

Proceedings of the 1st Progress in Social Science, Humanities and
Education Research Symposium (PSSHERS 2019)

The Effect of Playing Training Method and Circuit Training Method Towards VO₂ Max Capacity on Badminton Male Athlete at G-Sport Center Padang

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ABSTRACT

This research method is a quasi-experimental (quasi experimental). The population of this study were all male athletes from the G-Sport Center Padang badminton, while the samples were determined by passive sampling so that a sample of 24 athletes was obtained. The test used was a bleep test which aims to determine the capacity of VO₂-max of G-Sport Center Padang badminton male athletes, while the data analysis used was the t-test. The results of data analysis showed that: (1) the playing method training had a significant effect on the capacity of VO₂ max of G-Sport Center badminton male athletes with the results obtained by $t_{count} > t_{table} = 9.36 > 1.796$. (2) Circuit method exercises have a significant influence on the capacity of VO₂ max athletes with the results obtained by $t_{count} > t_{table} = 7.16 > 1.796$. (3) Playing method exercises have a more effective effect than the circuit method on increasing the capacity of VO₂ max with the results obtained by $t_{count} > t_{table} = 2.17 > 1.796$. From this study it can be concluded that the two methods can increase the capacity of VO₂ max badminton athletes from G-Sport Center Padang. Besides that, the playing method was more effective than the circuit method to increase the capacity of VO₂ max.

Keywords: *Playing training, circuit training, VO₂Max, badminton*

1. INTRODUCTION

Badminton is one of the branches of the sport that is quite popular in the world. This sport is interesting one method of physical exercise that is easy and does not require a long time is a method of training in the form of playing and the method of circuit training. Why this method of playing practice and the method of circuit training is an option, because in its implementation it can increase the motivation of athletes in carrying out motion tasks that must be completed and at the same time be able to answer all challenges and barriers to problems of lacking facilities and infrastructure through modification of sports in the form of small games exercise directed at all components of physical fitness. Modifications can be in the form of simplifying playing rules, equipment used, number of players, how to win in the game, and so on. The most important thing is that the coach must be creative, innovative, and skilled in order to achieve the achievement goals themselves.

This method of playing practice provides the widest possible space and opportunity for athletes to actively move. The task of the trainer is to

provide these opportunities through interesting, educative, varied and innovative training strategies.

In the implementation of the play training method it is very flexible, in terms of time, tools, regulations, and other requirements that can be understood and obeyed by all players. This method of playing practice always adapts to the needs of athletes who are actively growing and developing, the environment, and the daily activities of athletes. This is very important, the cause is related to the expected final results. athletes do not feel burdened with the task of motion that must be done even feel happy and there is a strong motivation to always do it.

Given the many problems that can be raised in the background of the above problems, the researchers This sport attracts various age groups, various skill levels, men and women play this sport inside or outside the room for recreation as well as a place of achievement. This badminton game is a fast game that requires good movement and reflexes and a high level of fitness. Badminton is a sport that is very popular in Indonesia.

Badminton is still growing, increasingly popular, requires agility and challenges. Badminton

sport is an indirect contact sport, because each player plays in his own field and is limited by a net or net. The principle of playing badminton is to hit the ball (shuttlecock) by using a racket into the opponent's playing field by crossing the point object (shuttlecock) passing over the net and keeping it so that the object points (shuttlecock) do not fall on the field itself. In this badminton sport, there are 4 parties that are often contested namely men's and women's singles, men's and women's doubles, mixed doubles, and team parties. To be able to play badminton properly, an athlete must have a speed of motion. Based on the observations of researchers on the ground when the Padang G-Sport Center badminton athletes took part in the exercise, the researchers saw that in the last 3 years the male G-Sport Center athletes never scored more achievements as champions in the men's singles and men's doubles, namely in 2015, 2016 and 2017 at the Padang city level championship and the West Sumatra province athletes often experience a less regular playing pattern while playing, so athletes find it difficult to regulate breathing attacks on opponents and enter shuttlecocks to the opponent's defense line,

After the researcher conducted a discussion with the trainer and looked at the problems that occurred in the field, due to lack of evaluation of the physical condition and systematic endurance so that athletes were less able to process the foot, arm and overall movement and lack of speed. In this case, the coach has done a number of exercises to develop the resilience of the athlete's physical condition while playing, but there has not been a significant improvement in the agility of the playing movement in the G-Sport Center badminton athlete in Padang. This is due to the placement of strength training programs and strength and agility that are not good which affect the quality of VO₂ max. From the description above, it can be seen that Vo₂ max levels are needed in badminton and in order to get the agility an athlete must follow various forms of training and play. VO₂ Max or the maximum capacity of oxygen is very important for badminton athletes, because athletes who have a high VO₂ max level will be able to perform competing and playing activities well and without significant fatigue, and their bodies remain fresh when they stop their activities and at rest.

