



The Body Mass Index towards Physical Fitness in Pencak Silat Athletes

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Abstract

The study aims to know whether body mass index affects physical fitness in pencak silat athletes in Palopo. This is a descriptive quantitative study with Body mass index as the independent variable, and physical fitness as the dependent variable. This study focused on 15 pencak silat athletes from Palopo. SPSS application, descriptive techniques, categorization, data normality, correlation, and regression tests were utilized to analyze the data. The findings of this research show that: Pencak silat athletes in Palopo City have a body mass index of 93 percent, which is considered normal. It means pencak silat competitors in Palopo have a strong level of physical fitness, with a score of 73 percent. Based on this data can be conclude that there is a significant contribution of body mass index to physical fitness in pencak silat athletes in Palopo City which is 64.5%.

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INTRODUCTION

Pencak silat is a martial art that was passed down by our ancestors as Indonesian culture that needs to be preserved, fostered, and developed, Kriswanto (2015) in wijaya (2020). Or pencak silat is often interpreted as traditional martial arts which is centered in Indonesia. According to the fighters, the term pencak silat is divided into two different meanings. According to the Bawean pencak silat teacher, Syukur (2014) in Alkharizmi (2019) states "Pencak is a movement of beauty steps by avoiding, which includes the movement of comedy element. Pencak can be displayed as a means of entertainment, while silat is an element of technique self-defense parrying, striking, and locking which cannot be demonstrated in public".

Vertonghen & Theeboom (2010: 529) in Permatasari (2020) The popularity of martial arts has aided in the development of an increasing interest in martial arts research over the years, as evidenced by a variety of factors. To begin with, there are indications that more papers on martial arts have been submitted at sports science conventions in recent years.

Body mass index (BMI) is a mathematical formula related to body fat Arisman M (2010) in Hamdani (2016). This method is especially used when skinfold thickness measurements cannot be performed or standard values are not available. According to Afriwardi (2011) in Hamdani (2016) examination of body fat can be done by using a weight-height comparison method, known as body mass index (BMI) and measuring fat under the skin with a skinfold caliper. Meanwhile, according to Gibson (2016: 1) in Ramadona (2018) Body Mass Index (BMI) can be used to assess nutritional status or determine body composition proportion standards in adults, adolescents and children. According to Pudjiadi &

According to the Ministry of Health (2015) in Anjarwati (2019) Body Mass Index is one way to determine nutritional status by comparing weight and height. Supriasa (2017: 60) in Anjarwati (2019) explained that the Body Mass Index (BMI) is a simple tool to monitor nutritional status, especially those related to excess and underweight. Meanwhile, according to Arisman (2011) in Kusumawardhani (2016) the components of the Body Mass Index consist of height and weight. Height was measured by standing upright, without using footwear, both hands close to the body, back against the wall and gaze directed forward.

According to Pudjiadi & Hegar (2010) in Anjarwati (2019) BMI is the easiest way to estimate obesity and is highly correlated with body fat mass, besides that it is also important to identify obese patients who are at risk of medical complications.

Based on the opinions of several experts above, it can be concluded that BMI is a mathematical formula that serves as a guide for determining excess weight related to body fat using the weight and height comparison method.

A person's physical fitness is influenced by several factors. Research at the California Department of Health suggests there are 7 aspects of habits to achieve a healthy life and given a long life. The seven habits are: (1) exercising regularly, (2) getting enough sleep, (3) eating breakfast well, (4) eating regularly, (5) controlling body weight, (6) being free from smoking and drugs. prohibited, and (7) do not consume alcohol, Sharkey (2013) in Saputra (2018).

According to Suharjana (2013:10) in Saputra (2018) the factors that affect a person's level of physical fitness are as follows:

Age

Each age level has a close relationship with the level of physical fitness. Doctor Sundardas in his book entitled "The asian woman" guide to health beauty & vitality" which was published in 2001 stated that children's physical fitness will increase to a maximum at the age of 25 years and then after reaching the age of 30 years will experience a decrease in the functional capacity of the whole body, approximately 1% per year, but if you are diligent in exercising this decrease will occur. by 0.1% per year.

