

THE EFFECT OF EXTENSIVE INTERVAL METHOD TRAINING ON THE VOMAX CAPACITY SOCCER PLAYER

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Abstract

Based on the observations in the field, it shows that the VO2Max capacity of PS. Putra Koto Mambang soccer players is still low. This is possible because less precise methods of exercise used by trainers in the training process. This study aims to see the effects of exercise interval extensive method on the VO2max capacity of PS. Putra Koto Mambang soccer player. This research method is quasi eksperimental by design one group pre test-post test design. The population of this study was 24 people, while the sample was taken by purposive sampling in order to obtain a sample of 12 players. The data was collected by conducting a test with the test instrument used was the Multistage Fitness Test (MFT) or the Bleep test. The data analysis and hypothesis testing used is the comparison analysis technique by using T-test with significance level of $\alpha=0.05$. The results of data analysis show that: extensive interval training method has a significant effect on the VO2Max capacity of PS. Putra Koto Mambang soccer players, with the obtained coefficient of t_{count} (9.36) greater than t_{table} (1.796)

Keywords: Soccer, VO2Max Capacity, Extensive Interval Method

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INTRODUCTION

The idea of the game of football is to put the ball into the opponent's goal as much as possible and defend the goal it self from being conceded. To do that a footballer must have good technique, physical, tactics. Techniques such as passing, dribbling, heading, and shooting must be mastered properly, this is used to pass opponents and scored against the opponent's goal. When performing techniques, physical elements such as agility, strength and endurance are very supportive. In addition, players must have a good mentality, when attacked by an

opponent, he must be able to hold back his emotions. If all is well collaborated, a player will be able to carry out the idea of a football game in an attempt to win the match (Okilanda et al., 2021).

Football is a very competitive sport. The competition in an event takes place with intense competition. Players face various forms of opposing characters, so the player's physical condition must be optimal. Various components of the physical condition must be controlled by football players. This is in line with what was conveyed by Gahlul and Hofmann in (Hyballa, Dost, & Poel;, 2016) Football is a competitive sport with intermittent power. It is closely related to speed, strength, coordination and endurance, meaning the ability to repeat short and very intensive efforts during a match. While (Ade, Harley, & Bradley, 2014) Football is an intermittent sport that includes short bouts with prolonged high-intensity running and low-intensity training.

Physical conditioning is one of the factors that determine achievement in sports, as well as in football. One of the important physical conditionings that a football player has is endurance. Endurance is the main element or foundation in the sport of football. A long match (2x45 minutes) will drain a lot of energy, so it requires excellent endurance. Good endurance will help players to fight during the match.

One of the indicator to see a person's endurance is VO₂Max capacity. There is a theory that VO₂Max is representative of the aerobic endurance ability of an athlete. Maximal oxygen uptake (VO₂max) is a parameter of aerobic capacity in humans. VO₂max represents the maximum level of oxygen that can be consumed at a given time (Stojkovic, Cvorovic, Jeknic, & Kukic, 2017). In football, high VO₂max and skills are needed to compete at the international level. Because, if you only have the skills or skills in managing a good ball, but do not have a high VO₂max, then these players will not be able to compete at international and professional levels (Bahtra, Asmawi, Widiastuti & Dlis, 2020)

The maximum volume of oxygen that can be consumed during continuous and gradually increasing intensive exercise, mainly using the aerobic processes. It is calculated in ml/kg/min using specific laboratory tests or field tests (Taylor, 2016). Besides that (Owen, 2016) explain that VO₂max is the maximum or optimum rate at which the heart, lungs, and muscles can be effectively use oxygen during exercise. It is used as a way of measuring a person's individual aerobic capacity. Meanwhile (Sidik, Pesurnay, & Afari, 2019) explains the amount of O₂ that is processed in the athlete's body when working or training at maximum.

The long duration and the many activities in a soccer match make the body need VO₂max maximum. A soccer match that has high mobility and lasts a long time, which is 2x45 minutes, requires a lot of VO₂Max (Bahtra, Fahrozi, & Putra, 2020). Many research results and theories explain the VO₂max needs of a football player. Findings from the data strongly indicate that the value of VO₂max 62-64 ml / kg / min to meet the demands of aerobic capacity in men's professional football (Tønnessen, Hem, Leirstein, Haugen, & Seiler, 2013). A soccer player's VO₂max is no different (professional 56,5 ml/kg/min; amateur 55,7 ml/kg/min (Wells, Edwards, Winter, Fysh, & Drust, 2012).