VO₂ max athlete from G-Sport Center badminton man in Padang? 2). Is the method of circuit training influential to increase VO₂ max badminton athletes of G-Sport Center Padang? 3). Is there a difference in influence between the method of playing practice and the method of

circuit training on increasing VO₂ max athletes from the male badminton G-Sport Center in Padang? The problem in this study is important to study in the hope that it can provide benefits including: Theoretically; Enriching the knowledge and technology of sports, especially on VO₂ max in order to increase the motivation of athletes to carry out physical exercise activities. Practically; For athletes, through playing methods and circuit training methods athletes can understand the nature of the donations given from the training process to improve quality when competing. For trainers, through playing practice and circuit training the process will be more effective in increasing athletes in a pleasant atmosphere, they will be more interested in taking physical exercise so that the training process will get better. For club institutions, through playing practice methods and circuit training methods can improve the quality of training in a club, so that it has an impact on the quality of achievement. Donations to the world of badminton championships to junior athletes that important VO₂ max issues are given more attention to create a qualified next generation so that they can compete competitively on a global level. For researchers themselves, they can add knowledge and insight into this study as well as one of the requirements in obtaining a Masters degree in Physical Education in S2 Sports Education Study Program, Faculty of Sport Sciences, Padang State University. For other researchers, it can be a reference in developing broader and better for similar research

2. METHOD

This research is an experimental research to reveal the symptoms and effects of variables whose analysis results are presented in the form of descriptions using statistical figures. Therefore the approach used is a quantitative approach. In accordance with the opinion of Sukadyanto (2005) that "quantitative research displays the analysis of statistical data that is presented with numbers and aims to test the hypothesis that has been set."

The research method used in this study is the Quasi Experiment method. The use of this method is adjusted to the purpose of the research, which is to find out the results tested so that the causal relationship between the groups with one another will answer the research problem proposed. Arikunto (2007) argues about "the experimental method is to know whether there is a result of something that is imposed on the subject inquired. In other words, experimental research tries to examine whether there is a causal relationship".

Experiments are always intended to see the consequences of a treatment.

Based on the above opinion, this is in line with the problem of researchers wanting to know the cause and effect of a playing training method and circuit training method on increasing VO2 max athletes. The variables in this study consisted of two independent variables (independent variables), namely the playing training method and the circuit training method. While the dependent variable (dependent variable) in this study is VO2 max.

Based on the description of the research methods above, the researchers used the experimental method, using the Two Groups Pre Test - Post Test Design research design. Pre Test is a design that is said to have not been a real experiment because there are still external variables that have an influence on the formation of the dependent variable, this design is useful for getting initial information about the questions in the study. Post Test is a design that has two groups, each of which is chosen by random (R). The first group was given treatment (X) and the other group did not. The treated group is called the experimental group and the non-treated group is called the control group. In the Post test design there were two groups randomly selected, then given the Pre Test to find out the initial state of the sample before being treated.

3. RESULTS

The research process was carried out for 18 meetings, with details of one meeting for the initial test, 16 meetings for treatment (treatment) for the sample with training times 4 times a week, and one meeting for the final test.

The results of the study will be described according to the objectives of the hypothesis proposed previously. Based on the analysis of the initial test data (pre test) training group playing method with a sample of 12 people obtained the highest score of 50.8, the lowest score of 36.4, the average (mean) 43.32, median 43.3, mode 40.8, and standard deviation (SD) 4.58. Furthermore, from the final test analysis (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. can be seen the results of the initial test data (pre test) playing method training group turned out to get the VO2 Max capacity score with interval classes 36.40 - 39.56 as many as 3 people, 39.57 - 42.73 as many as 2 people, 42.74 - 45.90 as many as 4 people, 45.91 - 49.07 as many as 2 people, and in the interval class 49.08 - 52.24 as many as 1

person. Then in the post test results that obtained VO2 Max capacity scores with interval classes 36.40 - 39.56 as many as 2 people, 39.57 - 42.73 as many as 3 people, 42.74 - 45.90 as many as 1 person, 45.91 - 49.07 as many as 4 people, and in the interval class 49.08 - 52.24 as many as 2 people

