



## The Body Mass Index Profile of PE Teachers in Semarang City during the Covid-19 Pandemic

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### Abstract

The Covid-19 pandemic requires teachers and students to carry out online learning. This has an impact on physical education subject. It definitely reduces the physical activity in which physical education, sports and health requires physical activity as a medium of learning. The lack of physical activity has a negative effect on health and physical fitness. This study aims to analyze the physical fitness of Physical Education Teachers (PE Teachers) in Semarang City during the Covid-19 pandemic based on the Body Mass Index (BMI). The research method used was a survey, the research sample was 186 PE Teachers in Semarang. The data collection was gained by the measurements of height and weight. BMI is calculated using the formula of the body mass divided by the square of the body height in units of kg/m<sup>2</sup>. The quantitative data analysis used in this study was the percentage to describe the physical fitness profile based on BMI. The results of the study showed that the BMI of Semarang City PE Teachers during the Covid-19 pandemic were as follows: underweight 7 people (3.76%); normal or healthy weight 115 people (61.83%), overweight 56 people (30.11%), obese 8 people (4.30%). The conclusion of the physical fitness of PE Teachers in Semarang City during the Covid-19 pandemic based on body mass index were categorized as follows: the underweight were 7 people (3.76%), normal or healthy weight were 115 people (61%), overweight and obese were 64 people (34.41%). The suggestions for PE Teachers whose category are underweight, overweight and obese based on BMI is to evaluate and improve their lifestyle, diet and physical activity so that their body weight becomes normal or ideal and their physical fitness is getting better. For those who acquired normal category, it means they have been having a good lifestyle.

### How to Cite

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## INTRODUCTION

Physical fitness is a dynamic healthy degree and a person's quality in doing activities according to their job optimally without causing health problems and excessive fatigue. Physical fitness can be defined as a person's ability to carry out daily activities effectively and efficiently on tasks that must be carried out. The condition of a person's physical fitness is dynamic and is influenced by various factors, including lifestyle, nutritional status, environment and habits. Physical fitness is an important component that can be developed through physical education. One of the important components of physical fitness is cardiovascular and respiratory fitness, also known as cardiorespiratory fitness (Budayati, 2011; Prabowo, 2014; Giriwijoyo & Sidik, 2010; Ma'mun & Setiawan, 2015; Riyoko & Artikel, 2014; Prasepty et al., 2017).

The body health and physical fitness are important aspects for everyone, especially during the Covid-19 pandemic like today. The World Health Organization (WHO) has established the status of Covid-19 as global pandemic after this dangerous virus spread to most parts of the world including Indonesia. It spreads very quickly and is deadly. (Syafrida & Hartati, 2020; Supriatna, 2020).

Good health, physical fitness, and endurance are the best for tresses to deal with the Covid-19 outbreak. One of the ways to maintain health and physical fitness is by doing physical activity or exercising regularly. Sports activity has been shown to affect cytokines in the body. Cytokines are elements that can affect almost all immune function and help stimulate the growth of immune cell types. The most common cytokines are interleukins which can increase as a result of sports activities. This cytokine is closely related to the immune system because it can protect the body from viral infections and tumors (Hariadi, 2009; Sinuraya & Barus, 2020; Devy Amelia Nurul Alamsyah et al., 2017).

Physical health and fitness are very important to be developed in the family environment, society, and at school. A physical education teacher plays an important role in motivating students to do sports activities. Learning physical education, sports and health (PESH) which is done remotely becomes ineffective when students are not motivated to do physical activity. PE Teachers need to maintain physical health and fitness for themselves and their students. However, the fact is that the Covid-19 pandemic requires teachers and students to carry out online learning. This has an impact on physical education, sports and

health (PESH) subjects since this subject requires physical activity as a learning medium. The lack of physical activity has a negative effect on physical fitness.

PESH subject is more complex in terms of problems than other subjects, because PESH contains material about theory and practice. In general, the physical education teacher profession is the same as teachers of other subjects, but in particular it has differences which becomes its own characteristic. Therefore, the PE Teachers as paragon and role models for their students must be able to maintain their health and physical fitness.

Health maintenance and improvement of physical fitness for PE Teachers need to be fostered to support the achievement of an optimal teaching process. If the Physical Education teacher has good health and a level of physical fitness, then he will be able to perform his teaching obligations well. However, if the physical education teacher has poor health and physical fitness, it can certainly interfere the teaching process. It causes the students cannot learn optimally. During a pandemic like this it is very important to do physical activity or sports so that the PE Teachers have good health and physical fitness because health and physical fitness can encourage PE Teachers to be more enthusiastic and become more concentrated in providing learning material to students, besides it can also avoid the transmission of the Covid-19 virus.

