

## Small-Sided Games Against Aerobic Endurance

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### Abstrak

Penelitian eksperimen ini bertujuan untuk mengetahui pengaruh latihan small-sided games terhadap daya tahan aerobik siswa SSS Real Madrid Universitas Negeri Yogyakarta.

Penelitian ini menggunakan metode eksperimental. Populasi penelitian ini ialah seluruh siswa SSS Real Madrid Universitas Negeri Yogyakarta Umur 9-10 tahun sebanyak 17 orang. Perlakuan diberikan selama 16 kali pertemuan (tiga kali perminggu) dengan tes awal dan tes akhir. Teknik pengumpulan data menggunakan dengan tes dan pengukuran. Teknik analisis data menggunakan analisis *t-test*, melalui uji prasyarat uji normalitas, dan uji homogenitas.

Hasil pengujian hipotesis penelitian dengan Analisis T-Tes menggunakan program SPSS 19, taraf signifikansi 95% ( $\alpha = 0,05$ ), diperoleh nilai *t* test sebesar 11,9 lebih besar dari *t* tabel  $\alpha = 0,05$  dk(1) (17) sebesar 2,12. Dimana ( $t_{hit} = 11,9 > t_{Tabel} = 2,12$ ) yang artinya hipotesis nihil yang menyatakan tidak ada pengaruh yang signifikan latihan small-sides game terhadap daya tahan saerobik ditolak. Kesimpulannya terdapat pengaruh yang berarti latihan smal side game terhadap daya tahan aerobik pada permainan sepakbola.

Kata kunci: Small-side games, Daya tahan aerobik

### Abstrak

This experimental study aimed to investigate the effect of small-sided games against aerobic endurance Real Madrid SSS students Yogyakarta State University.

This research uses experimental methods. The population of this study is that all students in the SSS Real Madrid Yogyakarta State University Age 9-10 years as many as 17 people. Treatment administered for 16 sessions (three times per week) with the initial test and final test. Data collection technique used to test and measurement. Data analysis techniques using *t-test* analysis, through prerequisite test normality test, and homogeneity tests.

The results of hypothesis testing with T-test analysis using SPSS 19, significance level 95% ( $\alpha = 0.05$ ), *t* test values obtained at 11, nine more than *t* table  $\alpha = 0.05$  (1) (17) of 2.12. Where ( $t_{hit} = 11.9 > t_{table} = 2.12$ ), which means nil hypothesis which states there is no significant effect smal exercise endurance side game against aerobik rejected. In conclusion there is a significant effect of exercise small-side game against aerobic endurance in soccer games.

Key word: Small-sided games, Aerobik Endurance

## A. Preliminary

Football is a game of interest by all people in both rural and urban. The game of football played by all age groups, not just young people or adults only but children with cool to play the ball. Football requires some skill to use the ball as kicking, driving, stopping and headed home. Football is a sport game that requires several components of physical conditions such as: speed, flexibility, agility, strength, anaerobic endurance, and that no less important is aerobic endurance. Good football players can not form spontaneously, but through a process of gradual and continuous exercise. Soccer drills and early recognition is expected to form a football player to the name of the nation and the national and international arena. To become a qualified football players would have to pass through various stages of training, the stage is in the form of football practice at the start of a new age of 10-12 years at the multilateral stage, age 13-15 at the stage of specialization, age 18-24 years was the crowning achievement (Bompa, 1994: 36). Coaching football athletes starting at an early age a key establishment and a great athlete and a gifted athlete selection will be the foundation of success for higher achievement in the future. Achievement athletes can not be obtained in a short time, but it takes a long time. Success in achieving maximum performance is supported by a variety of factors. According Soeharno (1990: 02)

A In general, the factors that determine the maximum achievement is a factor, indogen, and exogenous. Indogen factors consist of physical and mental health, a perfect mastery of technique, physical condition and physical ability, mastery of tactical problems, and psychological aspects of a good personality and has the maturity of a steady winner. While exogenous factors consist of coaches, financial, tools, equipment, places, organizations, environments, and the participation of the government.

