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The 4th ISMINA

**THE 4th INTERNATIONAL CONFERENCE
ON PHYSICAL EDUCATION, SPORT AND HEALTH (ISMINA)
AND WORKSHOP**

"Enhancing Sport, Physical Activity, and Health Promotion for a Better Quality of Life"

PROCEEDINGS

APRIL 12th, 2017

**Auditorium of Semarang State University
(UNNES), Indonesia**

APRIL 13rd, 2017

**Laboratory of "Prof. Soegijono" Sports Science Faculty,
Semarang State University (UNNES), Indonesia**

**SPORTS SCIENCE FACULTY
UNIVERSITAS NEGERI SEMARANG**

Hub of Sports and Health Science



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ACTIVITY, AND HEALTH PROMOTION
FOR A BETTER QUALITY OF LIFE**

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Semarang – Central Java, Indonesia

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UNIVERSITAS NEGERI SEMARANG**

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The Rector's Word



It is my pleasure to welcome all the speakers and participants of the 4th International Conference on Physical Education, Sports and Health (ISMINA) at Universitas Negeri Semarang or UNNES. This remarkable conference is a part of the 52nd Anniversary of Universitas Negeri Semarang. The theme of this event is 'Enhancing sports, physical activities and health promotion for a better quality of life'. The theme itself is in line with UNNES' vision to become a conservation-minded university with international reputation.

Conservation at UNNES is not designed within a restricted sense but it widely covers three pillars: environment, characters and culture. The theme of this conference has covered all three pillars. The health promotion issues represent an effort to build a habitable environment. The enhancement of physical activities has covered the movement to promote sportsmanship. Sportsmanship is very important character for athletes and non-athletes around the world. Maintaining the culture of sports represents UNNES' effort to proliferate cultural conservation.

I believe that we meet here to discuss on crucial matters of humans wellbeing. We are living in an era where technology has been developing in an unprecedented pace. Our lifestyles have been affected heavily and now most of us sit in front of our computers in a lengthy period instead of doing meaningful physical exercise. Pollution and food enhancement chemicals are parts of our daily lives. The risk of people getting serious diseases is increasing and we have to do something about this. This conference is one of our efforts to solve world's problem.

Last but not least, I would like to extend my deepest gratitude to the invited speakers and instructors who have come to this conference to share your important ideas to the world. Your contribution is highly appreciated by UNNES and by all sports and health community members who attend this event. Do not forget to enjoy your time while you are staying in Semarang and especially your visit at Universitas Negeri Semarang.

Sincerely yours,

Prof. Dr. Fathur Rokhman, M.Hum.
Rector of Semarang State University (Unnes)

Preface from Dean of Sports Science Faculty



Beginning on almost 10 years ago, Faculty of Sports Science UNNES, conducted regularly international conference to nurture its academic atmosphere. Today, I am more than delighted to write a preface on this proceedings. The 4th International Conference on Physical Education, Sports and Health (ISMINA) also become our contribution to our beloved university anniversary, Universitas Negeri Semarang. The conference aims to serves as a platform which allows scholars, professionals, researchers and sports technocrats to share and discuss the latest knowledge and findings with the purpose of transforming a revitalization and rethinking in the effort to encourage investment in the program of Physical Education, Sports and Health as well.

Hopefully, all the presented issues can be understood and can be implemented operationally in the development of physical education, sports and health through this scientific meeting forum, involving scientists, stakeholders, and observer of sports and health.

I would like to deliver our highest respect and appreciation to Rector of Unnes, Prof Fatkhur Rokhman MHum, all the keynote speakers, Prof. Wanchai Boonrod, PhD (Dean of faculty of Sports Science, Chulalongkorn University Thailand), Ass. Prof. Koh Koon Teck, PhD (Assistant Head of Graduate Program PESS-NIE NTU Singapore), Dr. Jihane Tawilah (WHO Representative to the Republic of Indonesia) all the steering committee and scientific board member. Also allow me to express my gratitude to the participants and audiences from Indonesia and other foreign countries who are enthusiastic in attending this precious conference. I do hope that all audiences will gain important values and collaborate it into our own fields and make crucial changes in the future. Besides that, I also convey my appreciations to all of organizing committee who has given their outstanding commitment for presenting this international seminar and forum.

Sincerely yours,

Prof. Dr. Tandiyo Rahayu, M.Pd.
Dean of Sports Science Faculty, Semarang State University (Unnes)

Preface from Ismina 4 Chairperson



Welcome to the 4th International Conference on Physical Education, Sport, and Health (ISMINA) and Workshop. It is projected to be an international event in physical education, sport, and public health field and aimed to become one of the benchmarks on sport, physical activities, as well as health promotion and education events, especially in Asia or even in international scale. This conference is the 4th series of previous conferences held in 2009, 2011, and 2013 hosted by Universitas Negeri Semarang

This conference is a great opportunity to gather all knowledge and practices on sports, physical activities, as well as health promotion to achieve healthy lives and promote well-being for all people at all ages.

