

Capability Analysis of Maximal Oxygen Volume (VO₂max) Football Players

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Abstract – This research aims to know with certainty the ability of VO₂max football player Air Bangis. This type of research is descriptive. The population numbered 20 people, and all the population used as a sample. VO₂max is used to acquire a data bleep test instrument. Data analysis techniques using descriptive statistical formula results show that the ability of the players' VO₂max is the category average.

Keywords– VO₂max, football

I. INTRODUCTION

Sport is an activity that is often done by the community, its existence now it has become part of people's lives, because the sport today has become a community needs both parents, teens and children, because this sport has meaning not only for health, but more than it is as a means of education and even achievement.

In connection with the above, then the sport can make life healthier and fitter, and through sport can lift the national honor. As time goes on the development of science and technology today that progresses rapidly, causing a lot of friction values of life, be it social, cultural, economic, political, including the values of the sport itself. Sport which was formerly only intended as an attempt to improve the quality of the body, has developed into a multi-function, both for the sake of sports achievements, economic and political. Even today the sport has become an industry if it is packaged in such a way to become a commodity that has a sale value is quite high.

Indonesia continues to improve itself started development in all fields, including the development of sport in a strategic position and is part of the national development.

"National sports aims to maintain and improve health and fitness, achievement, human qualities, inculcate moral values and noble character, sportsmanship, discipline, cultivate and foster pesatuan and unity of the nation. Strengthen national defense, as well as raise the dignity, dignity and honor of the nation"[1].

The quote above implies that Indonesia's human development must take place in harmony between the physical quality improvement with intellectual development is accompanied by mental and spiritual. In addition, that should not be overlooked is the performance improvement that can

foster a sense of national pride through sports achievement. The dignity of a nation can be raised to sat together, and stand as tall as any other nation in the world.

Of the many sports that do in society, football is a sport most played not only in Indonesia but also throughout the world. The popularity of the sport of football seen from many fans, the number of spectators during the match and the high frequency of television viewing times, and so forth. Apart from that, football is a sport that can be done from childhood to adulthood.

Many football schools have been established and also the football club with the purpose is to prepare athletes excel in sport of football, one of which is PSAB Air Bangis. PSAB stands now been over 10 years. PSAB Air Bangis has been able to achieve some achievements at the local level, but since the last few years these achievements are likely to decline, it is likely caused by a lack of physical abilities particularly VO₂max the players, so it can not be played with a maximum of 90 minutes when the physical condition is one factor like major achievement. "Without a good physical condition may not be a able to cope with good technique" [2].

As a football team who want the maximum performance, then it should PSAB Air Bangis football player has the ability to good physical condition, especially endurance as durability is a key element needed for the game of football. Durability relates to a process that is capable of oxygen consumption consumed by the player per minute or better known as VO₂max (Maximal Oxygen Volume), VO₂max is expressed as a very large number where oxygen is normally consumed per minute. To be able to play with a maximum of 90 minutes then the player should have good VO₂max capabilities that technical ability possessed by the players to be effective and able to survive as long as the game progresses.

But the author of observations and information from the coach of the few games that followed the Air Bangis team looks a lot of players who have fatigue very significant, especially in the second half, so the technique tertanggu owned by the player and the game can not be continued to the maximum.

1. Maximal Oxygen Volume (VO₂Max)

a. understanding VO₂max

VO₂max is "the ability of the human respiratory organs to breathe in as much oxygen during exercise/physical activity"

[3]. "VO₂max is the maximum ability to consume oxygen in a minute" [4]. Thus it can be said that VO₂max is the ability to consume oxygen as much as possible with a good aerobic fitness characterized to support someone doing the job for a long time. Maximal Oxygen volume (VO₂max) is expressed as a very large number where oxygen is normally consumed during one minute.

Furthermore, VO₂MAX illustrate the effectiveness of the body to get oxygen and then sends to the muscles and other cells in the procurement and use of energy, at the time bersamaan remove metabolic waste that can inhibit physical activity. In other words, someone who VO₂Max well, has the heart of an efficient, effective lung, and blood circulation is also good to supply blood to the muscles, so concerned is able to work properly without experiencing significant fatigue.

From the above, oxygen can be taken if the drive power as closely as possible. How to improve VO₂max through workouts depending on the purpose and usefulness of the sport itself. In the exercise can be aerobic and anaerobic exercise. In the execution pamberian proper exercise must be harmonized with the training load and is given in this case would be able to increase VO₂max is the maximum.

The amount of sense to discuss the VO₂max it can be concluded that VO₂Max is the ability of the body to the maximum oxygen consumption per minute, then sent to the muscles or cells as fuel during the activity.

b. Factors that Determine VO₂max

The maximum volume of oxygen is one important factor to support the athlete's performance because they have a high VO₂max can train well and truly than those who do not have a good physical condition.

"Factors that affect VO₂max will limit the amount of energy that can be released aerobically are: (1) The ability of a chemical in a series of cells in the muscles to use oxygen in the use of oxygen; (2) The ability combined with the system pertaining to the lungs and cardiovascular to transport oxygen to the muscle tissue system" [5].