Football game allows players to use one's entire body, except the hands and arms. Only the goalkeeper is allowed to use all of his limbs. Associated with the game of football M. Anwari Irawan (2007: 2) says:

Football is a sport with a high-intensity intermittent / stop and shake requires strength and endurance for 90 minutes. And depending on the level and the involvement of a player in a practice / game of football, the sport activity is a combination of activities that are aerobic and anaerobic. Activity in aerobic sport that is usually an activity or low-intensity activity such as walking and jog. Such activities are usually carried out by a defender when the team is attacking or also performed by forward when his team survived. While anaerobic digestion in a sport Football is a high-intensity activities such as sprint to catch the ball/ opponent, run venture (cruising), dribling ball, jump, tackle or kick the ball well.

Basic techniques of playing football to be owned and controlled by a football player are: kicking (kicking), stop (stopping), lead (dribbling), heading (heading), rob (tackle), throw-in (throw-in), and keep the goal (goal keeping). In the game of football a player deal with the situation and

the pressure on the ground, either because of time, space or opponent. Fatigue experienced by a player will greatly affect the ability of the technique, mental, and concentration. To bermainan football properly, a player must be equipped with the basic skills of football which is supported by excellent physical and mental health of a player.

Athletes should strive to attain high achievement, and preparation necessary to achieve a relatively long time. Preparation is one of them concerning the preparation of the physical condition. Athletes must be nurtured and improved his physical condition before attending the actual game, so the athletes are ready to face the pressures that arise in the game either mental stress or physical strain. Explanation Similar expressed Harsono (1988: 153), parachuted into the stadium before the match, an athlete must have been in a physical condition and fitness level is good for dealing with labor intensity and all kinds of stress that will be faced in game.

Development of children should always be monitored and should not be ignored. Failure to invest time, attention, and guidance will have long term effects for children. If the child fails to develop properly so they can not reach our potential to the fullest. Children grow, develop, and learn throughout their lives. It is the belief that many generations of children love bermainan, almost all childhood used to play. Model exercise football fun / exciting will affect the psychology of the child against the ongoing process of long-term exercise. With this type of training a fun children will be excited and not bored of training materials. Creating an innovative model of training for early childhood affects the development and growth of children.

In the age 9 to 10 years is a period in which the children love to play continuously, it seems that age is no fatigue felt by the child. This age group is the best group in the study of all kinds of soccer skills such as juggling, driving, stop the ball, or shoot the ball. Physical boundaries such as balance, endurance, coordination was to show to friends and family.

Physical conditions can reach the optimum point when training begins at an early age and performed continuously with physiological state planning growth and development of children. To develop the physical condition is not an easy job, should be smart to intensity, frequency, volume of course adapted to the child's age. Good physical condition has several advantages, such as athletes capable and relatively easy to learn difficult skills, not easily tired during training and matches, training programs can be completed without having a lot of problems and can solve a tough problem.

Stages of Exercise according to Joko yell Irianto (2002: 59-61), in order to obtain optimum results the exercise carried out in stages, namely: (1) Introduction, (2) Heating (Warm-up), it aims to prepare job physiological systems of the body, while the psychological aims to improve concentration and reduce anxiety, (3) Core training (main exercise), this stage contains the main exercises that include physical exercises, techniques, tactics or mental. The proportion depends on periodization training exercises, such as the exercise portion of the preparation

period at most, otherwise the period of the competition given the proportion of mental exercises the most, (4) Nurture (Cool-Down).

Sukadiyanto (2002: 14) includes individual training principles, adaptation, overload (overload), progressive, specifications, varied, heating and cooling, periodization, contrast, moderate weight, and exercise should be systematic. At the start of football practice, should be applied to a model of practice that can be introduced to the children that football is a fun and healthy sport. Avoid excessive exercise for the novice player. Coaches or parents do not impose a heavy training program for young players. By forcing a hard workout at the beginning of the exercise and the age of the young will lead to dysfunction in adulthood.

Resistance or endurance in the sport known as the body's ability sportsman equipment to fight fatigue during activity or work (Sukadiyanto, 2010:7). Endurance will have an impact on the quality of the cardiovascular, respiratory and circulatory systems. One factor that is important in the game of football is the long-term survival, because the length of time spent in the game. Long-term survival is the necessary endurance during exercise / activity for more than 8 minutes. Resilience is almost all its energy needs are affected by oxygen (aerobic system) as the primary source of exercise / activity.

