

# ABILITIES AND DIFFERENCES IN PHYSICAL CONDITIONS OF KARATE ATHLETES IN INTENSE SPORTS ACTIVITIES BASED ON GENDER

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## Abstract

An athlete's strategy to obtain optimal performance must be to have good physical condition. It is very effective if there is no difference in the physical condition of male and female athletes, so that there is no gap in performance between male and female athletes. VO<sub>2</sub>max is the maximum amount of oxygen that the body can use in 1 minute when the muscles do a lot of exercise and VO<sub>2</sub>max can provide general ability results in assessing a person's intense physical ability in carrying out intense sports activities. This research aims to determine the abilities and differences in physical conditions of male karate athletes and female karate athletes in intense sports activities. The method used in this research is a quantitative descriptive method. Physical condition data was obtained from VO<sub>2</sub>max results, then analyzed statistically using the T-Test involving 20 Padang City karate athletes, 10 men and 10 women. The results of our research findings showed that the average physical condition of male karate athletes (47.06) was in the good classification and the average physical condition of female karate athletes (38.36) was also in the good classification. Based on these results, it was found that the physical condition of male karate athletes was better than the physical condition of female karate athletes, seen from the average male athletes being taller with an average difference of 8.7 from female athletes. Strengthened by statistical results, there are differences in the physical condition of male and female athletes in intense sports activities with ( $p < 0.005$ ). Therefore, instructors, coaches and practitioners should focus more on training that can improve physical condition in order to obtain optimal performance results and the physical condition of athletes, both male and female, so that there is no gap in achievement.

**Keywords:** Physical Condition, VO<sub>2</sub>max, Karate, Gender.

## INTRODUCTION

To be a professional athlete you must have a very good physique (Yuliana & Wahyudi, 2022). Physical condition itself is a word that can never be separated from describing the condition of the human body. The interpretation of physical conditions begins with the meaning of the word physical condition itself. Condition is the meaning of the situation, while physical is the meaning of the body. So in the sense of the word physical condition is the condition of the body (Herpandika et al., 2019). Physical conditions are a complete unit of components (Wiwoho, 2014) for athletes to demonstrate their abilities in carrying out sports activities (Lufisanto, 2015). Physical condition is a physical condition that describes the physical potential and ability to carry out certain tasks with optimal results without showing significant fatigue.

Physical condition is the basic foundation for improving other abilities possessed by every athlete if they want to achieve achievements (Ziqra & Welis, 2019). The great benefits provided by exercise can reduce the risk of disease and maintain a healthy

body (Meo et al., 2021). Lack of activity in moving is the main cause (Fajar & Iswahyudi., 2018). Indirectly, physical condition is an important factor for someone who exercises in everyday life. Physical conditions are composed of several components that complement each other. Strength, endurance, flexibility, agility, balance, accuracy, reaction, coordination, speed and power (Yusuf & Padli, 2020). Athletes with good physical condition have several advantages, including: athletes are able and easy to learn relatively difficult skills, do not get tired easily when participating in training or competitions, training programs can be completed without many obstacles, and can complete difficult tasks. Physical condition is very necessary for an athlete (Iqroni, 2017). Therefore, exercise is very important to keep your body fit. Physical condition is the most important component in achieving achievement (Supriyoko & Mahardika, 2018).

Lack of physical condition, sedentary behavior which results in low levels of fitness risks the emergence of various non-communicable diseases (Lavie et al., 2019) like tiredness. Fatigue is one of the consequences if an athlete does not have good physical condition, this greatly affects an athlete's maximum performance and also an athlete's optimal performance. Vice versa, if a karate athlete has good and excellent physical condition, then the athlete is able to produce his best performance and achieve optimal performance.

The definite goal of an athlete and coach is to obtain optimal performance. Athletes need to achieve or produce the highest level of sporting performance in order to be able to stand on the highest podium. For top competitors, knowing how to select and join in preparing projects to further develop their branding execution is fundamental. In general, intense sports activities are activities that can use up a lot of energy in the process (Laursen, 2010). Where in the situation of performing a sports activity that has a fairly high load. The body's normal homeostatic ability when carrying out intense sports activities can be realized by regulating and maintaining a (regular) breathing rhythm to minimize fatigue (Hostrup & Bangsbo, 2017). Therefore, the ability to regulate breathing has an important role in maintaining body homeostasis when carrying out intense sports activities and physical condition is very necessary in every effort to improve athletes' performance (Meliala, 2019).

