none"> <li>1. Focusing on children</li> <li>2. Giving the real experiment</li> <li>3. The gap between courses is invisible</li> <li>4. Give the concept from some courses in one learning process</li> <li>5. flexible</li> <li>6. the result can be increased depends on the interest and need of the children</li> </ol>	<ol style="list-style-type: none"> <li>1. Teachers can integrate other subject matter into the physical education curriculum</li> <li>2. Some children who are not as proficient in movement but who excel academically will find the connection to be motivating and enjoyable</li> </ol>

## CONCLUSION

Based on the result of the research and discussion, it concluded that there are suitability between Integrative Thematic rapprochement learning process in 2013 curriculum in elementary school and Integrated Physical Education. This suitability observed from some aspects such as theory, concept, structure, and purview and also characteristic of learning process. The suitability is also came from the differences in the focus of the learning process. In the Integrative Thematic rapprochement of learning process, the focus is in the science, while in Integrated Physical Education the focus is in the physical education.

## REFERENCES

- Cone, T. P., Werner, P, and Woods. 2009. Interdisciplinary Elementary Physical Education-2nd Edition. Champaign, Illinois: Human Kinetics, Inc.
- Depdiknas. 2004. **“Model Pembelajaran Terpadu”**. Artikel. Direktorat Tenaga Kependidikan, Ditjen Dikdasmen, Depdiknas.
- Housner, L. D. (editor). 2009. Integrated Physical Education: Guide for the Elementary Classroom Teacher. Morgantown: West Virginia University.
- Kemdikbud.2012. Bahan Uji Publik Kurikulum 2013 pada tanggal 29 November 2013. Jakarta: Kemdikbud.
- Sutresna, N., dkk. 2003. “Model Pembelajaran Terpadu (Integrated Learning) Penjas di Sekolah Taman Kanak-Kanak”. Proposal Penelitian Tindakan Kelas. Bandung: Fakultas Pendidikan Olahraga dan Kesehatan Universitas Pendidikan Indonesia.
- Lutan, R. 1994. The Victorian Primary School System and Possible Application in the Indonesian Setting. Melbourne: Victoria.
- Siswoyo.2004. “Pembelajaran SD Cenderung Eksklusif”. Suara Merdeka, Kamis, 06 Mei 2004.
- Wiryan, S.A. 2003. “Pembelajaran Terpadu Hilang Gaungnya”. Pikiran Rakyat, 11 April 2003.
- Sugiyono. 2005. Memahami Penelitian Kualitatif. Bandung: ALFBETA.
- Saud, U. 1997. Pembelajaran Terpadu di Sekolah Dasar: Konsep Dasar dan Model-Model Implementasinya. Makalah. Universitas Pendidikan Indonesia Bandung.

# **THE EFFECT OF AEROBIC AND ANAEROBIC EXERCISES ON PREMENSTRUAL SYNDROME (PMS)**

(Experimental Study on Students FIK UNP)

**Umar**

**Padang State University, Indonesia**

**umarnawawi25@yahoo.com**

## **Abstract**

The main problem in this study is there are a lot of athletes (women athletes) who experience premenstrual syndrome, which is an uncomfortable feeling, both physically (physiological), and psychologically, so that it can affect their performance both at the time of exercise, or when following a game. This study aimed to examine the effect of aerobic exercise and anaerobic exercise on symptoms of the premenstrual syndrome disorder. This study is a quasi-experimental study with students of FIK UNP as the target population, and students from Coaching Education from 2010/2011 generation as a reachable population. Samples were taken by using purposive sampling from 20 people. Also from anaerobic exercise and aerobic exercise. Instrument that is used to collect data is by interviews and questionnaires. Analysis of the data using a t test with a significance level of 0.05. The results of the data analysis showed that: 1. Anaerobic exercise does not give an effect to decrease the symptoms of premenstrual syndrome (  $p 0.21 > \alpha 0.05$  ), 2. Aerobic exercise significantly influence to decrease the symptoms of premenstrual syndrome (  $p 0.005 < \alpha 0.05$  ), 3. There was no different effect between anaerobic and aerobic exercise in decreasing the symptoms of premenstrual syndrome (  $p 0.267 > \alpha 0.05$  ). It can be concluded that ; aerobic exercise is more effective compared to anaerobic exercise in decreasing the symptoms of premenstrual syndrome disorder.

## **INTRODUCTION**

Competition is so tight in sports achievement, causing stakeholders (trainers, coaches and athletes) make efforts to win the competition. These efforts begin with intense exercises, nutritional needs, using sophisticated infrastructure, involving science and technology in order to maximize the performance of athletes. However, even all the efforts have done in such a way, especially female athletes still have enough obstacles that affect performance during training and on the pitch. These constraints are an unpleasant nuisances both physiological (physical) as well as psychologically. Those nuisances are known as Premenstrual Syndrome (PMS).

Premenstrual Syndrome (PMS), is an unpleasant symptoms that are felt by a person 10-7 days before menstruation. PMS, which Affects Millions of women, has been recognized as a big nuisance.<sup>[16]</sup> This is because 40 million women in the world suffer from the symptoms of this syndrome, and more than 5 million of them are going to medical treatment for mental and behavioral changes caused by this syndrome.<sup>[4]</sup> these symptoms can be physical. Such as; abdominal bloating, breast swelling and tenderness, fatigue, pelvic pain, back pain and muscles, chills, nausea, vomiting, seizures, high fever, irregular heartbeat, uncontrolled movements and loss of

consciousness and headache. While the psychological symptoms include; irritability, emotional, irritable, prone to crying, difficulty concentrating, forgetfulness and depression, anxiety, stress, phobias, pessimistic, anxious, insecure, and sleep disorders. Researches from Iran have reported the prevalence of this syndrome as 62.4 % and 67.7 %.<sup>[19,11]</sup> Clinical and psychological symptoms of this common syndrome include depression, irritability, abdominal cramps, breast tenderness, headaches, isolation, and performance reduction.<sup>[17,24]</sup> Although the exact cause of this syndrome is almost unknown, the changes of ovarian steroid levels, vitamin and mineral deficiencies, disorders in the path of the renin - angiotensin - aldosterone, prostaglandins and prolactin increasing, age, and genetics have mentioned as risk factors.<sup>[17,20]</sup> Women with PMS compared with women with no history of PMS need care, higher medical treatment, and the possibility of absence from work.<sup>[10]</sup>

The syndrome brings forth familial consequences such as conflicts and controversies and discomfort among couples, which necessitate addressing and providing effective treatment strategies. Since the cause of this syndrome is unknown, the proposed treatments are different. At present, no cure for PMS is known.<sup>[10]</sup> In this way, the treatment includes medication (antidepressant tablets, vitamin B, etc.) And surgery (removal of ovaries ), and alternative non - pharmacological treatments (exercise, massage , therapy, etc.) have been proposed.<sup>[5]</sup> However, because the medical treatment has side effects, then this study provides physical exercise treatment (anaerobic and aerobic exercise) to overcome the symptoms of premenstrual syndrome. It is as said by Tailor, D. (2006) Considering the side effects of drug treatments and surgery, non-drug treatments, particularly physical activity, has Attracted the attention of professionals and women.<sup>[18]</sup> It seems that physical activity Affects the mechanisms of brain endorphins and improves mood symptoms. Physical activity by increasing endorphins and reducing the symptoms of adrenal cortisol leads to the improvement of PMS (Increased pain tolerance, anxiety, depression, etc.).<sup>[10]</sup> Considering that physical activity Compared with medical treatment is without side effects and has no risks, it is more suitable in this context and it was surveyed for the first time in 1993 by Johnson.

The relationship between physical activity and changes in menstrual periods and the reproductive system and the positive effect of physical activity were observed in some studies.<sup>[5,3]</sup> The results of most studies Showed that physical activity can improve PMS symptoms.<sup>[15,4,13,12]</sup> In 1998 in America, a survey was conducted during the which a change in diet and physical activity, as important treatments of PMS, were Introduced, and walking, swimming, and juggling were Considered as the best physical activities.<sup>[21]</sup>

This research provides two forms of physical exercise as treatment , to alleviate the symptoms of premenstrual syndrome . Hopefully the results of this study for the parties concerned , especially in female athletes improve performance in carrying out the exercise , as well as in following the game.