Aerobic endurance is the ability of the body to supply oxygen needed during physical activity. The need to increase oxygen in the body during exercise and physical activity. Through a chemical reaction of oxygen processed into heat and energy. Therefore we need a balance of oxygen, the ability to supply oxygen to do physical activity. The maximum rate of oxygen consumption plays an important role in aerobic endurance. This figure varies with age and gender. Generally, the highest oxygen consumption while in their 20s.

Physical characteristics can determine your level of aerobic endurance. One source of oxygen that the body relies upon physical activity is of a muscle fiber. Myoglobin is a protein found in muscle oxygen stores and give them red muscle fibers. Type determines the amount of muscle present in muscle myoglobin. Physical characteristics can determine your aerobic endurance levels. One source of oxygen that the body relies on during physical activity is from muscle fibers. Myoglobin is the oxygen-storing protein found in muscles and gives muscle fibers their red color. The muscle type determines the amount of myoglobin present in muscles.

Aerobic endurance is the body's resistance against the system that drives the work load of the heart, blood, and lungs for a relatively long period of time, and the effect on the increased strength of the respiratory muscles that allow air flow quickly into and out of the lungs, the increased strength heart to pump more blood and oxygen to each pulsation, adds auto-strong muscles throughout the body. Endurance sports that do not require a quick movement, the formation of ATP occurs with aerobic metabolism. If enough oxygen, then 1 mole of glucose is completely broken down into CO<sub>2</sub> (carbon dioxide) and H<sub>2</sub>O (water), and enough energy to expend

resistesis 3 mole ATP. Necessary for the reaction of hundreds of chemical reactions and help hundreds of enzymes. This aerobic reaction occurred in the mitokhondria.

Small-sided games are a form of exercise that is made into the shape of a football game where size is reduced so that more and more touches on the ball, the movement is growing. Small-sided games in training process will be more fun because of the interaction with opponents and friends. The process of training a group, would be more fun to play than the individual exercises. Small-sided games to teach children to always play in the area and set targets. Small-sided games have several advantages such as that contained in the small-sided games Optus-football handbook are as follows:

1. More than 90% of parents reported that the children enjoyed playing football with the method of small-sided games
2. More than 91% of the children enjoying the atmosphere as a small-sided games to win.
3. More than 70% of parents support the small-sides games as a way to train the child.
4. More than 85% of parents rated the child more contact with the ball and is very active
5. More than 85% of parents feel comfortable with small-sides games
6. More than 80% of the child's ability to increase throughout the year.

On the field, many children are lazy, lacking even a stationary spirit while training, it can happen because of the content of the training session saturate, or less creative in developing an exercise program. Lack of a form of exercise that emphasizes real playing situation will be easy to make the child stop practicing. Exercise a lot of emphasis on drill a technique usually leads to boredom in children, a result of boredom will greatly affect the psychology of the child to participate in the exercise. Sometimes children will stop training because the exercises are not fun. Children will be happy / excited if the exercise was made to resemble the real game. Therefore, it is a model of a fun exercise but still have a goal to improve the skills of playing football and the physical condition of the child.

#### B. method

The method used in this study is the Experiment. Population and samples used in this study were students as Real Madrid UNY tritmen group, with 17 students aged 9-10 years. Instruments used in this study is TKJI durability tests (to determine aerobic endurance). Data collection techniques using test and measurement, while the analysis of the data used in this study is the normality test done to see if the data has a normal distribution distribution. T test conducted to determine whether there is a small exercise influence signifinact-sides games against aerobic endurance. The results of the analysis revealed a difference if there is a significance value of less than 0.05 ( $P < 0.05$ ).

Facilities and infrastructure used in this study is athletics track, stopwatch, various stationery, as well as balls, kone, and the goal for the workout small-sides games. Camera and handycamp to take pictures and recapitalize the data retrieval process.

### C. discussion

Exercise is a systematic process of training or work, which is done repeatedly, with more days training load or increase the amount of work (in Harsono Rusli Lutan 2000: 3) From this understanding can be explained, systematic process of training is conducted regularly, planned , use patterns and specific system, methodical, continuous from the simple to the complex, from the easy to the difficult, from a little to a lot, and the exercise takes place several times a week. Recurring meant that every movement must be trained gradually and done so many times that the original movement is difficult to do, lack of coordination becomes increasingly easy, automatic and reflective, so that the movements become more efficient.