One of the intense sports activities is karate, Karate is a branch of martial arts where the form of movement uses the feet and hands such as punching, parrying and kicking. And it is a Japanese martial art where the activities always require punching, kicking, parrying, throwing, agility, with power and both in Kata and Kumite (Pramata, 2016). Karate is a high intensity intermittent exercise with aerobic and anaerobic exercises (Herrera-valenzuela et al., 2021). The sport of karate not only requires athletes to be able to demonstrate movements correctly, but also requires athletes to have an interest in practicing (Yasmitika et al., 2020) and good basic abilities such as physical. Physicality in karate must be intense and must apply the principle of super compensatory training. With these elements, athletes can equip themselves with sufficient knowledge.

Cardiovascular endurance is often referred to as Vo2max which means maximum oxygen volume (Ariestika & Nanda, 2020), Vo2max is the maximum capacity of the pulmonary, cardiovascular and muscular systems to absorb oxygen. VO2Max training and serious play are closely related to keeping up with an athlete's execution. VO2max is a very important factor for every athlete to achieve maximum performance (Hudain

et al., 2023). it is very important to know the VO<sub>2</sub>max levels and the appropriate needs for athletes who are always faced with busy schedules, because increasing VO<sub>2</sub>max can bring positive factors to physical endurance (Rubiyatno et al., 2023).

Therefore, the explanation above is the basis for researchers to conduct this research which aims to determine the abilities and differences in physical conditions of male karate athletes and female karate athletes through VO<sub>2</sub>max in intense sports activities.

## METHOD

The method used in this research is a qualitative descriptive method. The descriptive method is concerned with revealing the "essence" or "essential structure" of the phenomenon under study, namely revealing the characteristics that make it a fact, not other characteristics (Besok et al., 2015). Researchers took the population of Padang City Karate Pelatda athletes, with a sample of 10 men and 10 women. The average age of these athletes is 24.8 years, weight 59.65kg, height 163.7cm and BMI 22.24. In an effort to obtain relevant data, researchers used the VO<sub>2</sub>Max test instrument method. VO<sub>2</sub>max is the maximum amount of oxygen that the body can use in 1 minute when the muscles are exercising a lot (Williams et al., 2017). VO<sub>2</sub>max can provide general ability results in assessing a person's intense physical abilities. The following is a standard classification table for men's and women's VO<sub>2</sub>max abilities.

**Table 1: Standard Classification of VO<sub>2</sub>max Ability**

NO	Man	Woman	Classification
1	X > 55.9	X > 41.9	Superior
2	51 - 55.9	39.0 - 41.9	Very good
3	45.2 - 50.9	35.0 - 38.9	Good
4	38.4 - 45.1	31.0 - 34.9	Fair
5	35 - 38.3	25.0 - 30.9	Poor
6	X < 35.0	X < 25.0	Very poor

## RESULTS AND DISCUSSION

This research obtained participant description results which included age, gender, weight, height and BMI, which can be seen in table 2.

