

# Body Mass Index Profile of Physical Education Teacher Candidates

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**Abstract.** This study aims to analyze the Body Mass Index (BMI) of PE teacher candidates of Sriwijaya University during the Covid-19 pandemic. A survey used as the research method (n=159). The data was collected by measuring the height and weight of the candidates, and the BMI was calculated using the formula of body mass divided by the square of the height in kg/m<sup>2</sup> units. The quantitative data analysis that was used in this study was the percentage of the candidates to map the physical fitness profile based on the BMI. The result of this study shows that the BMI of the candidates were as follows: underweight 28 (17,61%); normal or healthy weight 123 (77,36%), overweight 8 (5,03%). The underweight and overweight candidates are suggested to evaluate and improve their physical activity and nutrition in order to make their physical fitness better and their body weight ideal.

**Keywords:** BMI, PE teacher candidates.

## 1 Introduction

Physical education (PE) is an important part of education holistically, which aims to improve some aspects of students' life through physical activities that are planned systematically to achieve education goals. However, the main aspect which developed through physical activity in physical education is physical fitness, because physical activity encourages students to use their bodies actively and sustainably. Physical activity has been documented to have many benefits among students [1], [2]. The benefit of physical fitness on resilience is in part based on the recognition that physical fitness, achieved through physical activity and/or regular exercise, can induce positive psychological benefits, protect against the potential consequences or stressful events, and prevent many chronic disease [3]. Physical fitness is an important indicator of healthy status in children and adolescents, and certainly a good predictor of health status in life [4].

In an educational context, students identify teachers as role models who play an important role in their learning processes [5]. PE teachers require to be fit as the role model of students. A positive role-model that facilitates learning healthy life skills can be developed in a physical education setting [6]. When students see PE teacher in a good shape and practicing healthy lifestyle, they are more likely to want to be fit or practice those healthy behaviors themselves. Ironically, while PE teachers need to fit, previous studies found that some PE teachers deficiencies in physical activity and health-related fitness content knowledge [7], [8]. Without

sufficient knowledge, it will be more difficult for PE teachers to maintain fitness, let alone teach students practicing healthy lifestyle.

Undergraduate students, whose major is Physical Education, are PE teacher candidates. The students are projected to be PE teachers in the future by studying various aspects related to health science, sports training, sports coaching and other social sciences. While studying, they are also expected to be fit and maintain their physical fitness. The habit of living healthy is one of important factor the undergraduate students must have because they will be the role model of their future students. Although the students are expected to be fit, a previous study shows that more than 20% undergraduate PE students in overweight or even obesity category [9].

Sriwijaya University is one of state university in Indonesia that has PE major under the Physical Education, Health, and Recreation study program. There are several practical courses (e.g. Basic Basketball Skill, Basic Volleyball Skill, Basic Athletic Skill, etc.) that expected to help maintaining or even improving the undergraduate PE students of Sriwijaya University body mass index (BMI) level. The problem is that during this Covid-19 pandemic there are no practical class and all of classes have been being done online. As schools and universities were ordered to close to contain the spread of the coronavirus, traditional physical classes were transitioned to an online mode of learning. PE centers on physical activity and is clearly distinct from general knowledge-based subjects [10], therefore, online practical learning effectiveness still needs to be tested.

This study aims to analyze the BMI of PE teacher candidates, during the Covid-19 pandemic. The teacher candidates are the undergraduate students of Sriwijaya University Physical Education, Health, and Recreation study program, that still undergoing practical courses using multiple online based learning.

## **2 Method**

The research method used in this study was survey method. 159 (97 male and 62 female) undergraduate students of Sriwijaya University Physical Education, Health, and Recreation study program participated in this study through an accidental sampling. The data was collected by measuring the height and weight of the candidates. The measurement was done gradually under covid-19 health protocol. BMI was calculated using the formula of body mass divided by the square of the height in kg/m<sup>2</sup> units. The quantitative data analysis that was used in this study was the percentage of the candidates to map the physical fitness profile based on the BMI.

## **3 Results**

The results which show the overall BMI level of PE teacher candidates in Sriwijaya University Physical Education, Health, and Recreation study program, both male and female can be seen in Table 1.

**Table 1.** Weight and height of teacher candidates

Data	Male		Female	
	Mean	St.Dev	Mean	St.Dev
N	97		62	
Age	20,38	1,25	19,97	0,96
Weight (kg)	60,85	8,29	52,39	5,89
Height (m)	169,26	5,38	158,35	5,70
BMI (kg/m <sup>2</sup> )	21,20	2,38	20,89	2,03

Table 1 shows that male PE teacher candidates have a greater body weight, body height and BMI than female candidates. Based on the data in table 1, the physical education teacher candidates in Sriwijaya University Physical Education, Health, and Recreation study program during the Covid-19 pandemic, as follows: The BMI of male PE teacher candidates average is 21,20 kg/m<sup>2</sup> which is in the normal category, while the status of the average female candidates is 20,89 kg/m<sup>2</sup> which is also in the normal category (healthy weight).