Aim to enhance the skills of practicing as much as possible, in order to achieve that goal, there are four aspects of practice need to be trained carefully, namely: (1) physical, (2) techniques, (3) tactics, (4) mental. One of the principles is the active involvement exercise, here is a combination of business performance athletes and coaches in designing training skills. The principle of active involvement meant the two sides need to feel involved and responsible for achieving them. Coaches must be able to create exercise programs and athletes are required to carry out the program as much as possible from the coach.

Aerobic endurance is a unified whole of the components of physical conditions that can not be separated, either an increase or maintenance (Sajoto M., 1995: 8). Aerobics done with low or moderate intensity with a long time. Aerobic exercise can be maintained from fifteen to twenty minutes to a few hours on a single exercise (Sherwood, 2001: 34). Aerobic endurance is channeling energy system with the help of oxygen. Aerobic endurance is needed when performing activities within a long and continuous. Aerobic endurance lead to the development kardiorespirasi system, it will also affect the lungs, heart and blood vessels. The process by way of aerobic exercise requires oxygen to actively without incurring oxygen debt is not paid, then the process can take a long workout. Effect of the exercise is to increase the body's capacity to store and distribute oxygen throughout the tissues where oxygen is combined with nutrients to produce energy and support the motor movement.

Aerobic endurance exercise would lead to the adaptation of cardiovascular and respiratory systems, to someone who is not an athlete, then aerobic exercise will lower resting heart rate and maximum heart rate. Occurs also increase oxygen levels the difference in the arteries and veins. Besides a decline in systolic and diastolic blood pressure, decreasing peripheral resistance and increased lung vital capacity. The advantages of having a good aerobic endurance is as follows: (1) Strengthen the circulatory system, cardiovascular, (2) Strengthen the respiratory system, the lungs, (3). Improving the ability of the body's metabolism, (4) Improving energy.

Small-sided games are a form of exercise that is made into the shape of a football game where size is reduced so that a touch on the ball more and more. Small-sided games are a "form

of the game with a number of players less than 11 players in the field without goalkeeper. Maximum field size of 30 X 40 yards ". 30 X 40 yards equal to 27.522 x 36.697 meters ([http // www.wccysl.com/U6 Small-sided Games for 2003/2004](http://www.wccysl.com/U6%20Small-sided%20Games%20for%202003/2004)). The disadvantage in the Small-sided games: (1) at the time of exercise advantages / disadvantages of the players will be unemployed so that children do not exercise, (2) more depending on the opponent play, (3) lack of individual skills training focused on one person tends to be global not personal. Excess in Small-sided games methods: (1) contained many elements of technique, tactics and physical training in a small-sided games, (2) in this exercise so that there are opponents play like the real game and there are elements of mental exercises that provide practical trainer workout this to the athletes, (3) exercise is fun, (4) easily monitored by the coach for training small squares (WCCYSL, 2003: 1). sides small-Games is a model football practice by limiting the area (region). Can be used delimiters (cones) as a medium that determine large-small size of the field as needed training areas for learning, such as the size of 10 x 10 meters (Griffin, Linda L, et al, 1997: 20).

According to Ganesha Son (2004: 12) small-sided training games is a growing practice, with the present situation of the game that makes players gain mastery of technical, tactical, and physical as well. Exercise small-sided games more directly applying the physical exercise, techniques, and tactics in a game (games), which means the player is required to deal with the situation as if the pressure in a real game situation.

Appropriate training methods for athletes that practice early age by playing, because the kids still love the game character so that children feel happy and learning. The role of the coach is to utilize the properties of a child's joy is realized in practice soccer game, this will be a coach in an effort to diversify within each exercise in the form of a game, the coach must find a proper practice and in accordance with the characteristics and preferences of children faces. According to Tom Goodman (2004: 3) a variety of exercises, namely the small-sided games.

Small-sided games pleasing because with one ball grabs some children. All ages can play small-sided games, but more suitable for early childhood. Here are some of the reasons why I believe we, as soccer coaches, administrators and parents must guarantee that our young soccer players play small-sided games ([www.alabamayouthsoccer.com](http://www.alabamayouthsoccer.com)) :(1) Because we want our young soccer players to touch the soccer ball more often and become more skillful with it! (Individual technical development), (2) Because we want our young soccer players to make more, less-complicated decisions during the game! (Tactical development), (3) Because we want our young soccer players to be more physically efficient in the field space they are playing in! (Reduced field size), (4) Because we want our young soccer players to have more individual teaching time with the coach! Less players on the field and less players on the team will guarantee this! (Need to feel worth need to feel important), (5) Because we want our young soccer players to have more, involved playing time in the game! (More opportunity to solve problems that only the game presents), (6) Because we want our young soccer players to have more opportunity to play on both

sides of the ball! (More exposure to attacking and defending situations), (7) Because we want our young soccer players to have more opportunities to score goals! (Pure excitement).