**Table 2: Description of Participants**

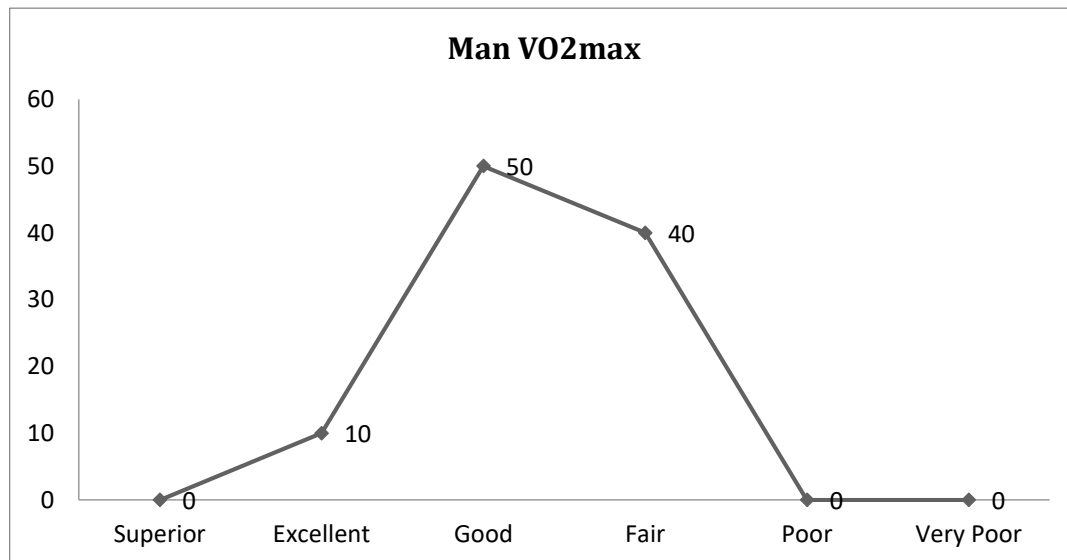
Variable	Entire Sample (N = 20)
Sex, No.	
Man	10
Woman	10
Characteristics, Overall Sample, and mean ± SD.	
Your age	24.8
Height, m	163.7 ± 5.06
Mass, kg	59.65 ± 6.92
body mass index	22.24 ± 2.16

### Physical Condition of Male Karate Athletes

Next, the results and percentage of physical condition of male karate athletes are presented (Table 3 and Graph 1).

**Table 3: Description of the VO2max Percentage Profile of Male Karate Athletes**

Classification	Man	Frequency	Percentage
Superior	X > 55.9	0	0%
Very good	51 - 55.9	1	10%
Good	45.2 - 50.9	5	50%
Fair	38.4 - 45.1	4	40%
Poor	35 - 38.3	0	0%
Very poor	X < 35.0	0	0%
Amount		10	100%



**Figure 1: Results of Physical Condition (VO2max) of Male Karate Athletes**

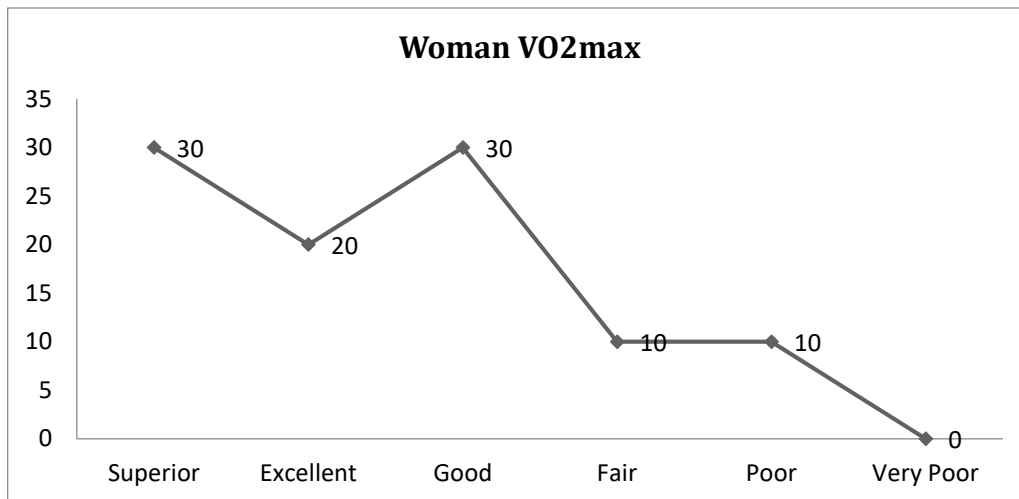
It can be seen from table 2 and figure 1 that there are 5 male athletes with a percentage of 50% in the good classification, 4 male athletes with a percentage of 40% in the fair classification, 1 male athlete with a percentage of 10%. on the classification of very good and not. There are male athletes in the superior, poor and very poor classifications.

### Physical Condition of Female Karate Athletes

Furthermore, the results and percentage of physical condition of female karate athletes (Table 4 and Graph 2).