The detailed profile data of BMI categories for all male and female subjects can be seen in Table 2.

**Table 2.** BMI category of teacher candidates

Category	Frequency	Precent
Underweight	28	17,61
Normal	123	77,36
Overweight	8	5,03
Obese Class I (Moderately Obese)	0	0
Obese Class II (Severely Obese)	0	0
Obese Class III ( Very Severely Obese)	0	0
Total	159	100

Table 2 shows that the BMI of physical education teacher candidates in Sriwijaya University Physical Education, Health, and Recreation study program during the Covid-19 pandemic. There were 123 (77,36%) subject were normal (healthy weight), 28 (17,61%) subject were underweight, and 8 (5,03%) subject were overweight.

## 4 Discussion

PE teacher candidates will certainly become the role models for their students in the future, including in terms of ideal body shape as an example of a healthy lifestyle [11], because one of the task of the PE teachers is teaching about the application and habits of healthy living. Covid-19 pandemic is striking all over the world, and this has certainly reduced people's physical activity. If the physical activity decreases, the level of physical fitness also decreases and of course people will have a hard time to control their body weight. In addition, body mass index

(BMI) is an important factor affecting the level of cardiovascular fitness. Fitness is calculated per unit body weight, thus increasing body fat means decreasing fitness level [12], [13].

The ideal BMI can be obtained by adopting habits of active and healthy living, such as diet planning, balancing nutritional intake, and doing adequate physical activity. A general recommendation for adults to be physically active is to achieve at least 150 minutes of moderate-intensity exercise or 75 minutes of vigorous-intensity exercise per week or a combination of both types [14], [15]. Likewise, there is general concern about the negative health implications of physical inactivity and sedentary behavior [16]. Sedentary behavior is defined as any everyday behavior that is practiced while lying down, sitting or standing, which involves energy expenditure  $\leq 1.5$  metabolic equivalents [17], [18].

Obesity is recognized as an important risk factor for various diseases. Previous studies shown an increase in all causes of mortality with an increase in BMI, especially the mortality from cardiovascular disease in men [19]. The prevalence of obesity in children and adolescents is increasing along with changes in socio-economic environment and lifestyle patterns [20]–[22]. Obesity in children is assumed to be related to the risk of obesity and other diseases, such as type II diabetes mellitus or cardiovascular disease. BMI has been considered as an indicator of obesity and is widely used as a screening method for obesity because it is a well-known index for predicting obesity and assessing health risks. High BMI level in childhood will effect the life in adulthood which associate with obesity and high blood pressure [23], [24], and a higher risk of various diseases such as type II diabetes mellitus, stroke, heart attack, atherosclerosis and total mortality (25,26).

The research data shows that from all the participating PE teacher candidates ( $n = 159$ ), the majority (77.36%) are in the normal BMI category while the rest are in the underweight (17.61%) and overweight (5.03%) categories. This could be due to the maintained physical activity of the PE teacher candidates even though they are still in the Covid-19 pandemic condition. Although lectures, both theory and practice, are carried out online, several activities of the PE teacher candidates, who are students of the Physical Education Study Program of Sriwijaya University, are still actively carried out. Student activities such as the *Penjas Bicycle Community* and the *Balbalan Penjas* are still active, which are shown in the updated photos on these activities' social media. Even though these activities are actively running, they are not official university activities, so there are no restrictions in implementing them as long as the students still follow the applicable health protocols. These activities are suspected to be the cause of the majority of the PE teacher candidates' normal BMI category. Meanwhile, the PE teacher candidates who are in underweight category are suspected of not meeting nutritional needs or have an ectomorph body type, so it is quite difficult to increase body weight without good nutrition and/or doing weight training, while the PE teacher candidates who are in overweight category are suspected to be less active in participating in activities that are involves physical activity or not maintaining their nutritional balance.

In this study, the level of physical activity and passive activity, or the nutritional intake of the research subjects was not measured, so that the causative factor from the BMI image obtained from this study was unknown. Even so, this research can be used as an initial description to be used as a minimum standard in recruiting students (teacher candidates), especially PE teacher candidates.

## 5 Conclusion

General description of the BMI of PE teacher candidates, who are currently studying at the Sriwijaya University Physical Education, Health, and Recreation study program, is the absence of the obesity category and a small proportion (17.61%) in the underweight category. This must be evaluated individually, both in diet and physical activity, so that the BMI turn into the normal category, and those that have entered the normal category still have to maintain their healthy patterns and habits, so that they are not prone to disease.

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