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Comparison of Body Mass Index of 2022 A Students of Banyuwangi PGRI University Based on Soccer, Volleyball, and Pencak Silat Martial Arts

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Abstract

This study aims to analyze the comparison of body mass index (BMI) of PGRI Banyuwangi University students in class 2022A based on the sports they participate in. This research uses comparative descriptive research with a quantitative approach. The research sample was 2022A students of PGRI Banyuwangi University who played various sports such as volleyball, soccer, and pencak silat. BMI data was collected by directly measuring the participants' weight and height and calculated using the BMI formula. Data analysis is descriptive. The results showed that there were significant differences in BMI between students in different sports. Students who participate in more physically demanding sports, such as soccer and volleyball, tend to have a lower BMI than those who participate in less physically demanding sports, such as Pencak Silat. These findings provide an important insight into the impact of exercise on the nutritional status and physical fitness of university students.

Keywords: body mass index; athletes; volleyball; soccer; pencak silat

INTRODUCTION

Body Mass Index is a standardized parameter for assessing a person's weight. BMI is one of the references needed to see the composition of a person's health and nutritional status based on its classification. Calculating body weight in kilograms (kg) and dividing by height in meters squared (m2) will produce a body mass index result classified in kg/m2). According to Wiranata & Inayah (2020) Body Mass (BMI) is body weight in kg divided by the square of height in meters, the Body Mass Index (BMI) is one of the most commonly used ways to estimate whether someone is overweight or may have health problems. According to Jauza et al., (2022) Body Mass Index (BMI) is one of the references for categorizing body weight composition. It is used because for most people it correlates quite well with body fat levels. Body Mass Index (BMI) is also a relatively easy, cheap, and non-invasive method. According to Hasibuan & Palmizal (2021), Body Mass Index (BMI) is a simple tool to be able to helps each individual in monitoring the status of body condition and is closely related to excess or underweight. Body Mass Index (BMI) is a simple way to see if a person is overweight or underweight). Therefore it is necessary for an athlete to maintain an Ideal Body Mass Index. To have an ideal BMI, a person usually has to exercise regularly and regulate their diet.

Sport is basically a series of movements that are planned and carried out regularly to maintain and improve one's ability to move (Komalasari & Budi,

2024). Exercise as part of healthy living behavior is part of physical activity consisting of planned, structured, and repetitive movements performed for the purpose of improving or maintaining health and physical fitness. The term sports training or physical exercise is often used interchangeably with the term physical activity. Therefore, exercise and Body Mass Index are two things that are very related, especially for an athlete who is always eyeing achievement. According to Wibowo & Hakim (2019) to get the optimal condition of athletes, one simple way can be seen through the body mass index of an athlete. So it is very important to maintain Body Mass Index for athletes and sportsmen. If athletes' Body Mass Index is not maintained, it will greatly affect their fitness components such as speed, agility, and strength (Primasoni, 2022).

Basically, all sports require physical fitness components, namely speed, agility, and strength. Therefore an athlete must have these physical components in accordance with the sport. Usually, physical components such as agility are needed in team sports such as soccer. Pranata (2017) said Football is one of the sports that involves all limbs and requires agility to get past its opponents. Therefore a soccer athlete needs an ideal body mass index. According to (Mahfud et al., 2020) soccer is one of the game sports that requires having an ideal Body Mass Index. An athlete who has less and excessive body weight will affect his appearance in performing a technique in sports.

Not only soccer, in other team games such as volleyball also require a physical component, namely agility. Agility is always used in every sports game including soccer, basketball, volleyball, table tennis, softball, baseball, dynasty, hockey, and so on (Kasidu et al., 2021). To get maximum agility an athlete must have an ideal body mass index. Body Mass Index has an important role as one of the parameters in the selection and development of volleyball athletes. Body Mass Index measurement has become an important priority in the sport of volleyball. (Kusnandar et al., 2020) Also said that volleyball is closely related to the level of Body Mass Index (BMI) owned by athletes because ideal BMI will affect ideal anthropometry.

In addition to game sports, martial arts sports also really need an Ideal Body Mass Index. Body Mass Index (BMI) will affect every physical activity in sports training activities, especially for martial arts athletes. This is influenced by each physical activity requiring different energy according to the body weight or Body Mass Index (BMI) of each athlete (Muti, 2015). Pencak silat is a martial art that considers body weight before competition. According to (Pratiwi et al., 2023) Weight and height are also very influential in pencak silat matches because in martial arts if there is a large difference between body weight and height, there will be a gap and an unfairness in a match. This weight problem often occurs in martial arts athletes who partly use body weight classifications. This weight problem must receive serious attention from the coaches, as well as the awareness of athletes who are overweight because it will greatly affect their achievements (Faizal & Hadi, 2019).