We wish to express our sincere appreciation to all of the honorable Keynote Speakers, Prof. Wanchai Boonrod, PhD (Dean of faculty of Sports Science, Chulalongkorn University Thailand), Ass. Prof. Koh Koon Teck, PhD (Assistant Head of Graduate Program PESS-NIE NTU Singapore), Dr. Jihane Tawilah (WHO Representative to the Republic of Indonesia), Prof. Dr. Tandiyo Rahayu, M.Pd (Dean of Faculty of Sports Science, Universitas Negeri Semarang Indonesia), and all participants for their valuable contributions, and also to the ISMINA 2017 committee for their excellent works in organizing this event.

Thank you for joining us in Semarang on 12th – 13th April 2017. Your presents give contribution to make the ISMINA 2017 an outstanding scientific meeting and an opportunity to prepare experts for present and future. Welcome to ISMINA 2017, welcome to Semarang.

Your faithfully,

Dr. Henny Setyawati, M.Si.
Chair Person of International Conference of ISMINA 2017

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PROFILE OF PHYSICAL CONDITION: SPEED, ENDURANCE, AGILITY, AND EXPLOSIVE POWER OF 15 YEARS OLD FOOTBALL SCHOOL STUDENTS (SSB) OF ELITE AND NON- ELITE LEVEL IN YOGYAKARTA SPECIAL REGION PROVINCE

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Abstract

This research intends to investigate the profile of the physical condition of speed, endurance, agility, and explosive power of 15 years old Football School (SSB) students of elite and non- elite level in Special Region of Yogyakarta Province. The method used was by survey where each sample consisted of 30 students at the elite and non-elite group. The physical condition components of 15 year age SSB students of elite level has average speed 6.91 seconds measured by 50 m sprint, aerobic endurance average 48.7 cc / kg / minute, agility average 18.33 measured by shuttle run, and leg muscle explosive power average 52.80 cm, while the non-elite level has speed profile average 8.28 seconds, durability average 39.43, agility average 19,46, and explosive power average 48 cm with 50 m run speed measurement test, aerobic endurance, agility by shuttle run test, and leg muscle explosive power by vertical jump test.

Keywords: speed, endurance, agility, explosive power, Football School

INTRODUCTION

The football competitions run by FIFA with the organizations below in continental, the sub-continent, until the nation levels continue to grow. The World Cup is the most prestigious football competition run by FIFA. The World Cup is held every four years since 1904. The last World Cup was held in Brazil in 2014 where Germany won the World Cup trophy for the 5th times since the World Cup was held for the first time. How is the position of Indonesia in the World Cup? Indonesia as a nation has never been reported participating in the World Cup finals.

The Indonesia national football team has not been able to get the pride achievement. The Indonesian national team reached the highest official achievement in the Sea-Games champion event champion in 1991, after that, the national team has never achieved achievement in official event. The Indonesia national football team that competed at the Sea- Games Singapore 2015 was even embarrassing defeated 5-0 by Thailand in semi-final round and lost 5-0 from Vietnam in the bronze medal or ranked 3rd.

Bompa (2015) states in order to achieve optimal performance of an athlete, he or she should do some: physical, technical, tactical and psychological preparation. Exercise in sports is something that is related to one another but the physical factor form the basis of the development of other factors. Technical and tactical factors should be prepared after the physical factor and the final determinant is psychological readiness to become a champion or perform optimally. The physical condition according to Bompa (2015) has to be prepared in training. The periodization of physical training is set at the beginning of the training where common physical conditions are held 2-3 months and the physical condition for certain sport is held 2-3 months before the competition. The physical condition training at the competition time is intended only to get perfection or maintain the conditions that have been achieved at the preparation time.

The characteristics of the football game requires every player able to run slowly (jogging), sprint, kick, intercept, heading the ball and all those physical activities should be performed for 2 x 45 minutes or 90 minutes adult football, 2 x 40 minutes or 80 minutes for junior football, and 2 x 20 minutes for under 12 years old players. Based on the data taken through several studies, (Reily: 2003) states that the distance covered by a football player when playing is 7000-12000 m.

In addition to running activities for a long time, a footballer has also to be able to kick the ball hard, dribble nimbly and quickly, have good balance when doing body charge, good coordination to anticipate the movement of opponents and the and the moving ball. The physical condition required by footballer is relatively complex; almost all components needed when playing. FIFA as an organization that is responsible for the development of football in its website in 2004 disseminates data about the characteristics of elite football players. Characteristics of modern football games in fact can be performed by the characteristics possessed by football teams with players who have technical, tactical, mental, physical abilities as can be seen in Table 1 below.