From the classification of the data displayed, it appears that there is indeed an increase in the capacity of VO2 Max athletes. This can be seen in the post test results where each interval class has increased from the pre test results. In addition, based on calculation data per individual athlete, it shows that the VO2 Max capacity of each athlete has increased. This increase is very significant based on the interval class

Based on the analysis of the final test data (post test) training group playing method with a sample of 12 people obtained the highest score of 52.2, the lowest score of 38.1, an average of 45.07, the median of 45.85 and the standard deviation of 4.44. While the post test analysis of the circuit training group after giving treatment for 16 meetings got the highest score of 51.6, the lowest score was 38.5, the average was 44.48, the median was 44.2 and the standard deviation was 4.33

The results of the preliminary test (post test) data of the play method training group that obtained VO2 Max capacity scores with interval classes 38.10 - 40.92 as many as 3 people, 40.93 - 43.75 as many as 2 people, 43.76 - 46.58 as many as 2 people, interval classes 46.59 - 49.41 there are no athletes who get it, and in the interval class 46.59 - 49.41 as many as 3 people, and in the interval class 49.42 - 52.24 as many as 2 people. Then in the final test results (post test) the circuit training group that obtained VO2 Max capacity scores with interval classes 38.10 - 40.92 as many as 3 people, 46.59 - 49.41 as many as 3 people, 43.76 - 46.58 as many as 2 people, 46.59 - 49.41 as many as 2 people and in the interval class 49.42 - 52.24 as many as 2 people.

From the classification of the data displayed, there is a difference between the method of playing with the circuit method. The difference is seen in the interval class of 40.93 - 43.75, where in the play method there are 2 people while in the circuit method there are 3 people.

In addition, in the interval class 46.59 - 49.41, the interval group was extensive, 3 people and the circuit group was 2 people. However, based on calculation data per individual athlete, it shows that the VO2 Max capacity of each athlete has experienced a different increase. This difference can be seen from the average increase in each sample group, in the play method group the average is 1.75, while in the circuit method group

the average is 1.18. This difference shows that even though treated equally, but not all samples will give the same response to the treatment given. The same response to the treatment given.

The research hypothesis was tested using t test analysis. Before the t-test analysis is carried out, the normality test and homogeneity test are conducted to find out whether the data is homogeneous and comes from a population that is normally distributed or not.

The post test data normality test was analyzed by Lilliefors test statistics. The test results for the exercise group pre test data playing methods are 0.1324 and L_{table} 0.2420, with $\alpha > 0.05$, it can be concluded that the data are normally distributed. The test results for the pre test data for the training group circuit method are 0.1468 and L_{table} 0.2420, with $\alpha = 0.05$, it can be concluded that the data is normally distributed. The results of the post test data testing for the exercise group playing method are 0.1186 and L_{table} 0.2420, with $\alpha > 0.05$, it can be concluded that the data are normally distributed. The results of post test data testing for the training group circuit method are 0.1348 and L_{table} 0.2420, with $\alpha > 0.05$, it can be concluded that the data are normally distributed.

Based on the description above all data variables are normally distributed. Based on the criteria if the observation (L_o) is smaller or equal to L_{table} (L_t) means that population data is normally distributed, conversely if the observation (L_o) is greater than L_{table} (L_t) means population data is abnormally distributed, because each probability variable meets the criteria $L_o < L_{table}$. It can be said that each data is spread normally or the population of the sample data is normally distributed.

After the analysis of the requirements test is carried out and it turns out that all data for each research variable meet the requirements for further statistical testing, then the hypothesis testing is then carried out. In this study there are three research hypotheses, namely: (1) Play method has a significant influence on the capacity of VO2 Max Padang G-Sport Center athletes. (2) The circuit method has a significant influence on the capacity of VO2 Max Padang G-Sport Center athletes. (3) The method of playing is more effective than the circuit method in increasing the capacity of VO2 Max Padang G-Sport Center athletes.

4. DISCUSSION

Seeing the problem in the G-Sport Center athletes in Padang, namely the low capacity of VO2 Max, it is necessary to do exercises to increase the capacity

of VO2 Max. In this case the training given is to use the playing method and the circuit method. From the use of these two exercises, it will be seen whether there is an influence on the capacity of VO2 Max Padang G-Sport Center athletes.

