



Vo2Max Levels of Modern Ngawi IPSI Pencak Silat Atheles

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Abstract

Kemampuan seseorang untuk mengkonsumsi banyak oksigen selama aktifitas secara intensif, seperti berolahraga, dikenal sebagai VO₂max. Tujuan dari penelitian ini adalah untuk mengetahui Tingkat VO₂max atlet pencak silat IPSI Modern Ngawi. Jenis penelitian menggunakan pendekatan kuantitatif deskriptif. Penelitian ini akan menghasilkan data deskriptif, berupa data-data tertulis dari populasi, subyek dan obyek yang bisa diamati sebagai indikator penelitian. Sampel yang digunakan pada penelitian ini sebanyak 20 atlet. Teknik pengumpulan data ini menggunakan tes dan pengukuran Multi-Stage Fitness Test (Bleep Test) MFT. Hasil dari penelitian ini telah ditemukan terdapat adanya Tingkat VO₂max atlet. Dari hasil di antara 20 atlet pencak silat IPSI Modern Ngawi memiliki kemampuan VO₂Max yang baik. Hasilnya menunjukkan skor maksimum 51,6 dan skor minimum 36,9, dengan rata-rata (mean) 43,5 dan median 43,1. Oleh karena itu, berdasarkan hasil penelitian tentang kondisi fisik rata-rata (mean) dan median, kemampuan VO₂Max atlet masuk dalam kategori yang baik.

Keywords: VO₂max, MFT, pencak silat

Abstract

A person's ability to consume a lot of oxygen during intense activities, such as exercise, is known as VO₂max. The purpose of this study was to determine the VO₂max level of Modern Ngawi IPSI pencak silat athletes. This type of research uses a descriptive quantitative approach. This research will produce descriptive data, in the form of written data from populations, subjects and observable objects as research indicators. The sample used in this study were 20 athletes. This data collection technique uses tests and measurements of the MFT Multi-Stage Fitness Test (Bleep Test). The results of this study have found that there is an athlete's VO₂max level. From the results among the 20 IPSI Modern Ngawi pencak silat athletes have good VO₂Max abilities. The results show a maximum score of 51.6 and a

minimum score of 36.9, with a mean (mean) of 43.5 and a median of 43.1. Therefore, based on the results of research on the average (mean) and median physical condition, the athlete's VO2Max ability is in the good category.

Keywords: VO2max, MFT, pencak silat

Introduction

In RI Law no. 3 of 2005 concerning the National Sports System CHAPTER II, Article 4 stated "National sports aim to maintain and improve health and fitness, achievement, human quality, instill moral values and noble character, sportsmanship, discipline, strengthen and foster national unity and integrity, strengthen resilience national level, as well as elevating the nation's prestige, dignity, and honor." (Law No. 3 of 2005, 2005)

Sport is a physical activity carried out with the aim of increasing body fitness, developing motor skills, and creating entertainment and competition. Sports usually involve physical movements, such as running, jumping, swimming, or using special tools such as balls, rackets, or other equipment. In addition to physical benefits, exercise can also provide psychological benefits, such as improving mental well-being, reducing stress, increasing self-confidence, and improving social skills (Wijaya & Yusuf, 2020).

In sports, the aspirations and noble values of society are reflected, which are translated into the desire to achieve self-fulfillment through sporting achievements. We often hear that the progress of a country is reflected in its sporting achievements. It is hoped that sport in Indonesia can be used as a social driving machine to produce superior human beings, both physically, mentally, intellectually, socially and being able to form a complete human being.

One sport that can increase endurance, social and achievement is pencak silat. Pencak Silat is one of the typical martial arts of the Indonesian people, which is a legacy from their

ancestors that has been attached to Indonesian society. Pencak silat comes from two words, namely 'pencak' and 'silat'. The meaning of pencak is the basic movement of self-defense and is bound by rules. Whereas silat means perfect self-defense moves that originate from spirituality (Nur Wahyudi et al., 2021).

Physical exercise is an activity that involves physical movements that are deliberately carried out regularly and planned to improve body fitness and general health. The main goals of physical exercise are to strengthen muscles, increase strength and endurance, increase flexibility, increase cardiorespiratory capacity, and improve coordination and motor skills (Nohan & Wahyudi, 2021).

Before competing, athletes must practice before the competition to improve their physical condition. This is useful for staying ready to face the physical and mental pressure caused by the match. To be the most prepared athlete before a game, they need to be in good shape to deal with the pressure they will face during the game. Therefore, not only mentality, technique and tactics are important in every match, but also good physical condition during every training session and match (Lindianawati et al., 2022).