According to Ani (2012) in Oktian (2016) physical fitness in old age has actually begun to be formed at a young age, if the level of physical fitness at a young age is high, it will likely have an impact on a fitter old age fitness level. According to Laksmi (2011) in Oktian (2016), it is unknown that the rate of decline in a person's level of physical fitness will accelerate due to the age factor after entering the age of 30 years, but this can be slowed down by maintaining body weight, not consuming alcohol, and staying away from cigarettes. .

Gender

The level of physical fitness of male students is usually better than female students. This is because the physical activities carried out by male students are more than female students. Until puberty, the physical fitness of boys is usually almost the same as that of girls, but after puberty, boys usually have a much greater value.

Genetics

Genetics affect heart lung capacity, posture, obesity, hemoglobin (red blood cells) and muscles. According to Sharkey (2003) in Saptra (2018) that heredity is responsible for 25 to 40% of the difference in VO₂max values.

The selection of prospective fighters or athletes is very important to support talent and technical training in the sport itself, therefore the selection or search for breeding is very necessary, Athlete nursery is an effort to find and find individuals who have the potential to achieve sports achievements in the future as a step or an advanced stage of sports problems. Pencak silat whose form is a demonstration and training of all martial arts moves and techniques is carried out in full and explicitly with the aim of to maintain or improve physical fitness, agility and endurance.

Based on the observations, the researchers found that the athletes of Palopo City had different body postures or height and weight. Being overweight will have an effect on Body Mass Index (BMI) if it is not balanced with systematically structured exercise. This body weight is influenced by energy intake, but if it is excessive and without balanced energy expenditure, it will cause weight gain. The lower the level of physical activity and the less precise the diet, the chances of a continuous increase in BMI because BMI is influenced by several factors including diet and physical activity.

Each physical activity carried out has a different food intake depending on the length of intensity and muscle work. BMI and Physical Fitness are two interrelated variables because the higher the intensity of physical fitness, the better the BMI. Vice versa if the intensity of physical fitness is low, the BMI is getting worse. If this happens continuously, there will be an increase in BMI, but the level of physical fitness carried out must be in accordance with the portion, regularly, and not excessive in order to provide the best results.

A fighter, apart from being required to have good physical components, must of course be accompanied by an ideal body. Body Mass Index (BMI) is one way to find out the ideal body weight range and predict how big the risk of health problems is. This method is used to determine a healthy weight based on weight and height.

According to Adhitya Pradana (2014:1) in Ramadona (2018) there are several factors that can affect Body Mass Index either directly or indirectly.

According to Irianto (2017) in Kusumawardhani (2016) Body Mass Index as an anthro-

pometric index has advantages and disadvantages. One of the advantages of Body Mass Index is that it is easy to measure and can determine underweight and overweight. The drawbacks of the Body Mass Index itself are that it can only be used to monitor the nutritional status of adults over 18 years of age, cannot be applied to infants, teenagers, pregnant women and athletes, and cannot be used to determine nutritional status for people who suffer from diabetes, edema, ascites and hepatomegaly.

METHODS

This research is a correlational study. Correlational research is research conducted to determine whether there is a contribution between two or several variables, Arikunto (2010: 247) in Anjarwati (2019). The research instrument used is a form of test and measurement to find out the results of the body mass index on physical fitness.

This research was conducted in the city of Palopo, South Sulawesi Province, on June 13, 2021 with a total sample of 15 athletes. The technique used is Saturated Sampling if all members of the population are used as samples, the type of data used is quantitative by using statistical procedures or methods. -other means of quantification (measurement). Wijaya (2020) "The test is a systematic process to observe a person's behavior which is described using a scale in the form of numbers or systems with certain categories. Data retrieval Physical fitness test, Body Mass Index test. The data analysis technique used is descriptive and inferential statistics.

This research is a quantitative research so that the data analysis technique used is descriptive and inferential statistics because descriptive statistics are used to get a general picture and inferential statistics are used to test research hypotheses. So the statistical data is processed through a computer with Excel and the SPSS 23 program.