For each playing position, the results found that in general the VO₂ max values reported in the scientific literature varied between 48.4 and 57.5 ml / kg / min for goalkeepers, between 53.2 and 62.8 ml / kg / min. for defenders, between 54.7 and 63 ml / kg / min for midfielders, 54.5 and 62.9 ml / kg / min for forwards (Slimani, Znazen, Miarka, & Bragazzi, 2019). The average VO₂Max of a professional player is: 1) wing-back 62 ml / kg / min, 2) center-back 56 ml / kg / min, 3) midfield player 62 ml / kg / min, 4) striker 60 ml / kg / min, 5) goalkeeper 51 ml / kg / min. For semi-pro players VO₂Max average (active players): 1) wing-back: 55 kg / ml / min, 2) center-back: 55 kg / ml / min, 3) midfielder: 58 kg / ml / min, 4) striker: 54 kg / ml / min (Scheunemann, 2013)

These many needs require players to practice so that VO₂Max is in accordance with the standard needs of football players. According to (Putra et al., 2015) There are various forms of training that can be used by coaches to improve

the Vo₂max abilities of football players, including interval training (interval training), fartlek training, continuous training and small sided games. There are many methods that can be used to increase a soccer player's VO₂Max. Both the general method (without the ball) and the more specific method (using the ball). The choice of method depends on the situation and the needs of the coaches.

Based on all that, the researchers chose the interval method to increase the VO₂Max of football players. According to Letzelter in to (Syafuddin, 2011), There are three types of interval method that can be used for endurance development, namely: (a) the extensive interval method, (b) the intensive interval method, and (c) the repetition method. These three methods have their own characteristics and characteristics that differ from one method to another depending on the type of resistance to be improved / developed.

From the three existing methods, the researcher chose the extensive interval method. According to (Syafuddin, 2011) Extensive interval method is known through medium load intensity, a large amount of weight through many repetitions and partial rest". So, Extensive interval method is a method of exercise that emphasizes the medium load intensity, reps a lot, and the partial rest. In its implementation, the extensive interval method has certain characteristics. According to (RÖthig dan Grossing, 2004) The feature of the extensive interval training method is the medium intensity load, where each exercise the intensity of the load is approximately 60 - 80% of the individual's maximum performance ability. It therefore allows a relatively large volume of loads.

The purpose of this study was to determine the effect of extensive interval method training on the VO₂max capacity of football players.

METHOD

This research type of quasi experimental research with a one group pre-test-post-test design. This research was conducted at GOR Sungai Sarik, Padang Pariaman Regency. The time for the exercise was carried out for 16 meetings with a frequency of three times a week, namely Wednesdays, Fridays and Sundays. The population of this study were senior players PS. Putra Koto Mambang,

amounting to 24 people. While the sample was taken by purposive sampling in order to obtain a sample of 12 players. After determining the sample in this study, a pre-test was carried out on the sample. After that the sample was given treatment for 16 meetings. The training process carried out by the players ends with a final test (post test).

The research instrument used to measure VO₂Max in this study was used Multistage Fitness Test or bleep test (Sukadiyanto & Muluk, 2011). After the data is collected then the data is compiled, then the data is processed using the t test analysis technique with the following calculation steps: 1) Normality test using Liliefors. The normality test aims to determine whether the data obtained is normally distributed or not, 2) To see the effect of the form of exercise, the t-test is used.

RESULTS AND DISCUSSION

Based on the analysis of the pre-test data for the extensive interval method training group with a sample size of 12 people, the highest score was 50.8, the lowest score was 36.4, the average (mean) 43.32, median 43.3, mode 40, 8, and standard deviation (SD) 4.58. Furthermore, from the analysis of the final test (post test) after 16 treatments, the highest score was 52.2, the lowest score was 38.1, the average was 45.07, the median was 45.85, and the standard deviation was 4.44. For more details, the data can be seen in table 1.

Table 1. Frequency distribution of the Pre-Test and Post-Test Results for the Exercise Group with the Extensive Interval Method

| No | Interval class (ml/kg.BB/min) | <i>Pre Test</i> | <i>Post Test</i> |
|----|----------------------------------|-----------------|------------------|
| 1 | 36,40 – 39,56 | 3 | 2 |
| 2 | 39,57 – 42,73 | 2 | 3 |
| 3 | 42,74 – 45,90 | 4 | 1 |
| 4 | 45,91 – 49,07 | 2 | 4 |
| 5 | 49,08 – 52,24 | 1 | 2 |
| | Total | 12 | 12 |

Before testing the proposed hypothesis, the data analysis requirements test is conducted first, namely the normality test of each data from the variable. The data normality test of the variables was carried out using the Liliefors test. From

the results of processing the normality test data with the Liliefors test, the normality of the data distribution is obtained as in table 2.

