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THE EFFECT OF INTERVAL TRAINING ON THE INCREASE OF VO2MAX IN TAEKWONDO ATHLETES

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Abstract

The problem in this study is that interval training is rarely used in the physical training of taekwondo athletes Dojang Kodim 03/04 Agam, Bukittinggi And the researcher wants to investigate the extent to which athletes' lack of understanding of interval training can affect their ability to increase Vo2Max, where physical conditions greatly affect the athlete's performance. Therefore, the researcher is interested in understanding the effect of interval training on the Increase of Vo2Max of Taekwondo Athletes Dojang Kodim 03/04 Agam, Bukittinggi. This study uses a pseudo-experiment method which means that the researcher cannot fully control the sample with the One Group Pretest Posttest Design. The population in this study is 162 athletes, consisting of 72 women and 90 men, and the sampling technique, Purposive sampling is a sample determination technique with certain considerations, including the age range of 13-16 years and the male gender, so the number of samples in this study is 15 people. The instrument is in the form of the MFT (Multi Fitness Test) Bleep Test. The analysis technique used a t-test with a level of $\alpha = 0.05$. Based on the results of the study, the tcal value of 8,449 > the table was 1,761, so there was a significant influence. Therefore, it can be concluded that there is an effect of interval training on the increase of Vo2Max of Taekwondo Athletes Dojang Kodim 03/04 Agam, Bukittinggi.

1. Introduction

Sport is an activity that makes the body healthy and a means of competence to find one's talent in sports (Ibeng, 2021). In the next development, sports are not as a means to stabilize or maintain health, but for a competency event that is able to make the name of the group or country fragrant (Akbar & Rizki,2021).

A flow or training journey is an important role and task in achieving sports achievements. The preparation of the periodization of exercise programs, especially the physical exercise aspect, must be planned carefully, and carried out systematically which functions to improve physical fitness and the functional capacity of the body so that it can support muscle performance to be more to the maximum. The ability to physically condition is an element that plays an important role in becoming the foundation in developing and improving technical skills, the application of tactics and strategies and the mentality of athletes (Mubarok&Mudzakir,2020).

According to (Oktavianus, 2018:22) "Athletes who have excellent physical conditions will find it easier to master technical techniques in the sports they master. Because for tactical training, techniques and other skills will be implemented optimally. Therefore, even if it is because of this, in the training program, physical condition must be arranged, arranged and implemented very well so that it can improve physical fitness and biometric abilities.

Physical condition training is a series of systematic physiological training, which is carried out repeatedly and progressively and is carried out to improve work efficiency and maintain body condition. Exercise programs that must follow periodizations that have been designed and planned based on sports, so that the athlete's energy and muscular systems can adapt to the specificities of sports. Exercise is a measurable activity and is carried out repeatedly with an increasing exercise load or called progressive which has the ultimate goal of improving movement impaired in a way that organizes a good training system that functions to improve sports performance (Mubarok, 2021). Achievement sports are activities that are carried out professionally with the aim of obtaining maximum performance in certain sports (Ma'sum R et al. 2020). Endurance is divided into two, according to (Sukadliyanto, 2011:60) the definition of endurance is reviewed from muscle performance is the ability to work muscles or many otlots in a certain period of time, while the definition of endurance from the energy system is the ability to work organs of the body in a certain period of time. There are several factors that can affect endurance, one of which is Vo2 Max.

Kharisma & Mubarok (2020) explained that Vo2Max is a factor that affects the ability of an athlete or someone who does sports continuously. Vo2max capacity is always associated with increased activity with the level of fatigue then the fatigue level is low, the Vo2 Max capacity is the amount of cell metabolism and is used for energy in its own right. The capacity of Vo2 Max is an indicator of the amount of synthetic capacity of a person's aerobic energy storage. Vo2 Max is not only for measuring the level of physical ability to hold oxygen, but also to give it to working muscles and help with metabolic elimination and not only that, Vo2Max is also to support performance (Salman, 2018).

Vo2 Max is a single prediction of cardiorespiratory physical freshness or an estimate of the exercise capacity of a partner that has a protective effect in cardiovascular disease (Jung Kang, 2019:1). Effective interval training can have a good effect on eliminating body fat and also improve physical fitness compared to moderate-intensity training (Li, 2022:250). Taekwondo Dojang Kodim 03/04 Agam forgets that it is part of the integrated sports achievement development system through a combination of achievement coaching in the general field. At this time, the team is preparing for several match events that will be held in mid-2024 both at the provincial, national and even international levels. Based on and also a researcher interview in December 2023 with the coach, the interval training method is rarely used for athletes, usually for aerobic endurance training, athletes often use the 100-meter sprint running method and techniques that are classified as monotonous. The physical condition tests that have been carried out include Endurance, Speed and Egality with a medium average score.

2. Materials and Methods

This type of research is research with pseudo-experiments, which according to Sugiyono (2015: 114) is a research that is close to real experiments. This study aims to directly test the influence of one of the variables on other bound variables and test the hypothesis of the be cause and effect relationship, the independent variable in this study is Interval Exercise, and the bound variable is Vo2Max. The number of samples in this study is 15 people. The design of this study is to use one group with a pretest design, which consists of one group.

3. Results

a. Results of pre test and post test bleep test athletes

Table 2. Vo2Max Pre test Frequency Distribution.

NO	*Pre-test*		
	Categori	**Sum**	**Percentase**
1	Bad	0	0%
2	Not Good	0	0%
3	Pretty Good	11	73%
4	Good	3	20%
5	Very Good	1	7%
	Total	15	100%

Based on the distribution data of the frequency of pre-test taekwondo athletes of the Kodim 03/04 Agam, Bukitinggi shows that the majority of VO2Max athletes are in the fairly good category of 11 people (73%), in the good category as many as 3 people (20%), and in the very good category only 1 person (7%).