A person's ability to consume a lot of oxygen during intense activity, such as exercise, is known as VO2max. In addition, VO2max is measured in liters per minute or milliliters/minute/kg body weight. Therefore, a lower VO2max level when a person is active for a long time is proportional to a higher activity level, which means that a person with a higher activity level tends to experience fatigue. Measuring VO2max shows that the body

can provide oxygen through active muscles and allows the muscles to use oxygen (Siregar et al., 2022).

Maximum Oxygen Volume (VO₂ Max) is the body's ability to process oxygen during intense activities. In other words, VO₂ Max is a person's ability to use oxygen optimally during work or sports activities. Pencak silat, like other martial arts, uses an energy system to compete. In the sparring and arts categories, aerobic and anaerobic exercises are used equally. Pencak silat athletes use aerobic exercise when performing developments or step patterns, while anaerobic exercise is used when attacking, defending, and performing dropping techniques. The game of pencak silat requires aerobic exercise because of the long time. Pencak silat athletes need sufficient capacity to accommodate oxygen, or VO₂ Max, because aerobic exercise requires a lot of oxygen to be delivered to the muscles, along with carbohydrates, proteins and fats to be processed into energy. (Mardius, 2021).

The development of pencak silat at IPSI Modern Ngawi is currently quite good. The facilities and infrastructure to facilitate training at IPSI Modern Ngawi are good and sufficiently complete to encourage athletes to excel. Athletes train once a week, namely on Wednesday. Through observation on March 29, 2023 which was carried out through direct observation. When researchers are making direct observations, researchers see athletes who are practicing pencak silat, when practicing or competing, researchers see athletes get tired quickly, therefore a good VO₂Max is needed. The purpose of this research is to determine the VO₂max level of Modern Ngawi IPSI pencak silat athletes.

Method (15%)

This type of research is classified as quantitative descriptive research. Quantitative descriptive research is to describe, examine, and explain something

that is studied as it is, and draw conclusions from observable phenomena using numbers. Quantitative descriptive research is research that only describes the contents of a variable in research, not intended to test a particular hypothesis. Thus it can be seen that quantitative descriptive research is research that describes, examines and explains a phenomenon with data (numbers) as they are without intending to test a particular hypothesis (Sulistiyawati et al., 2022).

The subjects and objects studied aim to know and understand the VO₂max level of the Modern Ngawi IPSI pencak silat athletes, while the object of this research is the Modern Ngawi IPSI athletes. Data collection in this study was using the survey method, with data collection techniques in the form of tests and measurements.

The population of this study were 30 IPSI Modern Ngawi athletes. Meanwhile, the sample used in this study was only 20 people, in which the researchers used a purposive sampling method, namely a sampling technique taking into account certain characteristics (Ridwan, 2020).

For these considerations, the researcher determined 1) male and female Pencak Silat athletes 2) attended regular training at IPSI Modern Ngawi 3) athletes aged 16-21 years.

Data collection techniques in this study used survey methods with test and measurement techniques. The subjects in this study were IPSI Modern Ngawi Pencak Silat Athletes. The data taken in this study is primary data, which is data taken when carrying out the MFT test by researchers. The data collected in this study are the results of tests and measurements of the VO₂max level of IPSI Modern Ngawi Pencak Silat Athletes.

Test results data were analyzed using descriptive statistics. As for the VO₂max Classification Norm assessment category with the Bleep Test in the following table:

Table 1. VO2 max Classification Norms with Bleep Test

No	Classification	Athlete	
		Son	Daughter
1.	Height	> 53	>49
2.	Good	43 – 52	38 – 48
3.	Enough	34 – 42	31 – 37
4.	Currently	25 – 33	24 – 30
5.	Low	< 24	< 23

Results and Discussion

Results

Research results are presented in the form of graphs, tables, or descriptive. Analysis and interpretation of these results is necessary before they are discussed.

