Tabata Training for Increasing Aerobic Capacity

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Abstract. Futsal is a ball game with speed so that each player is required to have the excellent physical condition. One of the components necessary physical condition of players as the early foundation is endurance (aerobic). There are several training patterns that can be used in improving aerobic capacity. One that has not been widely adopted was the Tabata training. The purpose of this study was to determine whether the application of Tabata training provides a significant effect on aerobic capacity. The method used is the experimental method. The participants in this study was an 18 female student of futsal activity unit of UPI who selected as the team's needs. The sampling technique used the purposive sampling technique. Bleep test was conducted to measure aerobic capacity. The results show that the average of VO_2max score of the pre-test and post-test was 37.7 mL/(kg·min) and 40.5 mL/(kg·min). Thus, there is significant influence Tabata training to increase aerobic capacity.

1. Introduction

In the period of last 16 years, Indonesia's sports achievement is very alarming, because with the big population is not able to find a proportional number of athletes. Based on the identification of this achievement appears more problems caused by internal as well as external factors, both technical and non-technical.

The weakness that occurs in the achievement of the national elite athletes is caused by the many coaches who have not been able to optimize the potential of athletes due to limited knowledge of sports training especially physical training [1].

Based on the observations of researchers about the condition of the current achievements that are happening in the world of sporting achievement is less or not maximal application of sports science underlying coach coaching process. As the science of coaching, the sport has yet to be maximized application by the coaches at the national level. Much research has strived to boost athletic performance.

The reality on the ground interviews with coaches Prima Pratama. Among them:

1. Weak understanding of the science of coaching
2. Weak understanding of the physical condition
3. Weak training needs analysis.
4. Unqualified to make the exercise program

The physical condition is one aspect that must be considered in achieving a feat, one of the components that affect the appearance of the athlete is physical. Physical condition is a prerequisite indispensable in improving the achievement of an athlete, can even be regarded as a basic necessity that cannot be postponed or negotiable [2].

One of the components necessary physical condition of athletes as the early foundation is durability. Durability is the basic capital that is required to support aspects of other skills. Endurance is the ability of the body to work role in the long term. Endurance is the ability to resist fatigue. In addition, endurance is a state or condition of the body that is able to work in a long time, without experiencing excessive fatigue after completing the job. The meaning here is the durability of circulatory-respiratory endurance, or cardiovascular endurance (circulatory, respiratory breathing, cardiac cardio comes from the word that means the heart) [3].

Endurance is the basis for an athlete futsal because with great endurance athlete can play futsal with long lead times and performance (appearance) which was nice. Many methods and forms of exercise that can be used to improve the physical condition of the athletes especially the physical endurance of an athlete, one of the Tabata training method.

Tabata training is a training method introduced by Prof. Izumi Tabata in 1996, he concluded that the method can improve physical ability, aerobic, and anaerobic. Basically, Tabata training method is a method of HIIT workout or interval training with high intensity. Meanwhile, the execution was Tabata training method takes four minutes with eight intervals. Each interval takes 20 seconds with high intensity. Physical exercise at a high intensity for 20 seconds and then rest 10 seconds. Repeat this pattern until eight times with a total time of four minutes [4].

The benefit of Tabata training is burning body fat, increase metabolism during exercise, increase metabolism after exercise, practice fast and time is short, increasing the aerobic system, this method is the study of coaches' athletes Olympic, improve mental toughness and strength, the method is versatile, you can choose from various activities [5].

Tabata training is relatively rare in physical training in Indonesia caused by several things, like some coaches who do not understand the benefits of this training, doubts about the implementation of this training, and the variations of these exercises Tabata training method. The other thing that is a problem in the practice of the exercise is the application of training methods that are still the unclear character of each of these methods. Understand the limitations of the method is part of the limitations of the coach in the training process.

Therefore, researchers felt compelled to examine more deeply about Tabata training method designed varied and in this case, the researchers would be more specification to the impact of Tabata training method to increase aerobic capacity.