Table 1 Characteristics of Elite Football Players According to FIFA

Height	181 cm
Weight	74 kg
VO2 Max	60-65 cc
10 m Sprint Speed	1"78
20 m Sprint Speed	2"89
60 m Sprint Speed	7"43
Vertical Jump	63 cm

Source: fifa.com

The physical condition of football player evidently has an important role when considering the results of the research. The above list more specifically states that the cardiorespiratory endurance component is the main asset for a football team to excel. The physical condition is an important factor that must be prepared by a football coach if the team led wants optimal performance (to be a champion) in a competition. Bompa (2015) states that physical condition of the basic ability that must be developed and built for athletes or sportsmen, including in football players. The physical condition is a major component that must be solidly built so that the techniques and tactics can be performed according to the needs. An athlete or a football team that does not have good physical condition ability should not expect the targets to be champions.

The physical condition of football players grow and develop progressively since they start training from young until adult age. Football school is an organization or institution conducting football development from 7-15 years old. Football school provides very important basic skills, including coaching of physical condition, if this is not done then at any time until the achievement the objectives will not be achieved. Based on the description above, the researcher wants to know the physical condition of specifically components; speed, endurance, agility and explosive power of 15 years old Football School Students (SSB) in elite level and non-elite level in Province of Yogyakarta Special Region.

RESEARCH METHOD

The research was survey research on major components of the physical condition of 15 years old Football School Students (SSB) in elite level and non-elite level in Province of Yogyakarta Special Region. The research samples were 30 students of elite group and 30 students of non- elite group. Criteria of elite sample group are the best SSB students Yogyakarta selected by the researcher with consideration of main team players in their team/ Football School, ever won football competition between SSB in provincial level while the sample criteria of non-elite are students of SSB in Yogyakarta selected by the researcher with consideration of students of substitution players in SSB and has never won SSB competition at provincial level. The instruments used were 50 m sprint test, vertical jump test, multistage tests, and back and forth run test (shuttle run).

RESULTS

The measurement on components of speed, endurance, agility, and explosive power of 15 years old football school students of elite and non-elite level in Yogyakarta Special Region Province are obtained the results as follows:

Table 2. Profile of Physical Condition Components of Speed, Endurance, Agility, and Explosive Power of 15- Years Old Football School (SSB) Students of Elite Level in Yogyakarta Special Region Province

Physical Component	Average	Highest	Lowest	Unit
Height	161,20	173	152	Cm
Weight	53,50	57	51	Kg
Endurance	48,7	53,1	40,5	cc/Kg.Minute
Speed	6,91	6,24	7,43	Second
Agility	18,33	17,10	19,40	Second
Leg Power	52,80	63	34	Cm

Table 3. Profile of Physical Condition Components of Speed, Endurance, Agility, and Explosive Power of 15- Years Old Football School (SSB) Students of Non- Elite Level in Yogyakarta Special Region Province

Physical Component	Average	Highest	Lowest	Unit
Height	151,2	166	136	Cm
Weight	38,5	48	35	Kg
Endurance	39,43	44,5	37,1	cc/Kg.Minute
Speed	8,28	7,13	9,57	Second
Agility	19,46	18,3	21	Second
Leg Power	48	60	36	Cm

The research results can be used as guidance of football school coaches in Yogyakarta Special Region Province that want to optimize their students. The difference between elite and non- elite groups can be read in details seen in Table 4 below:

Table 4. Comparison of Physical Condition Profile of 15- Years Old Football School (SSB) Students of Non- Elite Level in Yogyakarta Special Region Province

Physical Component	Elite Group	Non- Elite Group	Unit
	Average	Average	
Height	161,20	151,2	Cm
Weight	53,50	38,5	Kg
Endurance	48,7	39,43	cc/Kg.Minute
Speed	6,91	8,28	Second
Agility	18,33	19,46	Second
Leg Power	52,80	48	Cm

DISCUSSION

The physical components have correlation or significant effect on performance or achievement of athletes. The research results of (2002) claims that there is significant correlation between aerobic fitness and anaerobic power on the elite football player performance. The components of endurance, speed, agility, and leg muscle explosive power between elite and non-elite groups have significant differences. The results are in line with the theory that to achieve optimal achievement according to the sport needs that must be prepared and owned by a player or an athlete. The main physical components are endurance, speed, and power in this research are represented by the aerobic endurance measured by using multistage test, the speed by 50 m sprint, agility measured by back and forth run test (shuttle run), power represented by leg muscle explosive power measured by vertical jump test.

Good aerobic endurance is very supportive to a football team to be able to play in quick playing pattern (Bangsbo, 1991). The research results conducted by Abdul Aziz Rashid *et al* in 2002-2004 on the players at Singapore League clubs show that the final ranking standing has the correlation to aerobic endurance ability. More can be read in Table 5 and 6.