Some of the physiological functions involved in maximal oxygen consumption capacity factor, is :

"a) The heart, lungs and blood vessels to be functioning properly so that inhaled oxygen can get into the lungs, then to kedarah; b) The process of delivering oxygen to internal tissues by cells, red blood cells to be normal, the cardiac function should be normal, blood volume should be normal, the number of cells, red blood cells to be normal and the hemoglobin concentration should be normal and blood vessels must be able to divert blood from the network -Network inactive active keotot requiring greater oxygen; c) The heart, lungs and blood vessels to be functioning properly so that inhaled oxygen can enter the lungs keparu, next to kedarah ".

c. Exercises that can improve the ability of VO₂max

there are some physical exercise can increase VO₂max capabilities include:

1) 30:30 interval training

30:30 interval training is a combination of exercise performed with 30 seconds treated with 30 seconds recovery

2) Interval training uphill

Exercise uphill shorter intervals for 20-90 seconds beneficial to increase power, strength, and speed. but if you want to increase VO₂max then require a longer distance, approximately 2-3 minutes.

3) Long interval training

Length of interval training is a practice done by long distance away or examples of exercises with a distance of 800 meters at the beginning and then increase to a level much longer. Make up to a total of 5,000 meters with a fast and steady pace, namely 6-7 x 800 meters, 5 x 1000 meters, 4 x 1,200 meters.

II. RESEARCH METHODOLOGY

Type a descriptive study, the variables studied were VO₂max with a population of 20 people, the withdrawal of the total sampling technique so that a sample of 20 people. The instrument used to obtain the data is to bleep test. Data were analyzed using descriptive statistical formulas.

III. RESULT

Description of the data used in this research is to see how far the ability of VO₂max football player Air Bangis. From the results of measurements carried out by the researcher uses the test *Multistage Fitness Test* of the sample with the number of 20 people, gained an average capability VO₂max at 40.48, the mean (median) 40.2, 40.2 mode, standard deviation of 5.61 and a highest score of 50.8 and the lowest ognmd 28. 3. The results of measurement capabilities VO₂max Air Bangis football player presented in Table 1 below:

Table 1. Ability VO₂max Football Players Air Bangis

VO ₂ max	Frequency		Classification
	Absolute	Relative (%)	
> 53	0	0	Very Good
43-52	7	35	Good
34-42	12	60	Average
25-33	1	5	Poor
<24	0	0	Very Poor
amount	20	100	

From Table 3 above it can be seen the results of a thorough investigation of the ability of VO₂max football player Air Bangis that no player (0.00%), which has the ability to VO₂max on a score > 53 with classification Very Good, 7 players (35%) have the ability to VO₂max at intervals of 43-52 with good category. For the 34-42 interval there are 12 players

(60%) classified as average and is 1 player (5%) have the ability to $VO_2\text{max}$ at intervals of 25-33 with poor classification, and no player (0.00%), which has the ability $VO_2\text{max}$ on score <24 , with the classification very poor.

IV. DISCUSSION

Based on the results of measurements that have been done and has been described in the description of the data, it can be seen that most of the capabilities $VO_2\text{max}$ Air Bangis football player in middle category with the number of players as many as 12 people or by a percentage of 60%.

Based on the results of these measurements, the researchers can say that one of the main factors that lead to decrease in football achievements Air Bangis is because due to the low capacity of $VO_2\text{max}$ player itself, where the classification is being possessed by most players would not be able to meet the demands of physical conditions, especially relating to durability as a football player. $VO_2\text{max}$ is one of the most important elements that must be owned by a football player because the player is expected to play for 2x45 minutes on the pitch is large with 100-110 meters long and 64-75 meters wide, with a good $VO_2\text{max}$ have the ability then the player will be able keep the intake of oxygen in the body.

Besides being able to consume oxygen to the maximum, with $VO_2\text{max}$ high players are also able to consume oxygen quickly so that the supply of energy and the process of recovery or the recovery will be faster, "the greatest speed the use of oxygen and is a measure of the absolute greatest speed in which a person can provide energy ATP aerobic metabolism "[6].

During the training process Air Bangis football player can be said to never take measurements of $VO_2\text{max}$ capabilities so that either coach or player does not know how big its ability $VO_2\text{max}$. This led to the players and coaches can not know the major cause of declining football achievements Air Bangis last few years. By reason of these results then coaches need to give some useful physical exercise to improve $VO_2\text{max}$ / durability football player Air Bangis. "There are several methods of exercise that can be used to enhance the ability of $VO_2\text{max}$:

1) Long Duration method

This long duration method is often referred to as the continuous method the main characteristic of this method is the absence interval (intermission) during loading.

2) interval method

Interval method based on the principle interval, ie the time between (recovery interval) between the imposition of the one with the next loading

3) Methods of competition and control methods

This method is actually a method to endurance test of the required match. The use of this method is only intended to enhance and customize capabilities to endurance needed in the game.

In addition to using some of the methods presented above exercise trainer can also use methods other

exercises that can improve the durability of the players of course, with regard to the principles of exercise" [7].

V. CONCLUSION

Based on the research that has been done on football player Air Bangis, the researchers can draw conclusions in this study were mostly football player Air Bangis has the ability $VO_2\text{max}$ in the medium category with a percentage of 60%.

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