## **METHOD**

This research is a quasi-experiment, where aerobic exercise and anaerobic exercise as the independent variable (treatment), while the level of premenstrual syndrome as the dependent variable. The study design uses a two group pretest - posttest design. The target population is students FIK UNP, while the student population is reasonable force Coaching Education 2010/2011 . The sampling technique



was conducted with a purposive sampling as any as 20 people. After the initial test (pretest), the sample was divided into 2 groups, with each group consisting of 10 people sampel. There are also defined requirements as samples; regular menstrual cycles, premenstrual syndrome experience symptoms of 10-7 days before menstruation, PMS symptoms are felt both physically and psychologically, for a given treatment group aerobic exercise in the form of mixed-impact aerobics, whereas anaerobic exercise group was given treatment interval training. Treatment is done for 2 menstrual cycles, with details; 3 times per week for 6 weeks. The instrument used to obtain the data is limited to questionnaires and interviews. Data analysis using the t test with significance level  $\alpha$  of 0.05.

## RESULTS AND DISCUSSION

### 1. Result

- a. Based on data analysis, the results obtained  $0.21 p > 0.05 \alpha$ , thus it can be concluded that; there is no influence of anaerobic exercise to decrease the symptoms of premenstrual syndrome (PMS)

#### Paired Samples Test

	Paired Differences					t	df	Sig. (2- tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Data Awal Kel. 1 - Data Akhir Kel. 1	.2500	.4443	.0993	.0421	.4579	2.517	19	.021

- b. Based on data analysis, the results obtained  $0.005 p < \alpha 0.05$ , thus it can be concluded that; there is the effect of aerobic exercise on symptom reduction in premenstrual syndrome (PMS)

#### Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Data Awal Kel. 2 - Data Akhir Kel.2	.3500	.4894	.1094	.1210	.5790	3.199	19	.005

- c. Based on data analysis, the results obtained  $0.267 p > 0.05 \alpha$ , thus it can be concluded that; there is no difference in effect between anaerobic and aerobic exercise to decrease the symptoms of premenstrual syndrome (PMS)

### Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Data Akhir Kel. 1 - Data Akhir Kel.2	.1500	.5871	.1313	-.1248	.4248	1.14 3	19	.267

## 2. Discussion

Based on the analysis of data, it turns out that aerobic exercise can reduce the symptoms of premenstrual syndrome, while anaerobic exercise does not give a positive effect on the symptoms of premenstrual syndrome. Furthermore, the results of data analysis to see the effect of the difference between anaerobic and aerobic exercises to decrease the symptoms of premenstrual syndrome was not a significant difference. This is likely insufficient amount of exercise performed is only 6 weeks of treatment, so it has not showed significant differences.

As it is known that at the end of the luteal period, an increase in the activity of the renin-angiotensin hormone that can lead to decreased levels of the hormone estrogen progesterone, so it can ultimately lead to physical symptoms and edema. It is as it was concluded from the results of research Serena (2007), Johnson (2007) and Ugarizze (1998) that; Increased renin–angiotensin activity and decreased levels of estrogen and progesterone as factors in increased serum levels of aldosterone in the late luteal phase are listed,<sup>[15,8]</sup> and increased level of aldosterone in the serum increases the reabsorption of sodium and water, and as a result causes edema and physical symptoms.<sup>[21]</sup> By doing physical exercise, especially aerobic exercise, can decrease the activity of the renin-angiotensin hormone that. It is like the conclusion of research results Wilmore (2008), that; Researches show that the performance of physical activities reduces the levels of renin activity and increases the levels of estrogen and progesterone,<sup>[22]</sup> and in this way, decreases the serum levels of aldosterone and reabsorption of sodium and water, thereby reducing edema and improving physical symptoms. A survey conducted by Joyner and Charkoudian (2004) on 20 women showed that the 12-week aerobic exercise created the balance of estrogen and progesterone levels in women, reducing the symptoms.<sup>[9]</sup>

Aerobic exercise can increase levels of the hormone endorphin that gives comfort to the various parts of the body. It is as said by Aganoff (1994) believed that aerobic activity through an increase in brain endorphin and reduction of adrenal cortisol results in the improvement of PMS symptoms and psychological symptoms that may occur due to reduced beta-endorphins.<sup>[2]</sup> Further according Aganoff (1994) that; The positive effects of exercise on psychological symptoms are also justified by others. According to the cognitive–behavioral theory, intrusive thoughts and cognitive impairment lead to depression. Exercise results in the elimination of negative thoughts and brings about positive thoughts, and thus it can reduce depression for some time.<sup>[2]</sup> Also, stress and anxiety are produced due to lack of confidence in people; on the other hand, exercise causes collective social contacts and people increase their self-image and confidence, and as a result, stress and anxiety are reduced.<sup>[2]</sup>

Another factor in the emergence of physical symptoms is increased prostaglandin E<sub>2</sub>,<sup>[21]</sup> which reduces muscle contractions. The repetitive contraction in the aerobic exercise helps venous blood to return, resulting in the increase of prostaglandins and other substances which help prevent and reduce back pain and discomfort in the pelvis and the abdomen.<sup>[1]</sup> The effect of regular physical activity is the reduction of norepinephrine hormone levels at rest, which in turn can cause reduced heart rate and blood pressure at resting time.<sup>[7]</sup> In this study, the positive effects of aerobic exercise on psychological symptoms were observed. Meanwhile Scully (1998) Scully (1998) showed that 12 weeks of exercise (aerobic and non-aerobic) is effective in reducing PMS, but aerobic activity can reduce depression more.<sup>[14]</sup>

Based on the above, it can be concluded that; the results of this study showed aerobic exercise can reduce the symptoms of premenstrual syndrome, whereas anaerobic exercise does not have a significant influence on the symptoms of premenstrual syndrome.

### CONCLUSIONS

1. Anaerobic exercise does not have a significant influence on the reduction in the symptoms of premenstrual syndrome
2. Aerobic exercise a positive influence to the decline of symptoms of premenstrual syndrome
3. There was no significant difference between anaerobic and aerobic exercises to decrease the symptoms of premenstrual syndrome

### REFERENCES

1. Abbaspour Z, Rostami M, Najjar SH. (2006). The effect of exercise on primary dysmenorrhea. *J Res Health Sci.* ;6:26–31.
2. Aganoff JA, Boyle GJ. (1994). Aerobic exercise, mood states and menstrual cycle symptoms. *J Psychosom Res.* ;38:183–92. [PubMed]
3. Azhari S, Karimi A. (2005). The effect of an aerobic exercise program on the severity of premenstrual Syndrome. *J Women Midwifery Infertility Iran.* ;12:119–28.
4. Daley A. (2009). Exercise and premenstrual symptomatology: A comprehensive review. *J Womens Health (Larchmt)* ;18:895–9. [PubMed]
5. Dehghani MF, Emami M, Ghamkhar L. (2008). The effects of 3 months of regular aerobic exercise on premenstrual syndrome symptoms. *J Med Sci Rafsanjan.* ;7:89–98.
6. Edward Lichten M. Medical treatment of PMS. [Last accessed on 2005 Jun]. Available from: <http://www.usdoctor.com/2011/Jun PMS.htmArticle> .
7. German A, Kligler L. An integrative medicine approach to premenstrual syndrome. *Continuum center for health and healing, USA.* New York, NY 24. :86–93.
8. Johnson S. (2007). Premenstrual syndrome therapy. *Clin Obstet Gynecol.* ;41:405–21. [PubMed]
9. Joyner M, Charkoudian N. USA: Department of Physiology, Mayo Clinic Rochester; 2004. Physiologic considerations for exercise performance in woman.
10. Karimian N, Rezaeian M, Nassaji F.n (2006). The effects of physical activity on premenstrual syndrome. *J Med Sci Zanj.* ;13:8–15.
11. Kiani Asyabar A, Heidari M, Mohammadi Tabar SH. (2009). Prevalence, symptoms, signs and predisposing factors of premenstrual syndrome in women. *Daneshvar Medicine.* ;81:45–54.