Table 3. Vo2Max Post Test Frequency Distribution

No	*Post-test*		
	Categori	**Sum**	**Percentase**
1	Bad	0	0%
2	Not Good	0	0%
3	Pretty Good	5	33%
4	Good	6	40%
5	Very Good	4	27%
	Total	15	100%

Based on the data on the frequency distribution of post-test frequencies of taekwondo athletes of the 03/04 Agam Military Command Headquarters, Bukittinggi shows that the majority of VO2Max athletes are in the good category as many as 6 people (40%), in the fairly good category as many as 5 people (33%), and in the very good category as many as 4 people (27%).

2. **Normality Test**

The normality test aims to find out whether the data is distributed normally or not. Normality testing of the effect of interval training on VO2 Max of taekwondo athletes dojang kodim 03/04 agam, buklittinggi using Shapiro Wilk because the number of samples is less than 50. The level of significance used as a basis for rejecting or accepting the decision of whether or not a data distribution is normal or not is 0.05. The results of the normality test can be seen in the following table:

Table 4. Pre test and post test data normality

No	Variable	N	Mean	Signifikansi	distribusi
1	*Pre-test*	15	43.73	0,137	Normal
2	*Post-test*	15	46.89	0,82	Normal

From the results of the data above, it shows that the pre test has a significance level of > 0.05 which is 0.137 and the post test has a significance level of > 0.05 which is 0.824. The meaning is that the pre test and post test data for the normality test using Shapiro Wilk is distributed "Normal.

3. Uji Hypothesis

The hypothesis proposed by adalalh is that there is an effect of interval training on the increase in vo2max of taekwondo athletes in the Dojang Kodim 03/04 Agam, Bukittinggi which is tested using the t-test. The results of the hypothesis test are as follows:

Table 5. Hypothesis Detection Results

Variable		N	T Count	T table	Information
VO2Max capability	*Pretest*	15	8,449	1,761	Signifikan
	Posttest				

From the data obtained above, there are 8,449 calculations. While the table is n-1=15-1=14, using a significance level of 0.05 the ttable is obtained as 1.761. If the tcalcul>ttable then Ho is rejected and Ha is accepted, meaning that the data obtained shows a significant influence. From the results of the data obtained, namely tcount 8,449>1,761, it means that significant pre test and post test data were obtained on the increase in vo2max of taekwondo athletes dojang Kodim 03/04 Agam, Bukittinggi.

4. Discussion

Based on the results of the research that has been conducted, a tcal value of 8.449 with a ttable of 1.761 was obtained. This shows that the tcount is much larger than the ttable (8,449 > 1,761), so it can be concluded that there is a significant influence of interval training on the increase in VO_2max of Taekwondo athletes at Dojang Kodim 03/04 Agam, Bukittinggi. Interval training is a training method that consists of a period of high-intensity work interspersed with periods of rest or light intensity. This method has been scientifically proven to be able to increase aerobic capacity and endurance, including VO_2max, which is a key indicator of an athlete's cardiorespiratory capacity. This increase in VO_2max is very important in Taekwondo which demands a combination of strength, speed, and endurance during the match.

With the results of this study, the trainer or sabeum at Dojang Kodim 03/04 Agam, Bukittinggi is advised to integrate interval training programs in a structured and sustainable manner in the athlete's training routine. This aims to enable athletes to achieve more optimal physical performance, especially in the aspect of cardiovascular endurance which plays a very important role in the match. In addition, the application of interval training also needs to be adjusted to the physical condition of each athlete so that the training program can run effectively and safely. Periodic evaluation of the development of VO_2max is also important to assess the extent of the effectiveness of the exercise program implemented. Interval training is a method of exercise that involves alternating between periods of high-intensity activity and recovery periods. This method has been shown to be effective in increasing aerobic capacity, especially VO_2max, which is the maximum amount of oxygen the body can use during intensive activity. According to Buchheit & Laursen (2013), High-Intensity Interval Training (HIIT) can increase VO_2max faster and more efficiently than conventional training. This is because the exercise stimulates the cardiovascular system and muscle metabolism to the maximum.

Increasing VO_2max is very important for Taekwondo athletes because this sport requires good heart-lung endurance to maintain attack intensity and defense during the match. Other studies have also shown that interval training can improve the efficiency of oxygen use, increase the volume of the heart (stroke volume), and improve muscle adaptation to intensive exercise (Midgley et al., 2006). Thus, the results of this study are a strong basis for trainers or sabeum at Dojang Kodim 03/04 Agam, Bukittinggi to implement interval training programs systematically. It is hoped that through this program, the VO_2max of athletes will increase, so that their physical performance will also be better and more competitive.

However, the implementation of interval training must still pay attention to the physical condition of

each athlete, as well as periodic supervision and evaluation to ensure the effectiveness and safety of the exercise. With a structured approach, interval training not only improves performance, but can also minimize the risk of injury and excessive fatigue.

5. Conclusion

Based on the results of the research carried out, it can be concluded that there is an effect of interval training to increase vo2max of taekwondo athletes in the 03/04 Kodim 03/04 Agam, Bukittinggi with a thiung result of 8,449/ttabl=1,761. Given that interval training has been proven to significantly increase athletes' vo2max, the researcher suggested to the coach or sabeum dojang Kodim 03/04 Agam, Bukittinggi to apply an interval training program to athletes so that athletes' vo2max increases to be even better.

Declaration of Competing Interest

There is no conflict of interest in the implementation of this research

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