Table 5 Measurement Results of Physical Condition (Aerobic Endurance Measured by Multistage Shuttle Run Test Related to the Club Ranking in Singapore Football League Season 2002

Club	Number of player tested	MST	Number of matches			Goals for	Goals against	Goals difference	percentage of matches won	Total points	Ranking
			Won	Drawn	Lost						
L	10	121+13	21	2	5	90	30	60	75	65	1st
I	15	122+16	20	0	8	83	36	47	69	60	2nd
O	12	119+11	17	3	8	74	44	30	65	54	3rd
D	13	120+11	17	2	9	60	43	17	56.2	53	4th
C	11	122+3	13	8	7	55	42	13	46.3	47	5th
E	14	115+12	11	9	8	67	49	18	42.1	43	7th
A	15	129+16	11	7	10	44	30	14	33	37	6th
B	10	111+11	7	2	19	56	73	-17	21.1	23	8th
N	17	119+3	5	5	18	40	60	-40	16.6	20	9th
M	18	110+4	3	5	20	30	67	-37	13.3	14	10th

Table 6. Measurement Results of Physical Condition (Aerobic Endurance Measured by Multistage Shuttle Run Test Related to the Club Ranking in Singapore Football League Season 2003

Club	Number of player tested	MST	Number of matches			Goals for	Goals against	Goals difference	percentage of matches won	Total points	Ranking
			Won	Drawn	Lost						
D	13	116+12	20	3	4	76	29	47	74.1	63	1st
B	15	120+15	17	2	8	76	43	33	63	53	2nd
N	14	109+10	14	5	8	74	52	22	51.9	47	3rd
A	14	117+16	14	3	10	45	48	-3	51.9	45	4th
O	16	132+4	12	8	7	50	42	8	44.4	44	5th
E	11	124+10	12	4	11	48	49	-1	44.4	37	7th
C	14	126+9	10	7	10	43	43	0	37	40	6th
K	14	114+10	6	2	19	36	73	-37	22.2	20	8th
M	13	120+7	4	5	18	36	62	-26	14.8	17	9th
L	14	120+10	4	5	18	29	72	-43	14.8	17	10th

Based on research results of Abdul Rashid, thus it can be stated that the components of cardiorespiratory endurance (aerobic endurance) are the physical components which are important to a football team to achieve highest performance.

The results of the second research is the explosive power component of leg muscle of the elite group has an average result 52.80 and the non-elite group 48 cm, which means the elite group has leg muscle explosive power better than the non-elite groups. The leg muscle explosive power has an important role in supporting the techniques in kicking the ball. The long shot technique requires good leg muscle explosive power. The shot aimed to score (shooting) must be done strongly (kicking the ball in high speed) so that it is not easily anticipated by the goalkeeper. The string kicking/ shot if biomechanically analysed has the following provisions:

$$V_{\text{ball}} = 1.2 \times V_{\text{foot}} + 2,72 \text{ (Adrian Lee, 2001)}$$

With this provision, the leg muscle explosive power affected by the power and muscle speed components in the weight-bearing is very important role in supporting the performance of football player. The leg muscle explosive power plays an important role to perform kicking technique toward the goal (shooting) and to perform long pass techniques.

The ability of speed and agility shows the similar results with the aerobic endurance and the explosive power component, the elite group has better average ability compared to non-elite group. In the context of young players with better speed and agility, then a football player will be easier to move quickly to do feinting techniques or movement combinations to create opportunities and ultimately the team can score a goal. The essence of football game is a team that scores more goals is the winning team, so that by the speed and agility ability, that would be easier to create chances to score. Many scoring chances mean a football team has greater chance of winning more games.

The characteristics of physical ability on athletes differ among sports, in football especially, regarding the research results can be used as standard or target if team coach intends to perform optimally. The further research would be more interesting for instance on how the characteristics of the physical ability for each different position. Football consists of playing positions such as goalkeeper, center back, right or left back, central midfielder or a winger, striker or attacking midfielder. Leslie Andrews

Portes (2015) finds that goalkeeper and defenders are taller than midfielders and strikers. The agility and aerobic endurance of each position is insignificant for young elite football athletes.

CONCLUSION

The research results show significant differences in the components of the physical condition of aerobic endurance, speed, agility and leg muscle explosive power in elite and non-elite groups of 15 years old SSB students in Yogyakarta Special Region Province. The elite group has the average ability better than the non-elite especially in terms of endurance which strongly supports football players to be able playing consistent for eighty minutes in the teen's football game. The aerobic endurance is a very important determinant component to support the performance of a football team to win the game.

The results of this research are very useful for football coaches or the football school board by referring to this research, the training process should be directed to achieve the targeted physical condition as generated. Other components of physical condition do not mean unimportant but the dominant physical component in sport should be special concern so that the expectations in sport coaching development process can be achieved.

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