12. Lustyk M, Weidman L, Perchance A. (2004). Stress, quality of life and physical activity in women with varying degrees of premenstrual symptomatology. *Women Health*. ;39:35–44. [PubMed]
13. Rapkin A. (2003). A review of treatment of premenstrual syndrome and premenstrual dysphoric disorder. *Psychoneuroendocrinology*. ;28(3):39–53. [PubMed]
14. Scully D, Kremer J, Meade MM, Graham R, Dudgeon K. (1998). Physical exerciser and psychological well-being: A critical review. *Br J Sports Med*. ;32:111–20. [PMC free article] [PubMed]
15. Serena S, Khaled M. (2007). Premenstrual syndrome. *J Obstet Gynecol Reprod Med*. ;18:226–35.
16. Shin KR, Ha JY, Park HJ, Heitkemper M. (2009). The effect of hand acupuncture therapy hand moxibustion therapy on premenstrual-syndrome among korean women. *West J Nurs Res*. 2009;31:171–86. Available from: <http://www.sagepub.com/>; <http://www.usdoctor.com/2011> . [PubMed]
17. Speroff L. (2001). *Clinical endocrinology and infertility*; 8th ed. USA: Publishers Williams and Wilkins; pp. 120–30.
18. Tailor D. (2006). Premenstrual syndrome research and the contribution of the society for menstrual cycle research. *J Sex Roles*. ;54:229–32.
19. Tatari F, Shakeri J, Hosseini M. (2007). Premenstrual dysphoric disorder, premenstrual syndrome and its related factors in girls high school students in kermanshah. *J Behav Sci*. ;5:89–95.
20. Translated by Niroomanesh. Tehran: Symya Publishers; 2008. Hekermor, *Principles of the disease of women and Obstetrics and Gynecology*; pp. 85–90.
21. Ugarrize DN, Klingners S, O'Brien S.( 1998). Premenstrual syndrome: Diagnosis and intervention. *Nurse Pract*. ;23:40–50. [PubMed]
22. Wilmore JH, Costill DL. (2008). Translated by Moeini. Tehran: Mobtakeran Publishers;. *Physiology of sport and exercise*; pp. 150–75.
24. Wilson R. (2001). Translated by Noori A. Tehran: Shahr-e-ab Publishers;. *Wilson's Obstetrics and Gynecology diseases*; pp. 83–96.

# LEARNING MODEL OF PHYSICAL EDUCATION USING MULTIPLE INTELEGENSCIES APPROACHES AND INFLUENCE ON CREATIVITY DEVELOPMENT

Roesdiyanto

State University of Malang, Indonesia

## Abstract

This study aims to develop a model of teaching physical education using multiple intelligences approach and its influence on the development of creativity. Using research methods development research and experimental comparison group design. The population is kindergarten in town, Blitar, Malang, Batu, Malang regency, consisting of 36 preschool, kindergarten as many as 12 samples taken in 3 cities, namely Malang, Blitar stones and as many as 240 people, a path analysis using ANOVA (one way ANOVA) , the F-test at significance level of  $\alpha = 0.05$  level. Results, the model of physical education with a model of multiple intelligences approach to the Intelligent post Games, and its influence on the creativity development with  $F_{hit.} = 50.917 > F = 3,871$ .

**Keyword:** physical education, development of creativity, multiple intelligences

## INTRODUCTION

Physical Education (PE) cannot be separated from the National Education System, and it is the integral part intergrated with the national Education System. The success of the Physical Education at schools will affect to the success of the National Education System. The physical education has an important role to form the qualified human being physically, mentally, socially and morally.

Successful in life, in the reality it is seen that a person with high IQ does not mean that he is successful and does not mean that he is happy. It shows that IQ is not a warranty for someone's success, although the IQ has an important role in someone's life, especially in the matter of knowledge development (cognitive). According to Gardner (2003) there are at least eight intelligence domains possessed by human being that can be developed since the early time i.e: (1) music, (2) body kynesthetic, (3) mathematics logic, (4) language, (5) (*spaces*), (6) interpersonal, (7) intrapersonal and (8) naturalistic. Entirely the eight intelligences are called *Multiple Intellengecies* (MI). Every one has these eight intelligences and every day he or she uses with the different combination and portion (Amstrong, 2003). The multiple intelligence theory of Gardner gives us the point of view of the complete student *potention*, therefore their multiple abilities that are neglected will be apreciated and developed as well.

Developing the multiple intelligence can be done since the early time, one of the ways is through the education institution for the early-age children. The Sisdiknas regulation no. 20 , 2003 verses 28 about the education for the early-age children states that PAUD is held through the formal education namely TK (kinder garten) and RA (Rudotul Atfal/Islam kindergarten), informal education i.e: Play Group and TPA (Al Qur an Education school) and held through informal education i.e: family education. This research will discuss about the physical education held in the level of the formal education namely Kinder garten or RA (Islam kindergatren).

Besides that, the early-age children are the important period in their ability development. In this case, just like what is stated by Erikson that the age of 3-5 years is the golden period that really determines the children to learn the sensitive period to absorb all information around them and less of the learning stimulation during this age is a disadvantage (Erikson in the *Ayahbunda* magazine, 2000). That opinion is strengthened by the research result done by some child psychologists. It is explained that the intellectual development of children happens maximally when they are at the early age, more or less 50% of the intelligence variabilities happen when they are at the age of four years old (Diknas, 2002). Those above statements show that at the early-age children, the intelligence is determined, therefore the stimulation given to the early-age children will determine the quality of the children in the future in their life.

Physical Education is given to the students for every level of education, starting from the basic level until the university ones. Based on the curriculum used at schools, the Physical education in kindergarten is called as the Physical development namely the subject /lesson given at the early age is to develop the basic ability through physical activities. Although they are different in words, theoretically, they have the same essence both between the physical education and the physical development i.e: both of them are the parts of the education process directed to develop and increase the ability of the human being entirely (physically, mentally, intellectually, emotionally and spiritually) through the media of the physical activities.

The physical education in PAUD (the early-age education) has a potentia to develop the intelligence domain of children because the physical education is an education done through the physical activities, by using various activities in the forms of sport activities. Edward (1973) explained that the definition of sport begins from the wide definition including *play* (bermain), *games* (permainan) and sport (olah raga). The teaching characteristic in the early age is 'playing while learning' or 'learning while playing' (Diknas, 2004), therefore it is really right if the physical education is used as media to develop intelligence of the early-age children.

## METHOD

This study aims to develop a model of teaching physical education using multiple intelligences approach and its influence on the development of society and the environment. Using research methods (1) research and development (2) experimental studies using the static group comparison design. The population is kindergarten in town, Blitar, Malang, Batu, Malang regency, consisting of 36 preschool, kindergarten as many as 12 samples taken in 3 cities, namely Malang, Blitar stones and as many as 240 people, a path analysis using ANOVA (one way ANOVA), the F-test at significance level of  $\alpha = 0.05$  level. Results, the model of physical education with a model of multiple intelligences approach to the Intelligent post Games, and its influence on social development and the environment with  $F_{hit} = 50.917 > F = 3,871$ .

## RESULT

### **The Influence of The Learning Model Based on The Multiple Intelligence towards The Learning Result of Creativity Development**

The influence between the learning model by using the multiple intelligence approach and the learning model existed at school towards the learning result for the area of the early-age child creativity development is analysed by using the ANOVA analyses, from the test we found data as follows:

Tabel 1. The approach influence of the multiple intelligence learning method towards the learning result of the creativity development

**ANOVA**

Tes					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	66.535	1	66.535	50.917	.000
Within Groups	410.310	314	1.307		
Total	476.845	315			

The result of test F with significance  $\alpha = 0.000$  is 50.917. Table F (0.05,1,134) = 3.871. Since count or 50.917 > 3.871, the working hyphotese is accepted (H1 is accepted) and the zero hyphoteses is rejected (Ho is rejected), therefore we can say that there is influence between the learning model by using the multiple intelligence with the learning model existed at school towards the learning result in the area of the students' creativity development.

## DISCUSSION

The application of the learning model used by teachers for learning of the early-age children at school basically is not too different from the learning models by using the multiple intelligence. It is just like something explained by Tienjte and Iskandar (2004) which stated that the learning for the early-age children has five essential charateristic of playing in relation with the children's development , namely: a. playing is doing an activity because there is motivation from the children, this activity is done in order that we can entertain ourselves, b. playing is the free choices of the children, they can choose to play or not to play, c. playing must be fun, children must feel fun in getting the experience to do the activity, d. playing is a non-linear activity, this activity involves an element which is from one step to the next step, e. in playing, children are involved actively, this activity involves the children physically and psychologically.