Good physical fitness is an indicator of a good dynamic health level. The level of health and fitness of a person can be seen through the ideal body weight. A person is said to have an ideal size if his body shape looks compatible between weight and height, that is, neither too fat nor too thin. A person can be assumed to have an ideal body weight when he/she has a normal amount of fat percentage. Ideal body weight becomes an indicator of a person's fitness, one of which can be seen from the BMI. BMI is an important factor that can affect the level of cardiovascular fitness (Budayati, 2011; Andrastea et al., 2018; Yusa & Wiriawan, 2018; Lubis et al., 2015)

Body mass index (BMI) is a value derived from the body mass (weight) and height of a person. The BMI is defined as the body mass divided by the square of the body height, and is universally expressed in units of kg/m<sup>2</sup>, resulting from mass in kilograms and height in metres

Based on the background of the problem, the problem statement in this study is how the Body Mass Index profile of PE Teachers in the city of Semarang during the Covid-19 pandemic. The purpose of this study was to analyze the Body

Mass Index profile of PE Teachers in Semarang City during the Covid-19 pandemic.

## METHOD

This research used a quantitative approach with a survey method. The research subjects were 186 PE Teachers in Semarang City who volunteered to be the research sample, consisting of 155 men and 31 women. Their average age was 32 years. The data was collected from June-August 2020.

The research instruments used in this study were: (1) a meter to measure height; (2) Scales for measuring body weight; (3) The formula for calculating BMI

$$\text{BMI} = \text{Body mass (kg)} / \text{Body height (m)}^2$$

The results of the above calculations are then matched with table 1. BMI categories for Indonesia.

**Table 1.** BMI Category

Category	BMI (kg/m <sup>2</sup> )	
	From	to
Very severely underweight		15
Severely underweight	15	16
Underweight	16	18.5
Normal (healthy weight)	18.5	25
Overweight	25	30
Obese Class I (Moderately obese)	30	35
Obese Class II (Severely obese)	35	40
Obese Class III (Very severely obese)	40	

(WHO, 2004)

## RESULTS AND DISCUSSION

The results which showed the overall BMI level of PE Teachers in Semarang City, both male and female can be seen in **Table 2**.

**Table 2.** The Characteristic of the research subjects

Data	Male		Female	
	Mean	SD	Mean	SD
Age	31.26	9.14	33.58	12.61
Weight (kg)	70.52	17.59	59.81	8.94
Height (meter)	168.34	9.99	158.45	6.56
BMI (kg/m <sup>2</sup> )	26.51	5.21	23.82	3.03

(Source: the results of the study)

**Table 2** shows that male PE Teachers have a greater body weight, body height and BMI than female PE Teachers. Based on the data in table 2, the physical education teacher in Semarang City during the Covid-19 pandemic, as follows: The BMI of male PE Teachers average 26.51 kg/m<sup>2</sup> are in the overweight category, while the status of the average female PE Teachers average 23.82 kg/m<sup>2</sup> is in the normal category (healthy weight)

The detailed profile data of BMI categories for all male and female subjects can be seen in **Table 3**

**Table 3.** Frequency Distribution of the Body Mass Index (BMI)

Category	Frequency	Percent
Underweight	7	3.76%
Normal (healthy weight)	115	61.83%
Overweight	56	30,11%
Obese Class I	8	4,30%
Total	186	100%

(Source: The Result of The Study)

**Table 3** shows that the BMI of Semarang City PE Teachers during the Covid-19 pandemic . There were 115 (61.83%) people were (healthy weight), 7 (3.76%) people were underweight, and 64 (34.41%) people were overweight and moderately obese (obese class 1).

During the Covid-19 pandemic, PESH learning in schools could not be carried out directly, but carried out online from home. This situation definitely reduced physical activity of PE Teachers who have to prepare, implement, and evaluate learning PESH virtually. The lack of physical activity has a negative effect on physical fitness, which can be seen through BMI. The lack of physical activity can lead to low body metabolism and reduced the energy used. If the food or energy intake is greater than the energy used, the excess energy will be stored by the body in the form of fat, resulting in weight gain and the increasing of BMI which lead to overweight and obese. The result of this lack of movement not only affects BMI, but can also cause the decrease of physical fitness and general health conditions.

The results of this study indicated that 61.96% of the study subjects have ideal or normal body weight (healthy weight). Meanwhile, 34.79% of the subjects are overweight and moderately obese. It certainly provides information that their nutritional needs are fulfilled, but the needs for physical activity is not sufficient. In addition, body mass index (BMI) is an important factor affecting the level of cardiovascular fitness.