RESULTS AND DISCUSSION

In accordance with the variables, the research data obtained include: body mass index data and physical fitness in pencak silat athletes in Palopo City. The results of complete descriptive statistical calculations of body mass index and physical fitness data for pencak silat athletes in Palopo City can be seen in the appendix, while the summary of the calculation results is listed in **Table 4.** as follows:

Table 1. The results of descriptive analysis off body mass index and physical fitness data on pencak silat athletes in Palopo City

Statistics	N	BMI	Physical fitness
Average value	15	21,413	18.20
Minimum	15	18.4	15
Maximum	15	24.6	22
Range	15	6.2	7
Standard Deviation	15	1.7138	1,612

Body mass index: descriptive analysis result of body mass index data, obtained an average value of 21,413, a mean value of 21,100, a mode of 20.4, standard deviation of 1.7138, a variance of 2,937, a range of 6.2, a minimum value of 18.4, a maximum value of 24.6 and a maximum value of 24.6. a total of 321.2.

Physical fitness: descriptive analysis result of physical fitness data, obtained the average value of 18.20, the mean of 18.00, the mode of 18, the standard deviation of 1.612, the variance of 2.600, the range of 7, the minimum value of 15, the maximum value of 22 and the total value amounted to 273.

Data Categorization Results

This research data was analyzed using descriptive statistical techniques. The calculation technique uses a percentage. The data is categorized into five categories, namely: very good, good, moderate, poor and very poor.

Categorization is made based on the results of descriptive calculations that have been done previously. The results of the categorization of each research data are as follows:

Body mass index

Descriptive calculation result of body mass index data is used as the basis for categorizing the results of the Indonesian BMI classification. The results of the Indonesian BMI classification can be seen in the following table:

Table 2. Data Categories of body mass index

Total Value	Frequency	%	Classification
<17.0	0	0%	Skinny (Heavy)
17.0 – 18.4	1	7%	Skinny (Light)
18.5 – 25.0	14	93%	Normal
25.1 – 27.0	0	0%	Fat (Light)
>27.0	0	0%	Fat (Heavy)
Quantity	15	100%	

From **Table 2** shows that the body mass

index of the pencak silat athletes in Palopo who fall into the thin (heavy) category is 0 people or equivalent to 0%, the skinny category (light) is 1 person or equivalent to 7%, the normal category is 14 people or equivalent to 93%, 0 people in the fat (light) category or equivalent to 0%, in the fat (heavy) category as many as 0 people or equivalent to 0%.

The frequency distribution of the Body Mass Index of the Palopo pencak silat athletes can be seen in the following **Figure 1.**

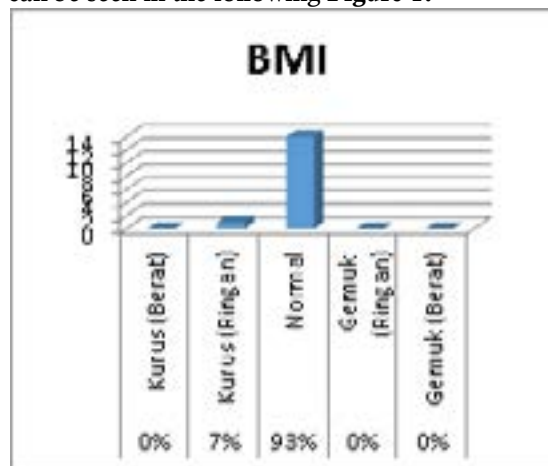


Figure 1. Distribution of BMI pencak silat frequency in Palopo City

Physical fitness

Results Descriptive calculation of physical fitness data is used as the basis for categorizing the results of physical fitness test norms. The results of the categorization of physical fitness test norms can be seen in the following **Table 3.**

Table 3. Data Categories of physical fitness

Total Value	Frequency	%	Percentage
22– 25	1	7%	Very well
18– 21	11	73%	Well
14– 17	3	20%	Currently
10– 13	0	0%	Not enough
5 – 9	0	0%	Less once
Quantity	15	100%	

From the **Table 3** above, it is known that the physical fitness of the palopo pencak silat athletes who are included in the very good category is 1 person or equivalent to 7%, the good category is 11 people or equivalent to 73%, the moderate category is 3 people or equivalent to 20%, the category less than 0 people or equivalent to 0%, very less category as many as 0 people or equivalent to 0%.