Principles and practice basic small-side games are very important to consider in the process of training. To be able to implement small-sided training games required a correct understanding of the exercise dose to be given. For each age group, of course, a given dose and intensity will be different, it refers to the ability of the body varies according to age. According to Optus Small-Side Football Handbook dose for each age group exercise and fitness exercise duration and the number of sets performed, described as follows:

Playing Format	Under 6	Under 7 & 8	Under 9 & 10	Under 11 & 12
Numbers	4 v 4	5 v 5	7 v 7	9 v 9
Field Size	30m x 20m	30m x 20m	40m x 30m	60m x 40m
Field Markings	Markers or painted line markings	Markers or painted line markings	Markers or painted line markings	Markers or painted line markings
Penalty Area	Nil	Nil	8m length x 16m width	8m length x 16m width
Goal Size	Min: 1.80m x 0.90m Max: 2.00m x 1.00m	Min: 1.80m x 0.90m Max: 2.00m x 1.00m	Min: 4.80m x 1.60m Max: 5.00m x 2.00m	Min: 4.80m x 1.60m Max: 5.00m x 2.00m
Goal Type	Markers, Poles, Goals	Markers, Poles, Goals	Markers, Poles, Goals	Markers, Poles, Goals
Ball Size	Size 3	Size 3	Size 3	Size 4
Goalkeeper	No	No	Yes	Yes
Recommended Playing Time	2 x 15 minutes	2 x 20 minutes	2 x 25 minutes	2 x 30 minutes
Half Time Break	5 minutes	5 minutes	5 minutes	7.5 minutes

#### Optus, small-sided Football.

This study uses a field with size 40 feet x 30 feet with a composition of 7 vs 7 players with one person being a Goalkeeper. The ball used is number 4 with a time of playing 2 x 25 minute and 5-minute rest period. Before the core exercises was performed static and dynamic heating and cooling end with static and dynamic.

Application of small-sided games training in skills training process is considered capable of providing increased mastery training more effective, because by using boxes small exercise, and performed by some of the players will be easily supervised by coaches. Small-sided games are also a fun exercise for a sports game with the use of physical exercises and techniques in the



form of a game with the size reduced in size by the number of players is limited in size. The shape and size of the field is designed at a certain size, and the players involved in the exercise a certain amount, so the coach will be able to see, observe and provide corrections or detailed evaluation of the errors that occurred.

Exercise small-sided games is one alternative exercises that can be used in practice because in it there is a physical, technical, tactical and mental, small-sided games like the real game but with a reduced field size. The advantage in this exercise contains elements of many techniques, tactics and physical training in a small-sided games. In practice, there are opponents play so like the real game (make the atmosphere happy) and there are elements of mental rehearsal and characters that coaches provide practical exercises to athletes. Relation to the improvement of aerobic endurance is, in the small-sided game field size is reduced so that more kids running / moving (short sprints, stops suddenly, abruptly run). which will increase the aerobic capacity of children.

Coach was instrumental in carrying out the small-sided training games. The principles and philosophy of football to delight children should not be abandoned. Young children are very happy to participate in the game, victory is not a necessity but only part in the exercises. Never shout rude words because children are very sensitive, which would adversely impact the enjoyment of children. Always give encouragement, motivation in the small-sided training games. Ensure that all children obtain treatment and equal opportunity and not distinguishing differentiator. Make sure all equipment and small-sides games perlengkapan safe for use by children. Note the principles of growth and development.

#### D. Conclusion

From the research data obtained show an increase aerobic endurance through training small-side games. Exercise small-sided games showed a significant increase to improve aerobic endurance. Exercise small-sided games provide an atmosphere of fun with the children shown doing with passion and as if without feeling tired. Small-sided games are a football player sulosi to produce creative, innovative along with good physical ability. Joy and excitement can be found in small-sided games when scoring a goal, frequently got the ball, or the joy of running with the ball. Small-sided games also does not require a large field that is getting hard in the big cities.

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