Hawadi (2001) said the same thing, he explained that the learning for children aged 4-7 years old (early ages) emphasizes on the game forms that have functions to make the children have oportunities to explore, find something, express feeling, have creativity and learn with fun ways. To fulfill those needs, teachers as one of the learning sources need guiding about the various sport games in order to develop the early-age children's capability holistically through the games activities.

It also happens to the approach by using the multiple intelligence on the physical and health learning, it is not different from what we mean of the two opinions above, basically the multiple intelligence approach wants to explore more details about each component of those learning purposes, namely interpersonal intelligence, music, laguages, mathematics logic, spacial, naturatistic, intra personal and kinesthetic. In details those purposes are, a. developing the competence of the rough motoric coordination, b. putting in the sportivity and dicipline values, c. developing the physical fitness, d. introducing the healthy life early, e. introducing beautiful movement through the music rhythm (Diknas, 2004).

However, if we see from the component factors that are going to be developed seriously, we can see that there are differences between the model of learning approach done by the teachers at school and the learning model with the multiple intelligence,

especially on the development factors : a. the area of language competence, b. the sense of the social and environmental health, c. creativity, d. the development of the physic and health, in which the learning model with the multiple intelligence approach is better if we compare it with the model of learning approach done by the teachers at schools.

It is caused that in the model approach of multiple intelligence on each exercise model is emphasized very much on developing those factors(elements). On the interpersonal intelligence we put the evaluation in the factor (element) of social and environment health development to be applied in each game models, with the improved indicator namely : cooperation between two (2) people forms a bridge (traffic games). They are the cooperation to finish pictures and the children's ability to give support to their friends who are playing the games (cheerful relay games and smart circuit). It is suitable with the Gardner theory (2003) which explains that the intelligence or competence to communicate with other people (socializing). According to Soenaryo (2004) the way of learning to optimize the interpersonal intelligence is one of them as mediator/developing the ability to work together(to cooperate). The similar condition is also explained by Amstrong (2003) that the best way of learning for talented children in this category has the relationship and the cooperation.

In the development of music competence, there is only one game that applies this intelligence ; however, there is still possibility that all games can put this intelligence, the indicator of this music competence used in the games are : the children's competence to sing songs with the traffic theme while clapping their hands (traffic games). It is suitable with the Gardner theory (2003) which explains that the music competence is a competence that is based on the awareness on the pitch of the tone, including various surrounding sounds and the sensitivity towards the music rhythm. Children with the musical competence learn through the rhythm and the melody, therefore in their learning process we can use the percussion as the music instrument as a way to help them learn new materials (Amstrong,2003). Therefore, the children's ability to know the music instrument and to know how to play it can be used as one of the indicators from the music competence.

Meanwhile in the spatial competence that is included in the creativity development, it is applied in almost all games, the indicators that are developed are: a. using the pictures with the traffic themes (traffic games), b. drawing an object by connecting the dots provided in the pictures and knowing the movement directions (straight or turn/curves) (the cheerful relay games), c. using the bottles filled with the red and blue-colored water, the plantation and animal pictures and playing with the circuit concepts (smart circuit games). These activities are suitable with Gardner opinion 2003) which explains that the intelligence that is realized in the competence by using the sense of sight and the ability to visualize an object, includes a competence to create mental-imagination/drawing (painting). This opinion is supported by Amstrong (2003) which explains that to stimulate this intelligence, children need to be taught through drawing, metaphor, visual and colors. The opinion is strengthen by Suparno (2004) which explains if we want to stimulate this intelligence, we can do it by giving activities that support the elements of colors, shapes, designs, textures, patterns, pictures or visual symbols that can be seen.

Interpersonal Intelligence. This intelligence is used in almost all games; there are some difficulties to apply the intelligence indicators in the games. However, in this module we try to apply this intelligence in the forms of games, the intelligence indicators that are developed are: a. feeling the touch of their friends' bodies and motivating themselves to obey every game's rule and introducing human's identity as



well based on the genders (traffic games), b. motivating themselves to hand in the flags to their friend in their group (cheerful relay games), c. motivating themselves to finish the game in every post (smart relay games). The activities in those games are suitable with the Gardner opinion (2003) namely the intelligence related to “the inside aspect” of someone (egoism): self reflection, metacognition, and the awareness of the spiritual reality. Suparno (2004) explained that as educators, teachers can help the children to increase intrapersonal intelligence in some training like managing emotion, training concentration, and empathy, knowing themselves. This opinion is supported by Amstrong (2003) which explained that children having this intelligence motivate themselves to do an activity.

For the kinesthetic intelligence, we put the learning evaluation of the early-age children is included in the development of the physical and health elements/factors. In the learning process, physical education is one of many subjects at schools that tries to optimize the children’s kinesthetic intelligence, with the kinesthetic intelligence indicator developed are: a. children’s competence do movement activities like to stand up, run, walk, bend to form a bridge, crawl, march (traffic games), b. hopping, stepping, jumping, running and walking on the footbridge block (cheerful relay games), c. walking on the footbridge, zig zag running, tiptoeing and crawling (smart circuit games). Gardner (2003) explained that the intelligence is related to the physical movements (the movement of the body or the part of body); including the motor brain nerves that controls the movement of the body and the part of the body. In the application Amstrong (2003) suggested to give children an access to play in the field, hurdle field (a field that is already designed), swimming pool and sport room. Besides that this game is aimed to train the gross motor movement of the children. It is suitable with the opinion of Sugiyanto and Sudjarwo which explained that gross motor skill is a movement in which its application involves the big muscles as the main base of movement (running, walking, throwing, etc). The models of the games developed have already adapted with the early-age children’s basic movement needs which are divided into three kinds of movement namely locomotor movement (walking, running, hopping, and jumping), non locomotors (*stretching, push-up, sit-up* and flickering the body to the frontward) and manipulative (catching, throwing and hitting) (Corbin 1980).

## CLOSING

Based on the research purposes, we can conclude as follows: **First**, there are two models that can be developed by using multiple intelligences approach, which models the Intelligent post Games, **Second** There are differences in the physical education learning outcomes in creativity development among students who use the learning model of physical education based multiple intelligences (Multiple Intellegencies), by using a learning model used by teachers in schools. The use of the model-based physical education learning multiple intelligences (Multiple Intellegencies) is better than the learning model used by teachers in.

## BIBLIOGRAPHY

Amstrong, Thomas. 2003. *Setiap Anak Cerdas, panduan membantu anak belajar dengan memanfaatkan multiple intelligencenya*. Jakarta: PT. Gramedia Pustaka Utama.

- Annarino, A.A, Cowell, C.C, Hazelton, H.W. 1980. *Curriculum Theory and Design in Physical Education*. St. Louis: The CV. Mosby Company.
- Ayahbunda. 2000. *Anak Prasekolah*. Jakarta: PT Gaya Favorit Press.
- Borg, W.R. & Gall, M.D. 1983. *Educational Research: An Introduction*. 4<sup>th</sup> ed. London: Longman Inc.
- Corbin, Charles B. 1980. *A Textbook of Motor Development*. 2<sup>nd</sup> ed. Iowa: Wm. C. Brown Company Publisher.
- Dayati, Umi. 2004. *Strategi Mendidik Anak Sejak Dini Usia Guna Memperkokoh Kepribadian Bangsa*. Makalah disampaikan dalam Pembekalan Pendidikan Anak Dini Usia (PADU), Malang, tgl 26-27 Juli 2004.
- Dick, W and Carey, L. 1990. *The Systematic Design of Instructional (second edition)*. London: Scott Foresman and Company.
- Diknas, 2004. *Kurikulum 2004, Standar Kompetensi Taman Kanak-kanak dan Raudatul Athfal*. Jakarta: Depdiknas.
- Diknas a, 2003. *Metodik Khusus Pengembangan Jasmani di Taman Kanak-kanak*. Jakarta: Depdiknas.
- Diknas b, 2003. *Program Kegiatan Belajar Taman Kanak-kanak*. Jakarta: Depdiknas.
- Drowatzky J.V. at al, 1984, *Physical Education Career Perspectives and Professional Foundations*, New Jersey: Englewood Cliffs, Prentice-Hall Inc.
- Freeman, W.H. 1987. *Physical Education and Sport in Changing Society*. New York: Macmillan Publishing Company.
- Gabbard C, LeBlanc E and Lowy S, 1987, *Physical Education for Children*. New Jersey: Englewood Cliff, Prentice-Hall Inc.
- Gardner, H. 2003. *Multiple Intelligences*. Terjemahan Alexander Sindoro. Jakarta: Interaksara.
- Gunawan, Adi, W. 2003. *Born to be Genius*. Jakarta: PT Gramedia Pustaka Tama
- Hawadi. 2001. *Psikologi Perkembangan Anak*. Jakarta: PT Grasindo.
- Hurlock, EB. 1979. *Psikologi Perkembangan*. Terjemahan Iswidayanti. Jakarta: PT Gramedia.