Table 2. Test results and measurements of MFT levels and returns

No	Sex	Vo2max	Category
Rigid	L	45,5	Good
Deni	L	45,2	Good
Annas	L	43,3	Good
Basil	L	38,9	Enough
Dimas	L	39,6	Enough
Dani	L	49,3	Good
Sholikin	L	51,6	Good
Strong	L	49,3	Good
Ibrahim	L	43,3	Good
Aziz	L	42,6	Enough
Nurlina	P	45,2	Height
Praise	P	36,8	Enough
Surprise	P	39,6	Good
d			
To	P	40,8	Good
Mustika	P	42,2	Good
Devicha	P	42,6	Good
Because	P	42,9	Good
Diah	P	46,2	Good
Diamond	P	46,2	Good
Risa	P	38,5	Good
Amount		869,6	
Max		51,6	
Min		36,9	
Rerata		43,5	
Median		43,1	

Table 3. Vo2Max Assessment Criteria

Interval Class	Frequency		Is
	But	%	
>50cc/kg/mnt	1	5,00	BS
43-52cc/kgBB/min	15	85,00	B
34-42cc/kgBB/min	4	15,00	C
25,0-33cc/kgBB/mnt	0	0,00	K
<25.0cc/kgBB/min	0	0,00	KS
Amount	20	100	

Discussion

STKIP Modern Ngawi martial arts athletes have good VO2max. VO2max is a measure used to evaluate a person's maximal aerobic ability, which is the body's ability to use oxygen during intense physical activity. The higher the VO2max value, the better a person's ability to absorb and use oxygen, which in turn can increase endurance and athlete performance. STKIP Modern Ngawi pencak silat athletes undergo intensive and special training designed to increase their VO2max. Aerobic exercises such as running, cycling and swimming are usually an important part of their training program. This exercise helps strengthen the cardiorespiratory system, increase lung capacity, and increase the body's ability to produce energy efficiently through oxidative metabolism.

Apart from aerobic exercise, anaerobic exercise is also part of the STKIP Modern Ngawi pencak silat athlete training program. This exercise involves weight training and interval training which aims to increase muscle strength and explosive power. By increasing muscle strength, athletes can optimize their use of energy during competition and reduce fatigue associated with intense physical activity. Through a combination of aerobic and anaerobic exercises, STKIP Modern Ngawi pencak silat athletes can increase their VO2max significantly. This gives them an edge over the competition, as they have the ability to maintain high intensity and

performance over a longer period of time without undue fatigue.

It is important to note that achieving a good VO₂max does not only depend on physical exercise, but also involves other factors such as proper nutrition, adequate recovery and individual genetic factors. The team of trainers and medical staff at STKIP Modern Ngawi work together to develop a holistic training program and ensure athletes get the support they need to achieve optimal VO₂max. With a good VO₂max, the STKIP Modern Ngawi pencak silat athletes have an advantage in the competition. They can face matches better and improve their endurance in the face of intense training and competition. This advantage gives them a better chance to achieve great results in pencak silat.

The amount of oxygen in milliliters per body weight in kilograms per minute or the amount of oxygen in liters per minute (l/min) are two ways that can be used to measure VO₂Max. Of course, athletes with higher VO₂ Max will have better endurance and stamina. Its higher oxygen consumption, better supply of blood vessels to the muscles and larger lung capacity, can produce more hemoglobin and red blood cells, and the heart becomes stronger (Muhali, 2018).

The results showed that the Vo₂Max level of 20 IPSI Modern Ngawi pencak silat athletes was in the High category for 1 person (5%), Good for 15 people (85%), and Enough for 4 people (10%). Based on the results of the study, the average ability of IPSI Modern Ngawi pencak silat athletes is in the Good category. It is expected that fighters will have good Vo₂Max by doing systematic Vo₂Max training and following the research Vo₂Max test guidelines.

The knot

Based on the results of the research on the Vo₂Max level of Modern Ngawi pencak silat athletes, there were 20 people

with a VO₂ Max Classification in the High category of 1 person (5%), Good as many people (85%), and Enough as many as 4 people (10%). The average max ability of the Ngawi Modern IPSI Pencak Silat Athletes is in the Good classification. From the results of these data it can be concluded that the Vo₂Max level of pencak silat athletes at IPSI Modern Ngawi taken from 20 samples has this average and is included in the Good classification. In order for a fighter to have good Vo₂Max, it is expected that the athlete will carry out routine Vo₂Max training in a structured manner and follow the guidelines for the research Vo₂Max test that has been given.

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Author Profile

Vicky Nusa Prasety Zulkarnain merupakan mahasiswa strata 1 Pendidikan Jasmani Kesehatan dan Rekreasi STKIP Modern Ngawi angkatan tahun 2019. Lulus tahun 2023 aktivitas saat ini menjadi pendidik di salah satu sekolah dasar Negeri Kabupaten Ngawi mata pelajaran PJOK.

Andy Widhiya Bayu Utomo dan Arief Nur Wahyudi adalah dosen tetap Sekolah Tinggi Keguruan dan Ilmu Pendidikan Modern Ngawi