**Table 4: Description of VO2max Percentage Profile for Female Karate Athletes**

Classification	Woman	Frequency	Percentage
Superior	X > 41.9	3	30%
Very good	39.0 - 41.9	2	20%
Good	35.0 - 38.9	3	30%
Fair	31.0 - 34.9	1	10%
Poor	25.0 - 30.9	1	10%
Very poor	X < 25.0	0	0%
Amount		10	100%



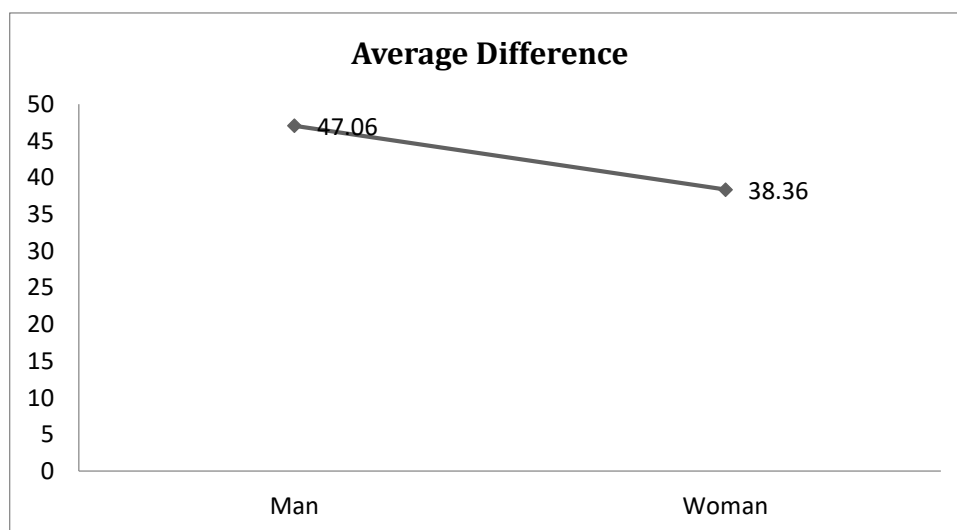
**Figure 2: Results of Physical Condition (VO2max) of Female Karate Athletes**

It can be seen in table 4 and figure 2 that there are 3 female athletes with a percentage of 30% in the superior classification, 2 female athletes with a percentage of 20% in the very good classification, 3 female athletes with a percentage of 30% in the good classification, there are only fair and poor classifications. There is 1 female athlete each with a percentage of 10% and there are no female athletes who are in a very low classification.

Then a factual picture of the condition of male and female karate participants is presented in table 5 and figure 3. It was found that the normal result for the gathering condition of male karate participants is (47.06) in the large characterization and the actual gathering capacity of female participants is (38.36). ) in major groupings in this review.

**Table 5: Statistical description of athletes' physical condition**

Group	N	VO2max		Minimal	Maximum	M±SD	Classification
		Level	Turn it over				
Man	10	9	7	43	52.5	47.06 ± 3.19	Good
Woman	10	7	6	29.9	43.3	38.36 ± 4.51	Good



**Figure 3: Graph of Physical Condition Results for Male and Female Karate Athletes**

After getting the results of the physical condition of the male and female athletes, they continued with statistical tests. Judging from table 6, the data is normally distributed and the population is homogeneous as shown by ( $p > 0.05$ ).

**Table 6: Analysis Requirements Test**

Normality test						Homogeneity Test		
Kolmogorov-Smirnov			Shapiro-Wilk			Levene Statistics		
Statistics	df	P	Statistics	df	P	df1	df2	P
0.124	20	0.200	0.946	20	0.309	1	18	0.235
0.153	15	0.200	0.953	15	0.580	1	28	0.403

Note: Data is normally distributed and homogeneous if ( $p > 0.05$ )

Next, after the analysis requirements have been met, we continue with hypothesis testing using the independent samples test. As presented in table 7, the table shows that there are significant differences in the physical condition of male athletes and female athletes in intense sports activities.

**Table 7: T-Test**

Independent samples test (T-Test)				
Group	t	df	p	Conclusion
Male vs Female	4,973	18	0.00	Significant

Note: Significance ( $p < 0.05$ )

Based on the results of this examination, it is known that in general the condition of male participants shows excellent characterization with a percentage of 10%, decent order with half, fair grouping with a percentage of 40%, and there are no male competitors in the group. dominant, bad and very bad characterization.