- Lazaier, David. *What Is Multiple Intelligences?*, online ([http:// www. multi-intell com](http://www.multi-intell.com). Diakses 28 Februari 2005).
- Lumpkin, Angela. 1998. *Introduction to Physical Education, Exercise Science and Sport Studies*. New York: Mc-Graw Hill.
- Meliala, Andyda. 9 Juli 2004. *Kecerdasan Majemuk, Kecerdasan Seutuhnya: Mendidik Anak Cerdas dan Berbakat*, online ([http:// www. Balita Cerdas. com](http://www.BalitaCerdas.com). Diakses 31 Desember 2004).
- Mosston, M. dan Ashworth, S. 1994. *Teaching Physical Education*. 4th. Ed. Macmillan: College Publishing Company.
- Santoso, Barokah. 2002. Multiple Intellegencies (Kecerdasan Majemuk) dan Accelerated Learning (Pembelajaran Dipercepat). *Gentengkali*. Vol 4 No. 1 dan 2, hal 46-48.
- Semiawan, Conny,R. 2002. *Belajar dan Pembelajaran dalam Taraf Pendidikan Usia Dini*. Jakarta: PT Gramedia Pustaka Tama
- Soenaryo, Fatimah, S. 2004. *Mengoptimalkan Perkembangan Kecerdasan Anak Sejak Dini Usia (Kajian Teoritis tentang Multiple Intellegences-Howard Gardner)*. Makalah disampaikan dalam Pembekalan Pendidikan Anak Dini Usia (PADU), tgl 26-27 Juli 2004.
- Sugiyanto dan Sudjarwo. 1991. *Perkembangan dan Belajar Gerak*. Jakarta: Depdiknas.
- Suparno, Paul. 2002. *Teori Intelegensi Ganda Dan Aplikasinya Di Sekolah*. Yogyakarta: Penerbit Kanisius.
- Syariffudin. 2003. The Identify Crisis of Physical Education. Makalah disajikan dalam International Conference on sport sciences and Physical Education professions, Universitas Pendidikan Indonesia, Bandung, 10-12 Maret.
- Syariffudin dan Sukur, A. 2002. Program Pembelajaran Gerak Siswa Pra-sekolah. *Fortius*. Vol. 2 No 1 hal 39-46.
- Tientje, Nurlaila dan Iskandar, Y. 2004. *Pendidikan Anak Dini Usia Untuk Mengembangkan Multipel Inteligensi*. Jakarta: Dharma Graha Press.
- Undang-undang RI No. 20 tahun 2003 tentang Sistem Pendidikan Nasional. 2003. Jakarta: PT Armas Duta Jaya.
- Wuest, Deborah A. dan Bucher, Charles A. 1995. *Foundations of Physical Education and Sport (twelve edition)*. St. Louis: Mosby-Year Book, INC

# NEUTROPHILS PERCENTAGE AFTER CONSUMING RED GUAVA JUICE (*Psidium guajava* L. Red Cultivar) DURING AEROBIC EXERCISE

Yuliana Noor Setiawati Ulvie<sup>1</sup> and Sugiarto<sup>2</sup>

<sup>1</sup>Nutrition Study Program, University of Muhammadiyah Semarang

<sup>2</sup>Faculty of Sport Science, Semarang State University

<sup>1</sup>[ulvieanna@gmail.com](mailto:ulvieanna@gmail.com) <sup>2</sup>[sugiarto.ikor@gmail.com](mailto:sugiarto.ikor@gmail.com)

## Abstract

Aerobic exercise causes overly muscle contraction and the use of occasionally used muscle, so that additional unit motor recruitment is needed. Therefore causes metabolism inside the body is increases. If the requirement of antioxidant inside the body is not enough, it will cause oxidative stress, which then result inflammation. Antioxidant is needed to prevent the occurrence of oxidative stress. The purpose of this research is to study the difference neutrophils percentage between a group who consumes red guava juice and plain water group during aerobic exercise. The design research is experimental-nonrandomized pre-post test control group. The subjects of the research are 16 students of STPN Yogyakarta who are divided into 2 groups who are the red guava juice and plain water groups. Both groups perform aerobic exercise during 30 minute run every other day for 27 days. Blood samples are taken for measuring neutrophils percentage. T-test and Repeated Anova test are used for data analysis. T-test analysis of neutrophils percentage shows that there is difference between red guava juice group and plain water group. The percentage of neutrophils declines and statistically, there is a significant difference between the group which consumes red guava juice and plain water group.

**Keywords:** aerobic exercise, red guava juice, neutrophils percentage

## INTRODUCTION

Physical exercise is a form the physical activity which can increase physical fitness<sup>1,2</sup>. Physical exercise is not only advantageous, but also risky<sup>3</sup>. Tissue damage may occur because of either maximum or submaximum physical exercise<sup>4</sup>. Light until moderate intensity of aerobic exercise will boost physical health and fitness. Moderate intensity of physical exercise generates cardiovascular capacity and minimizes injury. On the other hand, hard aerobic exercise can cause injury and harm body immunity.

A 30-60 minute physical exercise is more effective compared to a 10-15 minute physical exercise. The suggested duration of minimal physical exercise is 20 minutes, and it will be more effective if it is done for 30-60 minutes. It is suggested to do physical exercise from 3 to 5 times a week. The duration of the exercise program can be for 3-4 weeks. However, most of researchers suggest that physical exercise program is done for 5-10 weeks<sup>5</sup>.

Physical exercise can cause positive effects are the body can get healthier and fitter. The effects of cell level aerobic physical exercise are increase of the number of lipid oxidation, enzyme muscle glycogen, mitochondria, and mioglobin. Anaerobic

exercise, which is increases fosfagen, ATP-PC, and glycolisis enzyme. The negative impact of physical exercise is damage or muscle injury. Overly done physical exercise, who is not according to the capacity, and to untrained people may cause muscle pain, the joint is painful to move. This symptom is called delayed onset muscle soreness (DOMS). The muscle damage on physical exercise is caused by mechanical trauma when muscle, followed by oxidative stress, is contracted<sup>6</sup>.

Aerobic training may cause over muscle contraction, the use of unused muscle, so it needs additional unit motor recruitment. Bone muscle contraction is mechanical, chemical, and electrical incident, consisted of six stages called cross bridge cycle. For untrained people, power stroke, sliding filament, and disconnecting in cross bridge cycle are mechanical trauma, which may cause muscle injury<sup>7</sup>.

The area suffering muscle injury will extract chemo attractant which attract neutrophils into the muscle injury area, followed by the formation of reactive oxygen species (ROS) used as body protection. In a normal situation, the formation of ROS will be balanced by the formation of endogen antioxidant such as superoxydes dismutase (SOD), glutathione peroxides (GPx), and catalase. Oxidative stress will occur when the formation of antioxidant is smaller than that of free radical<sup>8,9</sup>.

Body has protection systems which are endogenous antioxidant components in the form of enzymes like superoxide dismutase (SOD), glutathione peroxidase (GPx) and catalase which can remove free radicals enzymatically to fight free radicals. Body also has exogenous antioxidants which amount depends on diet consumption. Although body can naturally overcome the increase of free radicals, but in a hard condition such as maximum physical exercise, endogenous antioxidants are not sufficient, so that body needs exogenous antioxidants. Inspite of it, some research shows that moderate and regular physical exercise can improve endogenous antioxidants defense system and protect the body from free radicals which are produced by the body during its physical exercise<sup>10</sup>.