The frequency distribution of the physical

fitness of the Palopo pencak silat athletes can be seen in the following **Figure 2**.

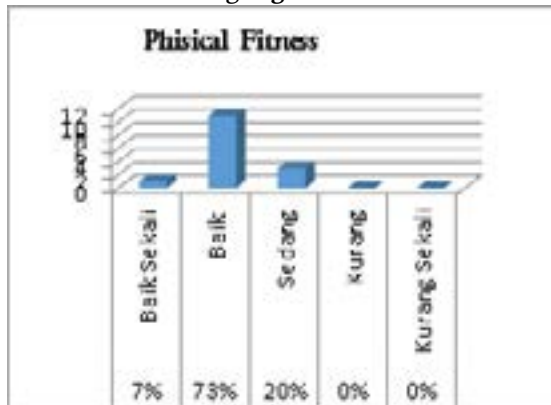


Figure 2. Distribution frequency off physical pitness of pencat silatt athleteessin Palopo

Normality test

The analytical requirements that must be met for the application of statistical techniques in processing this research data are the normality of the sample distribution. Basically the research data to be analyzed statistically, must meet the provisions of the analysis, especially the normality of the sample distribution. This is intended to determine that the data from the variables involved are normally distributed. The technique of testing the normality of the sample distribution used is the Shapiro-Wilk analysis. Clearly the results of the Shapiro-Wilk analysis can be seen in the appendix, while the summary of the calculation results is listed in the following **Table 4**.

Table 4. Summary of Normality Test Results

Variable	Probability Value (Sig)	Note:
Body mass index	0.768 0.05	Normality of spark plug test results normal
Physical fitness	0.127 0.05	Normal

Based on **Table 4** which is a summary of the results of testing the normality of the data on each research variable, it can be described as follows:

Testing the normality of body mass index data obtained a probability value = 0.768 greater than the value of $\alpha = 0.05$. Thus the body mass index data obtained are normally distributed.

Testing the normality of physical fitness data obtained a probability value = 0.753 which is greater than the value of $\alpha = 0.05$. Thus the physical fitness data obtained are normally distributed.

Based on the results of the analysis of the

normality test, it shows that the data obtained are normally distributed. Therefore, the conditions for the analysis of the data of this research variable have been fulfilled.

Hypothesis testing

The hypothesis in this study will be tested as follows:

From the results of the regression analysis between Body Mass Index and physical fitness in pencak silat athletes in Palopo city, the standard value of the beta coefficient (β) of 0.803 and the value of $t = 4.856$ ($\text{sig} = 0.000$). Based on these values, it can be stated that there is a positive and significant contribution between Body Mass Index and physical fitness in pencak silat athletes in Palopo city.

This means that reducing the time for better physical fitness will increase body mass index. The magnitude of the coefficient of variance determinant (R^2) is 0.645 which means that the body mass index has a contribution to physical fitness in pencak silat athletes in Palopo city by 64.5% and the remaining 35.5% is influenced by other factors.

Table 5. Correlation test calculation results Correlations

		BMI	Physical fitness
BMI	Pearson Correlation	1	.803**
	Sig. (2-tailed)		.000
	N	15	15
Physical fitness	Pearson Correlation	.803**	1
	Sig. (2-tailed)	.000	
	N	15	15

Based on **Table 5**, it can be seen that the results of the correlation test for BMI and physical fitness data with a sample of 15 athletes obtained a person correlation value of BMI 1 and physical fitness 0.803. While the results of the correlation test for physical fitness data with a sample of 15 athletes obtained a person correlation value of BMI 0.803 and physical fitness 1.

CONCLUSION

Based on the data analysis and discussion, the results of this study can be concluded as follows: The level of Body Mass Index of pencak silat athletes in Palopo City is in the normal category of 93%. The athletes from Palopo pencak silat have a strong degree of physical fitness, with

a score of 73%. Body mass index (BMI) has a 64.5% contribution to physical fitness in pencak silat athletes in Palopo City.

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