Before the experiment is given to the sample, the initial test (pre test) is used to obtain the initial data. Based on the preliminary data, the selected samples were divided into two groups with many according to matching. Then the two groups were drawn to determine which groups were given training using the play method and the circuit method. After grouping there are more than 16 meetings with a frequency of 3 times a week (Wednesday, Friday and Sunday).

To get more accurate data, it is necessary to study the methodology and study the theory that supports a study. By using the knowledge obtained through a scientific approach and made based on certain theories and carried out in a systematic method with the right steps and producers, it is expected that the results of this study can be accepted the truth.

5. CONCLUSION

Based on the Data Analysis and discussion that has been described previously, then some conclusions can be stated as follows; 1). Play method training has a significant influence on the capacity of VO2 Max badminton athletes at G-Sport Center Padang, where the results obtained by $t_{count} > t_{table} = 9.36 > 1.796$. 2). Circuit method exercises have a significant influence on the capacity of VO2 Max badminton athletes at G-Sport Center Padang, where the results obtained by $t_{count} > t_{table} = 7.16 > 1.796$. 3). The playing method is more effective than the circuit method to increase the capacity of VO2 Max badminton athletes from G-Sport Center Padang, where the results obtained by $t_{count} > t_{table} = 2.17 > 1.796$.

Based on the results of studies that have found that the approach to playing methods and circuit methods can increase VO2 Max's capacity. This means that both of these methods can be used for training in increasing VO2 Max's capacity.

The results of this study are quite interesting to put forward, because from the results of this study it was found that the playing method was superior to the circuit method. Although in general these two approaches have an influence on increasing VO2 Max capacity, if applied to athletes it turns out that playing exercises are more effective than the circuit method for increasing VO2 Max capacity. This can be expressed based on the results of the research that I found, where the final results show that the playing method is superior to

the circuit method for increasing VO₂ Max capacity.

The first implication of the researchers' findings is that the Padang G-Sport Center badminton coach expected that in increasing the VO₂ Max capacity the exercise with the playing method was a better method to use when compared with the circuit method to increase VO₂ Max's capacity. This is due to the fact that the exercise with the playing method has a moderate burden and a recovery period so it is not too burdensome for athletes. Apart from that in badminton games a good VO₂ Max capacity is needed so that athletes are able to run matches well and without experiencing significant fatigue.

Implications of the two research findings have an impact on the G-Sport Center badminton athletes in Padang to take part in the training to prefer the method of playing. Motivation of athletes to take part in training is higher, so that the results of the training they get are also better. Enthusiastic athletes follow the practice approach to playing in training to increase VO₂ Max's capacity. This motivation can be given by the trainer through an approach to the athlete or information about the benefits of a good VO₂ Max capacity so that athletes are motivated to increase VO₂ Max's capacity.

In this case the circuit training approach is not simply ignored, because even though the results in this study also found an increase in the capacity of VO₂ Max using the circuit method. In addition, the circuit method can also familiarize athletes with a lot like in badminton games.

The two methods of approach above are arranged on the basis of the similarity of movements for each form, especially in training activities. The difference in the success of the increase in VO₂ Max capacity between the playing method and the overall circuit method shows that the method of playing training is better than the circuit training. Judging from the calculation of the average number obtained and the significance of the differences between the two forms of the above approaches to the capacity of VO₂ Max badminton athletes G-Sport Center Padang.

It can be concluded from the results of this study that the form of exercise playing method is better to be used in increasing the capacity of the G-Sport Center badminton VO₂ Max athletes compared to the circuit method. But the opposite can happen if this approach method is used in other studies, other sports and with different samples.

In accordance with the conclusions of the research results, some suggestions can be put forward as follows:

To the G-Sport Center Padang badminton coach, it is recommended to use the playing method when providing endurance training.

The Padang G-Sport Center badminton athlete who wants to increase VO₂ Max's capacity is recommended to use the playing method in training physical conditions.

This research is limited to badminton athletes, therefore for the next researchers to be able to develop this research in other badminton clubs that have more or more samples.

Table 1. Summary of Data Normality Test Results.

Data	N	Lo	L _{tabel}	informa tion
Extensive Play Method (Pre Test)	12	0,1324	0,2420	Normal
Extensive Circuit Method (Pre Test)	12	0,1468	0,2420	Normal
Extensive Play Method (Post Test)	12	0,1186	0,2420	Normal
Extensive Circuit Method (Post Test)	12	0,1348	0,2420	Normal

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