Aerobic exercise is physical exercise which is done with oxygen, it is the ability of the body to use sufficient oxygen to fulfill the body's need in doing physical exercise. Excessive physical exercise can damage erythrocyte cell membrane. The evidence of the damage because of oxidation during physical exercise depends on parts of body trained and levels of practice. Hard physical exercise for untrained person enables the damage due to oxidative stress. Hard physical exercise produces extra free radicals, so that the body needs antioxidants<sup>11</sup>.

Body has antioxidant defense mechanism to prevent oxidative stress. Antioxidants which belong to enzymatic antioxidants are SOD, glutathione peroxidase, and catalase, while the non-enzymatic ones are vitamin E ( $\alpha$ -tocopherol), vitamin C (ascorbic),  $\beta$ -carotene, glutathione, flavonoids, uric acid, and ceruloplasmin. Aerobic exercise can cause oxidative stress on many kinds of antioxidants like reduced Glutathione (GSH), catalase, Superoxide Dismutase (SOD), Glutathione Peroxidase (GPx), and vitamin C. This can lower antioxidants activity and its recovery may take varied length of time. Plasma vitamin C increases during physical exercise, but it can decrease for 48 hours after the exercise<sup>12</sup>.

Guava (*P. guajava* L) is a natural supplement, in the form of fruit, as an antioxidant source. Guava (*P. guajava* L) is a fruit which is generally consumed in Indonesia and it found and known by people. Guava (*P. guajava* L) is a fruit which contains vitamin C particles, potassium, B-carotene, Fe, Se, Cu, Zn, lycopene, lutein, xanthine, cryptoxanthine, zeaxanthine, anthozyanidin, quercetin, lignin, and anti

inflammation<sup>13</sup>. Guava contains lycopene, a carotenoids substance having antioxidant activity which is useful to give free radical protection for the body. Guava which has much lycopene is mainly from red-meat guava<sup>14</sup>. Besides that, guava contains flavonoids which has an ability as anti inflammation<sup>15</sup>.

The purpose of this research is to study the difference percentage of neutrophils between the group who consumes red guava juice and the group who consume plain water during aerobic training.

## RESEARCH METHOD

This design research is experimental, nonrandomized pre-post test control group. The subjects of the research are 2 groups of 8 people who are healthy volunteers followings are the inclusion and the exclusion criteria. Each group research subject is 8 people with inclusive criteria, university student living in STPN Yogyakarta dormitory, men aged 17-25 years old, healthy, normal nutrition status, willing to be research subject, consume dormitory's meal, never suffered from chronic disease, not smoke, never followed the aerobic exercise program minimally in the last 6 years and non athletes. Exclusive criteria are consuming antioxidant vitamin and not willing to be research subject.

The research material is red guava (*P. Guajava L. Cultivar Red*) which is almost ripe with yellowish peel. The subjects are given red guava juice made from 800 grams of red guava and 1200 mLs of plain water, so that every subject consumes 240 mLs red guava juice. Both groups perform aerobic exercise during 30 minute run every other day for 27 days. Blood samples are taken for measuring neutrophils percentage

The result of the research is analyzed by using SPSS program for Windows. The difference neutrophils percentage of the two groups are analyzed by using t-test ( $p < 0,05$ ). The disparity in measurement of each group is analyzed by using Repeated Anova test.

## RESEARCH RESULTS AND DISCUSSION

The subject of this research are student of Sekolah Tinggi Pertanian Nasional (STPN) Yogyakarta who live in a dormitory. The subjects are men, divided into 2 groups, Red guava juice group and plain water group. Those are consumed every day at 5 a.m for 27 days, both groups get aerobic exercise treatment, which is running every other day. Before doing data analysis, Shapiro-wilk test normality test is done. Subject characteristics of both groups do not show any significant difference.

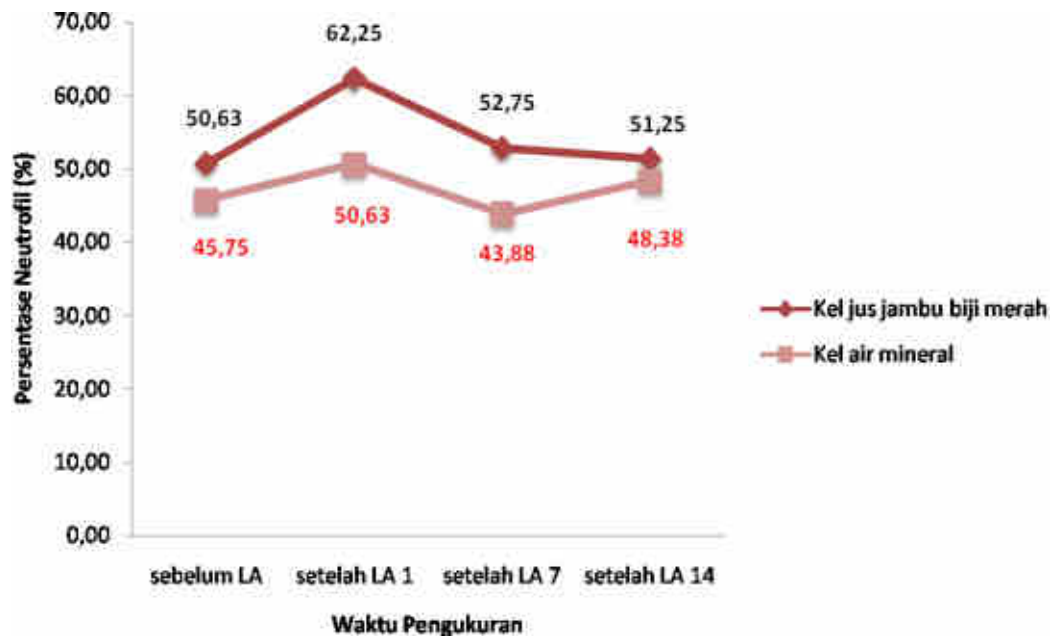
Table 1. Result of Neutrophils Percentage Analysis (%)

Result	Group		p value*	p value**	
	G- 1	G-2		G-1	G-2
Before the 1 <sup>st</sup> AE	50,62±5,12	45,75±4,03	0,053	0,004	0,160
After the 1 <sup>st</sup> AE	62,25±10,0	50,62±8,24	0,024		
After the 7 <sup>th</sup> AE	52,75±5,15	43,87±6,40	0,009		
After the 14 <sup>th</sup> AE	51,25±4,30	48,37±8,60	0,412		

Note: \* t-test analysis result \*\*Repeated Anova analysis result

The result of neutrophils percentage t-test before aerobic exercise and after the 14<sup>th</sup> aerobic exercise shows that there is no significant neutrophils percentage difference between red guava group and mineral water group ( $p > 0,05$ ). The result of neutrophils

percentage of repeated anova analysis in the red guava group can be concluded that there is significant difference of treatment in the red guava group ( $p>0,05$ ), in the mineral water group shows that there is no significant, who means that there is not difference in the mineral water group.



Muscle contraction on aerobic exercise is electrical, chemical, and mechanical incident. Contraction on each muscle has different power. The amount of contracting fiber in a muscle depends on the number of motor unit recruitments. The more powerful the contraction is, the more recruited or stimulated motor unit is for contraction. The power of contraction occurring on each motor unit depends on the size of motor unit<sup>16</sup>.

For people who have never had an exercise, physical training causes the emergence of oxidative stress sign in the blood and muscle tissue. The needs of oxygen is increasing in the body during exercise will tend to increase the production of free radicals<sup>17</sup>. Cells can tolerate the condition of oxidative stress in mild degree because it has defense system. This system can recognize and replace damaged molecule with the new one. It can increase antioxidant as a response towards stress. In the bigger oxidative stress level, body is no longer able to keep the balance between oxidative stress and antioxidant defense system, so that metabolism disturbance, in the form of calcium metabolism disturbance, DNA damage, cell membrane damage, and protein damage, occurs<sup>18</sup>.