Furthermore, the overall physical condition of female athletes showed a classification of 30% superior, 20% very good, 30% good, 10% fair, 10% poor and no female athletes were classified as very poor. Furthermore, the results of the statistical description of the physical condition of male karate athletes are classified as good with VO<sub>2</sub>max level 9 with a return of 7 with an average of (47.06) and female karate athletes are classified as good with VO<sub>2</sub>max level 7 with a return of 6 with an average of (38.36). Furthermore, there is a significant difference between male karate athletes and female karate athletes in intense sports activities with ( $p < 0.05$ ).

In line with research (Ma et al., 2023) that intense exercise can improve physical condition through increasing VO<sub>2</sub>max. Apart from that, research (Hutama & Yuliasitri, 2017) And (Reza Ramadani, Roma Irawan, Padli, 2020) also revealed VO<sub>2</sub>max is a condition for meeting the physical ability standards that must be possessed so that the body does not get tired quickly when participating in a match. In line with research (Putra & Ita, 2019) VO<sub>2</sub>max can measure the level of an athlete's physical condition.

Based on (Nevill et al., 2020), that VO<sub>2</sub>max increases with greater actual work, and vice versa, with lower active work, competitors' actual work becomes less, this is influenced by weight status, age and orientation. Apart from that, VO<sub>2</sub>max can also measure differences in vital lung capacity in students who live in high and low altitudes (Bafirman et al., 2023). According to research (Triansyah & Haetami, 2020) VO<sub>2</sub>max can also measure several diseases such as Delayed Onset Muscle Soreness (DOMS) after high or low intensity exercise.

This analysis is carried out by involving rates in obtaining various types of information. So the results of the examination were obtained which showed that the condition of the Padang City karate athletes was in a good class, both male and female karate athletes. This means that good conditions are influenced by a good preparation process. So that the preparation goals can be achieved ideally.

The state of the focus of this research, assuming looking at the experimental results, clearly shows good classification. As a result, the programmed training process can clearly show that the athlete's physical condition is influenced by the training (Zawawi & Burstiando, 2020).

A competitor that looks great will have a faster recovery cycle during readiness and during competition (Ayubi, 2017) so that it will make it easier for members to move and play seriously and be able to use the right development techniques (Azidman, 2017).

Apart from that, a person's physical condition is also influenced by several factors, including: 1) factors related to exercise, 2) factors related to the principles of training load, 3) factors related to rest, 4) factors related to healthy living habits, 5) environment. factors, and 6) food factors (Pujianto, 2015) and body mass index (Welis et al., 2023) also affects physical condition (Rusmanto, Rola Angga Lardika, 2020) dan (Tarigan & Lardika, 2023). Based on (Abdullah et al., 2023) Physical condition also influences learning outcomes.

Conditions are states of the body that can change depending on how parts of the body are actually focused. This means that conditions can be prepared and adjusted completely according to each person's needs with reasonable, measured and moderate settings. so that improvements in each part will go hand in hand with each other.

As in the following explanation, periodization can be interpreted as an initial arrangement, where a participant's maximum activity occurs by preparing potential biomotor parts and checking weaknesses and comfort. In addition, it stands to reason that, in sports including delayed persistence, the best conditions should be achieved at the start of the competition year and followed throughout the season.

This shows that long-term programs and time for centralized training are needed. So the maximum operational goal must be achieved in each game and looking at the nature of the circumstances is also very important (Purwanto, 2022). Looking at the discussion above, physical condition status is very necessary to monitor the condition of athletes who have been trained.

Therefore, Padang City athletes undertake a long training process in order to achieve Puslatkot targets which pay attention to physical condition as a benchmark and basis for athletes in carrying out the correct training program.

## CONCLUSION

Based on the results of research and discussion, male karate athletes and female karate athletes are simultaneously classified as good. However, if you look at the statistical results, the physical condition of male karate athletes is much higher than that of female karate athletes. It can be seen that, male karate athletes at a VO<sub>2</sub>max level of 9 with a return of 7 with an average of (47.06) compared to female karate athletes at a VO<sub>2</sub>max level of 7 with a return of 6 with an average of (38.36).

This shows that there is an average difference of 8.7 between male karate athletes and female karate athletes and there is a difference between male karate athletes and female karate athletes in intense sports activities. Therefore, it is necessary to pay attention to the physical abilities of athletes by focusing more on training that can improve physical condition because it can provide positive results on athlete performance, and so that there is no gap in the performance of male athletes with female athletes.

### Conflict of Interest

The authors report no factors of interest

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