2. Method

The method used is the experimental method. The population in this study is a student activity unit futsal daughter UPI total of 32 people and the samples taken as many as 18 people were selected as the team's needs. The sampling technique used the purposive sampling technique. Collecting data using tests (bleep test) to measure endurance. Statistical Calculations using the equality test two averages.

3. Results and Discussion

Data obtained from the tests are still in the form of raw data that must be in though and analyzed statistically. The results of calculating the value of the average initial tests and standard deviation 37.7 preliminary tests 6.4 and the average value of 40.5 and a final test final test standard deviation of 4.8. After that the data normality test, the data were normally distributed subsequently testing the equality of two average to determine whether there is a significant increase in results of the exercise of the sample group to increase *aerobic* capacity.

The score of the t-test = 3.37 with t-table at significance level α = 12:05 by dk (n-1) = 17, t = (1- α) = (1- 0.025) = 0.975 is 2.11. From the results of the above data can be concluded that H rejected means H_1 received. Thus Tabata training can significantly improve aerobic capacity.

Table 1. Results and Significance Improved Results

t-count	t-table (0975)	significance
3.37	2:11	Significant

The results of data analysis and processing, the result of changes increase the ability of the physical components endurance visible change in the average value obtained from pretests (37.7 mL/(kg.min)) and posttest 40.5 (mL/(kg.min)) it shows that the application of training Tabata significantly improves aerobic capacity. This result is supported by Rich (2014) that stated that the Tabata method burn fat, increase metabolism during exercise, increase metabolism after exercise, practice fast and time is short, increasing the aerobic system, this method is the study of coaches' athletes Olympic, improve mental toughness and strength, the method is versatile, you can choose from various activities [5,6].

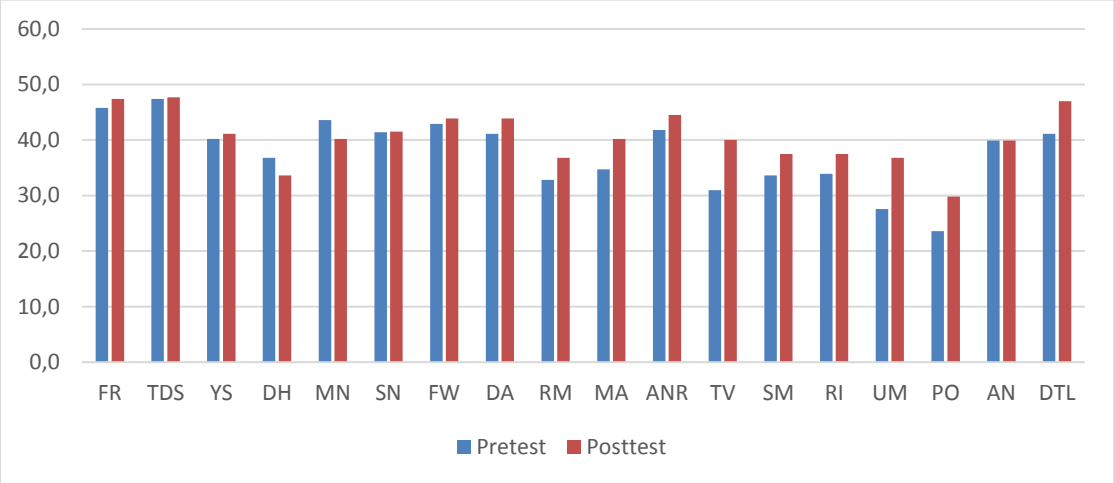

Figure 1. aerobic capacity score of pretest and posttest

It is clear in the figure 1 that aerobic capacity is increasing significantly, there are even quite dramatically increase sample, one factors that influence it, namely the presence and in the training process. However, there are two people who have seen the decline of the pretest and posttest scores. The possibility of the decline was caused by several factors, including fatigue before making a posttest or do less than the maximum resulting in decreased aerobic capacity.

4. Conclusion

Based on the results that aerobic capacity is increasing significantly from pretest (before Tabata training) to posttest (after Tabata training). Meaning that there is significant influence *Tabata* training to increase aerobic capacity. It can be concluded that Tabata training increase *aerobic* capacity (experimental study on female student of futsal activity unit of UPI Bandung).

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