The increase of free radicals and tissue damages on the exercise is caused by the increase of the needs of energy during exercise, while the supply energy in the inter-cellular is very limited, so energy formation process keeps going through oxidation process, Krebs cycle, and electron transport. That process needs oxygen, so that the needs of oxygen increases very dramatically<sup>19</sup>.

Oxidative stress is the increase of free radicals production which can cause tissue damage. The source which has potential to increase free radicals production inside the body, who one of the examples is neutrophils leucocytes activation, known as reactive oxygen species (ROS). ROS component forms body's defense mechanism towards foreign materials during infection or inflammation and tissue damage caused by

injury. Aerobic exercise can increase neutrophils leucocytes activity to produce ROS as a response for tissue damaged caused by oxidative stress during exercise<sup>20</sup>.

Aerobic exercise may cause damage in the muscle, which can cause inflammation. Inflammation is a physiological response some stimulations such as infection and tissue injury. Accute inflammation response involves systematical and local effect. Local effect begins if endotel tissue damage inducted the formation of plasma enzyme mediator, which causes vasodilatation and the increase of membrane permeability<sup>21</sup>.

Neutrophils cells have chemotaxis (cell migration), phagocytes cell will be attracted to the bacteria or to the inflammation area, because there is chemotoxic substance freed by the damaged tissue. Neutrophils also has an ability to do phagocytosis, swallowing and eating foreign cells or materials. Both cytoplasm to each other and foreign materials are locked in a room in the neutrophils cell<sup>22</sup>. After finishing its function, granulocytes dies. Neutrophils is the kind of white blood cell which is the first to come to the inflammation area<sup>23</sup>.

Neutrophils is the increase of the amount of neutrophils in the above normal blood. In several hours after the accute inflammation starts, the amount of neutophils in the blood sometimes increases to 4-5 times. This is the effect of chemical substance combination which is released from the inflammed tissue, called leucocytosis inductive factor. This factor difuses in the inflammed tissue in the blood and is directly brought to the bone marrow, which causes the release of much leucocytes, especially neutrophils. Through this way, much neutrophils is almost immediately moved from bone marrow to the circulated blood. The inflammed tissue and product also cause neutrophils to move from circulation to the inflammed area, in several hours after tissue damage happens, the injured area is filled with neutrophils<sup>24</sup>.

Inflammation is shown by local blood vessel vasodilatation which causes blood circulation, increases capillary permeability, causes a large amount of fluid leakage inside interstitial, fluid freezing occurs inside inside interstitial, caused by a large amount of leakage of fibrinogen and other proteins from capillary, migration of a large amount of granulocytes and monocytes inside the tissue, and inflammation of tissue cells<sup>25</sup>.

Aerobic exercise can cause oxidative stress, so it can decline antioxidant activity. If this happens, superoxydes and hydrogen peroxydes will be hoarded, so chain reaction is formed, a reaction which can cause injury and tissue inflammation<sup>10</sup>. When they occur, leucocytes, particularly neutrophils, is the first to come to the area of injury or inflammation. Leucocytes will be rapidly migrated and gathered in the injured tissue. This is the effect of chemical compound released from inflammed tissue, which is the factor of leucocytosis inductor. This factor is diffused from the inflammed tissue in the blood and carried to bone marrow which causes the release of leucocytes, particularly neutrophils<sup>25</sup>.

The percentage of neutrophils in the circulation can increase immediately. It happens after cycling for 45 minutes with VO<sub>2</sub> intensity of max 50% for untrained people<sup>26</sup>. Neutrophils increases after cycling using ergocycle for 30 minutes for untrained people<sup>27</sup>. The inflammation destroys capillary wall, so it makes neutrophils stick and then increases capilar permeability, so that it can go inside the tissue (diapedesis). This causes neutrophils to move to the injured tissue (chemotaxis). Neutrophils involved in inflammation process and cell recovery can be a potential source of f ree radicals production<sup>28</sup>.



Neutrophils percentage after the first aerobic exercise and after the 7<sup>th</sup> aerobic exercise on both groups has significant difference. The consuming of red guava juice can hamper the increase of neutrophils during aerobic exercise for the beginner. In a normal situation, free radicals is formed slowly, and then is neutralized by antioxidant inside the body. For the beginner, if the speed of free radicals formation is very high because of the exercise, the amount of free radicals will exceed the ability of body defense system, which causes bone and muscle cells damage. Therefore, by consuming red guava juice, the unbalance between free radicals and antioxidant can be minimized, because vitamin C plays important role as antioxidant which is able to slow down peroxy radicals.

Body owns defense system towards free radicals, antioxidant components. Antioxidant can be categorized as non enzyme and enzyme antioxidant, and chain breaker and deterrent antioxidant. The examples of enzyme antioxidant are SOD, glutathione peroxidase and catalase, while the examples of non enzyme antioxidant are vitamin E, glutathione, and vitamin C<sup>29</sup>.

Guava contains vitamin C, potassium,  $\beta$ -carotene, vitamin E, Fe, Se, Cu, Zn, lycopene, lutein, xanthine, cryptoxanthine, zeaxanthine, ellagic acid, anthocyanidin, guercetin, and lignin compound<sup>13</sup>. Besides that, guava also contains high phytochemical compound, such as carotenoids, polyphenols, and flavonoids. This flavonoid compound has an ability as anti inflammation, anti allergy, anti virus, and anti cancer<sup>15</sup>. Guava also contains lycopene, a carotenoids substance having antioxidant activity which is useful to give protection for the body from free radicals. Guava mostly contains lycopene, especially the red-meat guava<sup>14</sup>.

Nutrient content in the red guava juice is vitamin C, lycopene, flavonoids, and other important nutrients. Red guava contains lycopene, included as lipophilic antioxidant, which is able to slow down lipid peroxy radicals and catch single oxygen which then is neutralized, so that chain reaction stops and causes less lipid peroxidation formation. Lycopene is able to stimulate the work of antioxidant enzyme, such as SOD, GPx, and catalase. SOD enzyme is functioned to prevent the hoarding of superoxides, catalase enzyme, and GPx prevent the hoarding of H<sub>2</sub>O<sub>2</sub> by the way to release H<sub>2</sub>O<sub>2</sub> to be H<sub>2</sub>O or H<sub>2</sub>O + O<sub>2</sub>. The decrease of H<sub>2</sub>O<sub>2</sub> means that hydroxyl radicals formation can be prevented, so that lipid peroxidation will decrease, and inflammation or tissue damage can be deterred. Besides that, the high flavonoids content in red guava juice has an ability as anti-inflammation<sup>15</sup>.

Significant increase of neutrophils percentage happens in plain water group before exercise, after the first aerobic exercise, then, significant decline occurs after the first aerobic exercise and after the 7<sup>th</sup> aerobic exercise. This happens because the percentage of research subject food intake is in the good category, according to suggested sufficient level, although there are some nutrient substances which exceed 100%, such as mangan, which can cause body poisoning if it happens for a long time.

Intensity of aerobic exercise used in this research is light, which consideration that the subject of the research are beginners, and mild intensity exercise is useful to increase cardiovascular capacity as well as to minimize injury, but enough to find out oxidative stress caused by the exercise. Mild intensity exercise can increase production of free radicals exceeding antioxidant defense capacity, so that oxidative stress occurs<sup>30</sup>.

Aerobic exercise, done regularly in the long term, has positive effect on over oxidative stress. This happens because aerobic exercise causes mild oxidative stress, by that the formed free radicals can be responded by modulating cellular response, which

triggers antioxidant enzyme gene expression, so that antioxidant enzyme up regulation happens<sup>31</sup>.

Response of antioxidant defense system towards aerobics exercise depends on many factors. These factors are, exercise duration, exercise intensity, previous exercise exposure, and age. Result variability is caused by the difference of the used exercise model, the time of sample taking, the status of subjects' exercise, and environment-like height factor<sup>32</sup>.

Individual status, trained or untrained, has a role in the formation of free radicals. The untrained individual has undergone adaptation process where antioxidant enzyme increase and oxidative ability occurs, so that the use of oxygen for energy need is more efficient<sup>28</sup>. For trained and untrained men and women who do running exercise, the result shows an increase on mitochondria oxidative ability and antioxidant enzyme on the trained people<sup>33</sup>.

