



Maximum Oxygen Volume Levels and Oxygen Saturation Athletes of Puslatda PON XXI DIY

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Abstract. This research aims to determine the level of oxygen volume and oxygen saturation of the PON XXI DIY Puslatda athletes. This research is quantitative descriptive research using survey methods with tests and measurements. The subjects in this research were PON XXI DIY Puslatda athletes, totaling 41 athletes from 14 sports. The data analysis technique used in this research is quantitative descriptive analysis expressed in percentage form. Research shows that the level of Maximum Oxygen Volume (VO_2 Max) in Puslatda Pra Pon DIY athletes is in the good category as many as 2 people (4.9%), in the sufficient category as many as 4 people (9.7%), in the poor category 17 people (41.5%), which was categorized as very low, 18 people (43.9%), while the oxygen saturation in the Puslatda Pra Pon XXI DIY athletes was all in the normal category (100%).

Keywords: VO_2 max, oxygen saturation, Puslatda, PON XXI DIY.

1 Introduction

An athlete's physical condition and health play an important role in achieving sporting achievements. An athlete's good physical condition and health will be able to show their best capacity or performance on the field. KONI DIY has implemented a regional training camp (Puslatda) to prepare for taking part in Pre-PON in order to obtain tickets for PON XXI in Aceh and North Sumatra. The Puslatda carried out by KONI DIY has started on April 1 2022. During the Puslatda athletes must take part in decentralized training in their respective sports. The training material consists of: physical, technical, tactical and mental.

Sport provides an important possibility to improve physical conditions consisting of flexibility, muscle strength, agility, power, speed and endurance. In a sport, the components of physical condition that are really needed are also prerequisites that an athlete must have in order to improve and develop optimal sporting performance, therefore physical condition must be developed and improved according to the characteristics, and the needs of each sport. A very necessary prerequisite for improving performance is physical condition [1]. The importance of each individual's physical condition must be realized by each individual to achieve achievement. One important factor in achieving sporting achievements is that an athlete must have elements of

mastery of technique, tactics, physical condition and mental abilities [2]. To find out what kind of physical condition is needed and what level of physical condition is needed and to increase maximum performance, it requires understanding and comprehensiveness [3]. To achieve an appropriate level of physical condition, continuous training is needed [4].

Physical condition is a need necessary to improve athlete performance, and can be considered a basic need that cannot be postponed or negotiated [5]. Physical condition is the main factor that an athlete must have, although it does not neglect other aspects such as technique, tactics and mentality. The physical condition of an athlete varies, in order to maintain and improve physical condition well, an athlete must also try to pay attention to the factors that influence it. The physical condition element should be able to reach the predetermined criteria so that the athlete's physical quality is in good condition or standard, which will really support the athlete's performance during the competition. Therefore, it is important to improve the physical condition component with systematic and well-planned physical training. Exercise will bring about physiological changes in the body. By knowing the physiological changes in the body, trainers can design a program to get optimal changes according to what they expect.

Oxygen saturation is the presentation of hemoglobin bound to oxygen in the arteries. Most of the oxygen in the blood is transported bound to hemoglobin. Factors that influence oxygen saturation are the amount of oxygen entering the lungs (ventilation). When doing physical exercise, oxygen requirements will increase in line with increasing work intensity [8]. The minimum value for oxygen saturation is 95-100%, if oxygen saturation is below 85% it indicates that the tissue does not have enough oxygen

2 Method

This research is descriptive research, data collection uses survey methods with tests and measurements. The instruments used to measure VO_2 max levels are using the Bleep Test and oxygen saturation using a pulse oximetry tool. The subjects of this research were 41 Puslatda PON XXI DIY athletes from 14 sports:

3 Result

Based on the research results, it is known that the VO_2 max level of Puslatda PON XXI DIY shows that the level of Maximum Oxygen Volume (Vo_2 Max) in Puslatda Pra Pon DIY athletes is in the good category as many as 2 people (4.9%), in the sufficient category as many as 4 people (9.7%), categorized as less than 17 people (41.5%), those categorized as very less than 18 people (43.9) and the oxygen saturation of the Pre PON XXI DIY Puslatda athletes was in the normal category (100).

Table 1. VO_2 max of Puslatda Athlete.

No	Category	Number of Athletes
1	≤ 30	9
2	31 - 35	9
3	36 - 40	10
4	41 - 45	7
5	46 - 50	4
6	≥ 50	2

Table 2. Oxygen Saturation Results.

No	Category	Number of Athletes
1	90 - 95	-
2	96 - 100	41

4 Discussions

VO₂ max is the maximum aerobic capacity, describing the maximum amount of oxygen consumed per unit time by a person during exercise or testing, with increasingly heavy exercise until fatigue. An athlete who has a good VO₂ max shows that the athlete has good endurance and fitness. This is in accordance with the sloth's opinion that the exercise carried out can improve aerobic exercise performance and aerobic power in terms of increasing VO₂ max [9]. An athlete should have good fitness to support his achievements. Research has shown a strong correlation between cardio respiratory fitness (VO₂ max) and cardiovascular health [9].

VO₂ max for PON XXI DIY Puslatda athletes to identify athletes' physical condition, can also be used to determine athletes' strengths and weaknesses. This is used as a basis for compiling the PON Puslatda training program. The research results show that sports that require high endurance such as karate, pencak silat, taekwondo obtain high VO₂ max values. Meanwhile, archery, bodybuilding and kite flying have low VO₂ max results. This could be because this sport does not really require a high VO₂ max. Each sport has different characteristics. There are two things that need to be considered in specific principles, namely; (1) doing exercises according to the characteristics of certain sports, (2) doing exercises to develop specific biomotor abilities in sports [10].

Even though various sports are closely related to the respiratory system, there are differences in their values. Even though it is not a main component in every sport, the role of VO₂ max is needed to support other components. Cardiovascular fitness is known to be a direct marker of physiological status. In addition, it reflects the overall capacity of the cardiovascular and respiratory systems and the ability of the lungs to perform prolonged physical activity [9]. Athletes who have a high VO₂ max have many advantages. The greater a person's VO₂ max capacity, the load when they receive heavy intensity in a match can be overcome [11]. that the higher a person's VO₂ Max (athlete), the higher his or her endurance and stamina [12]. Factors that influence VO₂ max levels depend on the supply and demand for oxygen in the body. Supply is the distribution of oxygen from the lungs to mitochondrial tissue, while demand means the value of mitochondria using oxygen in the process of oxidative phosphorylation. VO₂ max conditions are also influenced by the following factors: 1) age, 2) training, 3) altitude (O₂ levels) 4) Psychological factors . Meanwhile, the factors that

determine the VO_2 max value are lung function, cardiovascular function, red blood cells, body composition [10].

5 Conclusion

Research shows that the level of Maximum Oxygen Volume (VO_2 Max) in Puslatda Pra Pon DIY athletes is in the good category as many as 2 people (4.9%), in the sufficient category as many as 4 people (9.7%), in the poor category 17 people (41.5%), which was categorized as very less than 18 people (43.9%). Meanwhile, oxygen saturation in Puslatda Pra Pon XXI DIY athletes was all in the normal category (100%).

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