Table 2. Summary of Data Normality Testing Results

| Data | N | Lo | Ltable | Ket |
|------------------------------------------------|----|--------|--------|--------|
| Extensive Interval Method (<i>Pre test</i>) | 12 | 0,1324 | 0,2420 | Normal |
| Extensive Interval Method (<i>Post test</i>) | 12 | 0,1186 | 0,2420 | Normal |

Table 3 explains that the player's average VO2Max has increased. From the results of the initial test (pre-test) 43.32 and the final test (post-test) 45.07. Furthermore, the results of the research hypothesis test will be displayed. Based on the comparative analysis with the mean difference test formula (t test), the result is that $t_{count} (9.36) > t_{table} (1.796)$. So, H_0 was rejected while H_a was accepted. In conclusion, extensive circuit training exercises are effective in increasing the VO2Max of soccer players.

Table 3. Summary of Hypothesis Testing Results

| Extensive Interval | Max | Min | Mean | SD | t_{hitung} | A | t_{tabel} | Results |
|--------------------|------|------|-------|------|--------------|------|-------------|-------------|
| <i>Pre Test</i> | 50,8 | 36,4 | 43,32 | 4,58 | 9,36 | 0,05 | 1,796 | Significant |
| <i>Post Test</i> | 52,2 | 38,1 | 45,07 | 4,44 | | | | |

Before the experiment is given to the sample, first a pre-test is carried out in order to obtain initial data. Based on the initial data, the selected sample was divided into two groups based on matching. Then the two groups were drawn to determine which group was given training using the extensive interval method and the continuous method. After grouping, they were given training for 16 meetings with a frequency of 3 times a week (Wednesday, Friday, and Sunday).

In the results of the post-test group, the extensive interval method on the increase in the VOMax capacity of PS. Putra Koto Mambang players from the initial test and the final test amounted to 1.75, namely from an average score of 43.32 in the pre test to 45.07 in the post test. This means that the research hypothesis states that the extensive interval method has a significant effect on the VO2Max capacity of PS players. The truth of Koto Mambang's son can be accepted. This increase was probably due to the physical adaptation of the

extensive interval method training which emphasized the number of repetitions, the number of series, and the length of time resting.

The results showed that extensive interval method training can indeed increase the VO₂Max capacity of PS. Putra Koto Mambang players, but the expected increase is not yet maximal. According to (Syafurudin, 2011) sports training has the main task, that is to develop and improve the abilities possessed by athletes both in terms of physical and mental abilities.

In this regard, training with the extensive interval method aims to increase the endurance of football players, in this case, to increase the capacity of VOMax. In an effort to increase the VO₂Max capacity, the extensive interval method is very suitable. With a lot of repetitions and a little rest, this will stimulate the work of the lungs and heart so that the oxygen uptake process will be maximized. If the oxygen taking process is good, it will have a good impact on a player's VO₂Max capacity. With this good VO₂Max capacity, it will support the achievement of the desired achievements.

So important is the need for VO₂max, soccer players need to increase their VO₂max capacity. A good VO₂max will provide its own advantages for players. There are multiple advantages in terms of building a large VO₂max, namely having the provision and creation of energy to move without limits, having a very fast recovery period so that athletes can work long hours without experiencing significant fatigue. (Sidik et al., 2019). This is confirmed by the research results (Alexander & Mier, 2011) increased VO₂max has been associated with improved performance during competition (e.g., distance covered, intensity of work, engagement with the ball)

To increase the capacity of a good VO₂Max, a player must exercise regularly and continuously. This exercise must be repeated until the VO₂Max capacity will be better too. Many say that building VO₂max is always associated with aerobic training. Several studies link aerobic exercise to VO₂max, such as (Meylan, Cronin, Oliver, & Hughes, 2010) *Soccer is an intermittent sport which requires different physiological components. The capacity to produce varied*

powerful actions during a 90-minute game is associated with high aerobic power (VO₂max). Aerobic physical exercise for 3 weeks can increase the VO₂max value (Watulingas, Rampengan, & Polii, 2013). Aerobic exercise can increase the VO₂max of untrained healthy adolescents (Mondal, 2012).

Improvements in VO₂max have been associated with improved soccer performance during competition (i.e., distance covered, average work intensity, involvement with the ball) (Alexander & Mier, 2011). The player with the highest VO₂max has a more decisive role during the match. The implication is that a player with a higher VO₂max increases their potential to influence the final outcome of a football match (Ishee & Foster, 2013). The results of these studies suggest that increasing VO₂max will make players appear better on the field. This is evidenced by the higher distance traveled during the match.

The high match tension sometimes has an impact on the psychological aspects of the players on the field. Players must be able to maintain concentration, focus and consistency during the match. Here VO₂max has a very important role, players who have a good VO₂max level are certainly able to maintain their concentration and focus during the match. On the other hand, players who have a bad VO₂max level will easily waver, not focus because they are tired, the brain cannot work optimally.

CONCLUSION

Based on the data analysis and the discussion previously described, it can be concluded that the extensive interval method training has a significant effect on the VO₂Max capacity of PS players. Putra Koto Mambang, where the results obtained $t_{count} > t_{table} = 9.36 > 1.796$.

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