In this research, red guava juice is given. It is one of vitamin C sources, because vitamin C is known as one of main antioxidants. Effect on consuming vitamin C for active people who do many exercises are widely researched. The result of research about vitamin C effect towards oxidative stress because of exercise is still varied. The consuming of vitamin C decreases oxidative stress because of exercise<sup>34</sup>.

## **CONCLUSION AND SUGGESTION**

It can be concluded from the research result there is difference occurs in the neutrophils percentage between a group consuming red guava juice and a group consuming plain water. It is better to have a research using more than one antioxidant enzyme parameters and measuring occurred free radicals during aerobic exercise to gain clear about body antioxidant defense system.

## **ACKNOWLEDGMENT**

The writer thanks all people who have helped the writer do this research – Prof. Dr. Wiryatun Lestariana, Apt., dr. Zaenal Muttaqien Sofro, AIFM., Sport&Circ. Med., dr. Denny Agustiningih, M.Kes., AIFM. as an advisor, and Prof. Dr. Endriatmo Soetarto, M.A. as the head of STPN Yogyakarta. The writer also thanks Ms. Budi Lestari, Ms. Ida Dorojatun, Ms. Yuan Leni, Mr. Dwi Nuh Riyadi, and Mr. Yuswibowo as a laboratory assistant of biochemistry laboratory, Faculty of Medicine, Gadjah Mada University.

## **REFERENCES**

1. Giam, C.K. dan Teh, K.C. Ilmu Kedokteran Olahraga. Jakarta: Binarupa Aksara, 1993.
2. Kartawa, H. Pengaruh Program Senam Kesegaran Jasmani terhadap Tingkat Kesegaran Jasmani Usia Pertumbuhan Cepat dan Usia Dewasa. M Med Indones 1997; 32 (4): 191-6.
3. Rost, R.E. Cardiovascular Incidents during Physical Activity. Int J Sport Cardiol 1993; (2): 11-8.

4. Gervino, E.V. and Douglas, P.S. The Benefits and Risk of Endurance Exercise. *Int J Sport Cardiol* 1993; (2): 73-8.
5. Murray and Udermann, E.B. Fluid Replacement: A Historical Prespective and Critical Review. *Int Sports J* 2003; 7(2): 58-64.
6. Foss, L.M. *Physiological Basis for Exercise and Sport*. New York; McGraw Hill Book Company, 1998.
7. Len, J., Davies, C.T., and Young, K. Changes in Indicators of Inflammation After Eccentric Exercise of the Elbow Flexors. *Med Sci Sports Med* 2002; 25: 236-9.
8. Halliwell, B. and Gutteridge, J.M.C. *Free Radical in Biology and Medicine*. 3<sup>rd</sup> ed. New York: Oxford University Press Inc, 1999.
9. Shojaei, E.A., Jafari, A., and Farajov, A. Effect of Acute Moderate Aerobic Cycling on Systemic Inflammatory Responses in Young Untrained Men. *Sci Sports* 2010: 1-5.
10. Harjanto. Recovery From Oxidative Stress in Physical Exercise. *JKY* 2004; 12 (3): 81-7.
11. Cooper, K.H. Sehat tanpa Obat: 4 Langkah Revolusi Antioksidan terjemahan dari *Textbook of Antioxidant Revolution*. Bandung: Kaifa, 2001.
12. Clarkson, P.M. and Thompson, H.S. Antioxidant: What Role do they Play in Physical Activity and Health. *Am J Clin Nutr* 2000; 72 (2): 637s-46s.
13. Wiralis dan Purwaningsih, E. Pengaruh Pemberian Jus Jambu Biji (*Psidium guajava* L.) terhadap Volume Kaki dan Kadar ion Nitrit Adjuvant Induced Arthritis Tikus Wistar. *M Med Indones* 2009; 43(4): 188-96.
14. Parimin, S.P. *Jambu Biji Budidaya dan Ragam Pemanfaatannya*. Jakarta; Penebar Swadaya, 2006.
15. Astawan, M. *Sehat dengan Buah*. Jakarta; Dian Rakyat, 2008.
16. Sherwood, L. *Fisiologi Manusia dari Sel ke Sistem (Human Physiology: From Cells to Systems)*. Edisi 2. Alih Bahasa: Pendit, B.U. Jakarta; EGC. Jakarta, 2001.
17. Cooper, K.H. Sehat tanpa Obat: 4 Langkah Revolusi Antioksidan terjemahan dari *Textbook of Antioxidant Revolution*. Bandung; Kaifa, 2001.
18. Sukmawati, D. Stres Oksidatif, Antioksidan Vitamin dan Kesehatan. *MKI* 2005; 2(2): 239-253.
19. Sjodin, B., Hellsten, Y., and Apple, F.S. Effect of Sprint Cycle Training on Activities of Antioxidant Enzymes in Human Skeletal Muscle. *J Appl Physiol* 1996; 81: 1484-7.

20. Tesis Tutu, Y. Jumlah Leukosit dan Persentase Neutrofil pada Latihan High Impact setelah Pemberian Kombinasi Vitamin C dengan Bioflavonoid. [Tesis]. Yogyakarta; Program Pascasarjana Universitas Gadjah Mada Yogyakarta, 2005.
21. Baratawidjaja, K.G dan Rengganis, I. *Imunologi Dasar* edisi ke 8. Jakarta; Balai Penerbit FKUI, 2009.
22. Sadikin, M. *Biokimia Darah*. Jakarta; Widya Medika, 2002.
23. Corwin, E.J. *Patofisiologi* (Terjemahan oleh Pendit, B.U.) Jakarta; EGC, 2001.
24. J Junqueira, L.C., Carneiro, J., and Kelley, R.O. *Histologi Dasar* (Terjemahan oleh Tambayong, J.). Jakarta; EGC, 1998.
25. Guyton, A.C. and Hall, J.E. *Buku ajar fisiologi kedokteran* (Textbook of medical physiology). Edisi 11. Alih Bahasa: Irawati, dkk. Jakarta; EGC, 2008.
26. Shojaei, E.A., Jafari, A., and Farajov, A. 2010. Effect of Acute Moderate Aerobic Cycling on Systemic Inflammatory Responses in Young Untrained Men. *Sci Sport*. 2010: 1-5.
27. Radom-Aizik, S., Zaldivar, F., Leu, S., Galassetti, P., and Cooper, M. Effect of 30 min of Aerobic Exercise on Gene Expression in Human Neutrophils. *J. Appl. Phys* 2008; 104: 236-243.
28. Sutarina dan Tambunan. Pemberian Suplemen Vitamin C dan Vitamin E pada Olahraga. *Majalah GizMindo* 2004; 3(9): 14-15.
29. Harjanto. Antioksidan dan Latihan Olahraga. *Yarsi* 2006; 14 (1); -070 – 077.
30. Alessio, H.M. Exercise-induced Oxidative Stress. *Med Sci Sports Exerc* 1993; 25: 218-24.
31. Tesis Ambardini, R.L. Efek Pemberian Panax ginseng terhadap Kadar Malondialdehyde (MDA) dan Superoxide Dismutase (SOD) Darah pada Latihan Fisik Aerobik Intensitas Sedang [Tesis]. Yogyakarta; Program Pascasarjana Universitas Gadjah Mada, 2005.
32. Selman, C., McLaren, J.S., Collins, A.R. and Speakman, J.R. Voluntary Exercise Has Only Limited Effects on Activity of Antioxidant Enzymes and Does Not Cause Oxidative Damage in a Small Mammal. *J Nutr* 2002; 132: 1784S-6S.
33. Stupka, N., Tarnopolsky, M.A., Yardley, N.J., and Phillips, S.M. Cellular Adaptation to Repeated Eccentric Exercise-induced Muscle Damage. *J. Appl. Phys* 2001; 91(10): 1669-78.

34. Alessio, H.M., Goldfarb, A.H., and Cao, G. Exercise-induced Oxidative Stress Before and After Vitamin C Supplementation. *Int J Sport Nutr* 1997; 7(1): 1-9.

Collaboration with



Fakultas Ilmu Keolahragaan  
Universitas Negeri Yogyakarta

ISBN 978-602-8429-66-5



9 786028 429665