Overview of West Sumatra's Fencing Athlete's VO2 Max Level

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Abstract. The study was based on the problem, namely; the low achievement fencing athlete West Sumatra, since each championship, either national championships as well as PON, has never gained a gold medal. Low achievement athlete fencing West Sumatra is thought to be caused by many factors, such as infrastructure and facilities that are used for training, exercise programs are given coaches, quality coaches, the frequency of the championship, the mastery of the technique, the quality of the physical, mental, fitness level, and nutritional status. The purpose of this study was to determine the level of fencing athlete's VO2 max West Sumatra. This research is a descriptive. The study population consisted of fencing athlete West Sumatra were being prepared following the National Championships/Pre-PON in 2015 which amounted to 14 people. Because of the limited number of the population, then all the population sampled (total sampling). The instrument used to collect the data VO2 max using bleep test. The data analysis using descriptive statistics with frequency tabulation. Based on the analysis of data obtained by the athletes VO2 max level overview of West Sumatra as follows; Of the 14 athletes were measured, the level of VO2 max either absolutely no (0%), the level of VO2 max well as 2 (14:29%), the level of VO2 max quite as many as 5 people (35.71%), the level of VO2 max less category as much as 6 people (42.86%) and the rate of VO2 max least once as a category 1 (7:14%). Score the highest VO2 max of 45.2 ml/kg. BB/mnt, and VO2 max scores low of 23.6 ml/kg. BB/mnt. It can be concluded that of the 14 athletes fencing West Sumatra that measured their VO2 max is in the category of less as many as 6 people (42.86%).

Keywords: VO_2 Max · Athlete · Fencing

1 Introduction

Sports activities are the most important part of physical human development. In sports, there are various aspects that can shape a complete human being and will improve their health and physical fitness so that they can realize quality, advanced and independent human resources and raise the dignity of the nation. This is in accordance with the national sporting objectives stated in the RI Law no. 3 of 2005 concerning the National Sports System which states that national sports are aimed at maintaining and improving health and fitness, achievement, quality, sportsmanship, discipline, strengthening and

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fostering national unity and integrity, strengthening national resilience, and elevating the nation's dignity and honor [1].

Based on the quote above, it is necessary to instill a sense of love for exercise in everyone so that they are able to carry out physical activities to maintain and improve physical health in addition to achieving achievements [2]. As a result of long and strenuous activities, if it is not supported by good physiological requirements including heart function, blood circulation, respiration and muscles, then a person will quickly experience fatigue, one source of which comes from the respiratory system (lungs).

Sports achievements must be fostered better. Currently, the government is actively building achievement sports with various efforts, this is as stated in the RI Law No. 3 of 2005 concerning the National Sports System in Chapter VII article 27 paragraph 1 which reads: Coaching and development of achievement sports is carried out and directed to achieve sports achievements at regional, national and international levels.

Through sports too, a person will develop their abilities, to achieve maximum performance, as stated in the Law of the Republic of Indonesia No. 3 of 2005 concerning the National Sports System article 1 point 13: sports achievements are sports that foster and develop athletes in a planned, tiered and sustainable way through competitions to achieve achievements with the support of sports science and technology.

Based on the quote above, it is clear that achievement sport is a vehicle to channel one's potential that can be used as an achievement event. To achieve high performance, athletes need to be nurtured and developed in a planned, tiered and continuous manner with the help of science and technology. Likewise with the sport of fencing, which is one of the sporting achievements that is officially competed at the regional, national and international levels. Fencing is an individual sport that requires physical readiness, both anaerobic endurance and aerobic endurance.

In West Sumatra, fencing has been known for a long time, has been competed in Porprov events, has participated in national events such as the national championship, as well as multi-event championships such as PON. The achievements of West Sumatra's fencing athletes should have been seen because they have been nurtured for a long time by experienced coaches. However, based on the researcher's interview with the trainers and administrators of the West Sumatran fencing branch, it turns out that their achievement is still low, because let alone getting a medal, it is already difficult to advance to the semi-finals.

The level of a person's endurance will be influenced by the level of a person's VO2 Max. VO2 Max is the maximum oxygen volume, also known as aerobic capacity, which is the body's ability to consume oxygen maximally per minute. VO2 Max is supported by the ability of the lungs as an organ that provides oxygen, quality blood (hemoglobin) which will bind and carry oxygen throughout the body. The heart as an organ that pumps blood throughout the body, blood vessels (circulation) that will distribute blood throughout the body and skeletal muscle as one of the organs of the body that will use oxygen for the oxidation process of foodstuffs, thus producing energy [3].

Based on the description above, it is suspected that the athlete's low aerobic endurance ability is caused by their low VO2 max level, so that it affects their physical ability and ultimately affects their performance [4]. Their low VO2 max level is thought to be caused by many factors including; low levels of nutrition, motivation to practice

and compete is still low, the economic background of parents, the area and environment where the athlete lives, lifestyle and pattern, low level of physical freshness and so on.

Based on some of these possible causes, the researcher is interested in knowing more about the VO2 max level of the West Sumatran fencer, because the results of this study are expected to ensure the athlete's VO2 max condition, so that it can be used as input, especially for coaches to design future training programs. in order to increase the athlete's VO2 max, so that they can perform optimally in every competition.

2 Methods

This type of research is descriptive, which aims to reveal something as it is. As stated, descriptive research is research that does not intend to test certain hypotheses, but only describes what it is about certain variables, symptoms or circumstances [5]. In this study, researchers wanted to reveal how the level of VO2 max possessed by fencers in West Sumatra. This research, especially with regard to VO2 max data collection for athletes, was carried out in front of the KONI multi-purpose building, West Sumatra Province, GOR H. Agus Salim Padang Complex. This research was conducted on July 26, 2015.