Fitness is calculated per unit of body weight, so then the body fat increases, the fitness will decrease (Andrastea et al., 2018; Widiyanto, 2015)

**Table 4** The BMI and Health Risk

Health Risk	BMI (kg/m <sup>2</sup> )
Risk of developing problems such as nutritional deficiency and osteoporosis	Under 18.5
Low Risk (healthy range)	18.5 to 23
Moderate risk of developing heart disease, high blood pressure, stroke, diabetes	23 to 27.5
High risk of developing heart disease, high blood pressure, stroke, diabetes	Over 27.5

(WHO, 2004)

The consequences of elevated level BMI in adults, the BMI ranges are based on the relationship between body weight and disease and death. Overweight and obese individuals are at an increased risk for the following diseases: coronary artery disease, dyslipidemia, type 2 diabetes, gallbladder disease, hypertension, osteoarthritis, sleep apnea and stroke.

The ideal body weight can be obtained in various ways, one of which is by adopting a healthy lifestyle, eating regularly and sufficiently in both quantity and quality of nutrition, doing physical activity or exercise and adequate rest. Physical activity or regular exercise can increase the body metabolism, especially body fat burning so that it can help people to achieve an ideal body weight and healthier body (Widiyanto, 2015). One of the good physical activities or sports is low impact aerobic exercise, which is proven to have a significant effect on weight loss, body fat percent and cholesterol levels in obese patients (Galih Tri Utomo, 2012).

The WHO regards a BMI of less than 18.5 as underweight and may indicate malnutrition, an eating disorder, or other health problems, while a BMI equal to or greater than 25 is considered overweight and above 30 is considered obese. For many Asian populations, additional trigger points for public health action were identified as 23 kg/m<sup>2</sup> or higher, representing increased risk, and 27.5 kg/m<sup>2</sup> or higher as representing high risk. The suggested categories are as follows: less than 18.5 kg/m<sup>2</sup> underweight; 18.5–23 kg/m<sup>2</sup> increasing but acceptable risk; 23–27.5 kg/m<sup>2</sup> increased risk; and 27.5 kg/m<sup>2</sup> or higher high risk (WHO, 2004).

Cross-sectional studies indicated that se-

dentary people can decrease BMI by becoming more physically active. Smaller effects are seen in prospective cohort studies which lend to support active mobility as a means to prevent a further increase in BMI (Dons, 2018). WHO also recommends lowering the normal/overweight threshold for South East Asian body types to around BMI 23, and expects further revisions to emerge from clinical studies of different body types (WHO, 2004)

Regular physical activity is important for good health, and it's especially important trying to lose weight or to maintain a healthy weight. When losing weight, more physical activity increases the number of calories the body uses for energy or "burns off". The burning of calories through physical activity, combined with reducing the number of calories intake, creates a "calorie deficit" that results in weight loss. Most weight loss occurs because of decreased caloric intake. Most importantly, physical activity evidence shows the only way to maintain weight loss is to be engaged in regular physical activity. reduces risks of cardiovascular disease and diabetes beyond that produced by weight reduction alone. (<https://www.cdc.gov/physicalactivity/index.html>)

Physical activity helps the body feel better, function better, and sleep better, its also reduces anxiety. Benefits of physical activity are: lower risk of early death, coronary heart disease, stroke, high blood pressure, high cholesterol or triglycerides, type 2 diabetes, metabolic syndrome, colon cancer, breast cancer, and physical activity are prevention of weight gain, weight loss (particularly when combined with reduced calorie intake), improved cardiorespiratory (aerobic) fitness, muscular strength, and reduced depression. It is recommended that all adults should undertake regular physical activity. Adults should do at least 150– 300 minutes of moderate-intensity aerobic physical activity; or at least 75–150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate and vigorous-intensity activity throughout the week, for substantial health benefits. For additional health benefits, adults should also do muscle strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week, as these provide additional health benefits (WHO, 2020).

## CONCLUSION

The conclusion of the physical fitness of PE Teachers in Semarang City during the Co-

vid-19 pandemic based on BMI can be explained as follows: 7 (3.76%) people were underweight, 115 (61.83%) people were normal (healthy weight), and 64 (34.41%) people were overweight and obese.

The suggestions for the PE Teachers whose BMI categories were underweight, overweight, and obese is to evaluate and improve their lifestyle, diet, and physical activity so that their normal or ideal weight and physical fitness becomes better. Meanwhile, for those whose BMI category were normal is to maintain their good lifestyle.

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