The population in this study was West Sumatran fencing athletes (IKASI) who were being prepared to take part in the 2015 National/Pre-PON Championships, consisting of 9 male athletes and 2 female athletes. Given the relatively small population, the entire population of 14 people was used as a sample. Sampling technique is done by total sampling technique.

The types of data in this study are primary data and secondary data. Primary data is data taken directly without intermediaries from a sample of West Sumatran Fencing Athletes in the form of the athlete's VO2 max level. While secondary data is data taken from the fencing coach itself in the form of bi data athletes. The instrument used to measure the VO2 max level possessed by athletes in this study is the Bleep test or Multi Stage Fitness Test (MSFT).

3 Results and Discussion

The measured VO2 max level of the athlete, the highest score of 45. 2 ml/Kg. BW/min, lowest score 23.6 ml/Kg. BW/min, and the average score is 35.5 ml/Kg. BB/min. Furthermore, if it is related to the VO2 max level category, then from the 14 athletes measured, for the very good category there are none, the good category is 2, the sufficient category is 5 people, the less category is 6 people and the very poor category is 1 person. For more details can be seen in Table 1.

Based on the Table 1, it can be explained that; Of the 14 athletes whose VO2 max level was measured, for the very good category there were none (0%), the good category was 2 people (14.29%), the sufficient category was 5 people (35.71%), the less category was 6 people (42.86%), while the less category is 1 person (7.14%). For more details, see the histogram Fig. 1.

As explained in chapter III, that data analysis was carried out using descriptive statistics, before the data was analyzed using descriptive statistics, the data was first entered into categories (test standardization norms), this aimed to see the athlete's VO2

Table 1. VO2 max Test Frequency Distribution with Bleep test West Sumatra Fencing Athlete

No	Kelas Interval	Frekuensi Absolut (Fa)	Frekuensi Relatif (Fr)	Category
1	53 >	0	0.00	Very well
2	43–52	2	14.29	Well
3	34–42	5	35.71	Enough
4	25–33	6	42.86	Not enough
5	< 24	1	7.14	Less once
Amount		14	100%	
Average		35.5		Enough
Maximum Score		45.2		Well
Minimum Score		23.6		Less once

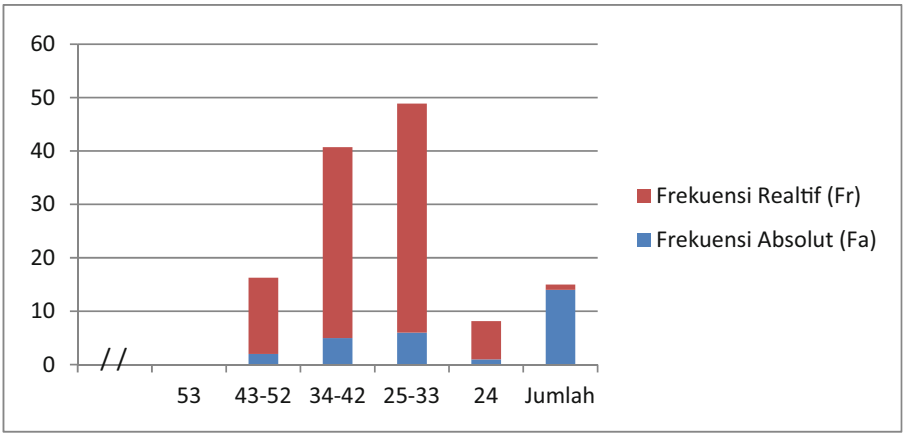

Fig. 1. Histogram of VO2 max, level West Sumatra Fencing Athlete

max level based on the measurement results. Furthermore, all data were processed using the frequency tabulation formula, and this answered the research questions posed in this study, namely; "How is the VO2 Max level of the West Sumatran Fencing athlete?

Based on the results of data analysis, that the level of VO2 max for West Sumatran fence athletes who are being prepared to take part in the 2015 National/Pre-PON Championships is more dominant in the less category, namely 6 people (42.86%) out of 14 athletes. It is feared that athletes will not be able to perform optimally in participating in competitions, because after all, an athlete's ability to perform optimally must have high endurance. High endurance supported by high VO2 max level.

The low level of VO2 max owned by the West Sumatran fencer is, of course, caused by many factors, among these factors are; It is possible that the training program carried out by athletes has not been maximized [6]. Another possible factor is that the forms

of training provided by coaches to athletes are more technical training than physical training.

Another factor that can cause a low level of VO2 max in athletes, possibly due to the athlete's low nutritional status, which affects the hemoglobin level and the supply of energy needed, because to provide large amounts of energy during training or participating in competitions, oxygen is needed to be carried. by hemoglobin from the lungs to all body tissues that need it, including skeletal muscles that are actively working (contracting). Oxygen is needed in body tissues for the purposes of aerobic energy metabolism processes. The amount of oxygen that reaches the body's tissues at least depends on the level of a person's VO2 max [7, 8]. A high VO2 max level, will support the maximum energy metabolism process, so that it will produce a large amount of energy and in the end a person's endurance level will also increase.

4 Conclusion

The level of VO2 max owned by West Sumatran fencing athletes is dominant in the poor category, with details; Of the 11 athletes, for the very good category there were none (0%), for the good category as many as 2 people (14.29%), the sufficient category were 5 people (35.71%), for the poor category as many as 6 people (42.86%), while the less category is 1 person (7.14%).

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