Based on data analysis, researchers are interested in analyzing the Body Mass Index as research material. Body Mass Index itself is an indicator that is often used to assess whether someone has an ideal weight based on their height. Comparison of Body Mass Index can be seen from several aspects, namely physical condition, health, counseling, and education. BMI is strongly related to

physical balance, long-term health potential, and optimal sports performance. So this research is very relevant to find out the comparison of 2022A students of PGRI Banyuwangi University who not only focus on academics but are also active in sports activities.

METHOD

This type of research uses quantitative descriptive research. This research was conducted at PGRI Banyuwangi University. The population used consisted of 19 students of class 2022A who were involved in the sports of volleyball, soccer, and pencak silat which represented a number of representative groups. Sports, sampling techniques using simple random sampling, data measurement techniques using tools such as scales and stadiometers, and data analysis using the body mass index (IMT) formula and IMT nutritional status categories as follows:

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)}^2}$$

Table 1. Nutrition Status Categories according to WHO

Classification	BMI
Underweight	< 18,5
Normal weight	18,5 – 22,9
Overweight	23 – 29,9
Obese weight	> 30

RESULT

The results of data collection and the research results can be presented in the table below:

Table 2. BMI measurement results of UNIBA 2022A male students

Student Name	BMI	Sports	Category
I'm	26,75	Volly Ball	Normal
Zn	20	Volly Ball	Normal
Gy	21,45	Volly Ball	Normal
Fi	24,21	Volly ball	Excess
Nl	22,97	Volly ball	Normal
Agile	26,75	Football	Normal
Wu	24,31	Football	Normal
Iq	28,30	Football	Excess
Dz	23,02	Pencak Silat	Excess
Ao	23,64	Pencak Silat	Excess
Aa	23,64	Pencak Silat	Excess

From the data above, it is known that in the Body Mass Index of UNIBA 2022A male students, there are 6 in normal categories and 5 people in the excess category.

Table 3. IMT measurement results of UNIBA 2022A female students

Student Name	BMI	Sports	Category
Ra	20,70	Volley Ball	Normal
Ea	20,09	Volley Ball	Normal
Ei	18,56	Volley Ball	Less
Ta	21,17	Football	Normal
Al	24,89	Pencak Silat	Excess
Ek	20,61	Pencak Silat	Normal
Bs	21,21	Pencak Silat	Normal
Na	17,7	Pencak Silat	Less

From the data above, it is known that in the Body Mass Index of UNIBA 2022A female students, there are 5 with normal categories 1 person in the excess category, and 3 people have normal body mass index.

Table 4. IMT measurement results of UNIBA 2022A students who take part in volleyball sports

Student name	BMI	Category
I'm	26,75	Normal
Zn	20	Normal
Gy	21,45	Normal
Fi	24,21	Excess
Nl	22,97	Normal
Ra	20,70	Normal
Ea	20,09	Normal
Ei	18,56	Less

From the table data above, there are 8 students who take part in volleyball sports and it is known that there are 6 people who have normal body mass index categories, 1 person in the excess category, 0 in the obese category, and 1 person in the deficient category. Has a percentage of 75% which is included in the normal category, 12.5% excess category, 0% obesity, and 12.5% less.

Table 5. IMT measurement results of UNIBA 2022A students who take part in soccer sports

Student name	BMI	Category
Ag	26,75	Normal
Wu	24,31	Normal
Iq	28,30	Excess
Ta	21,17	Normal

In the soccer sport, there are 4 people with normal body mass index categories as much as 1, 3 excess categories, and no one is categorized as less or obese. Has a percentage of 25% in the normal category, 75% excess, 0% obesity, and 0% in the less category.

Table 6. IMT measurement results of UNIBA 2022A students who take part in Pencak silat sports

Student Name	BMI	Category
Al	24,89	Excess
Ek	20,61	Normal
Bs	21,21	Normal
Na	17,7	Less
Dz	23,02	Excess
Ao	23,64	Excess
Aa	23,64	Excess

In the martial arts sport of pencak silat, there are 7 students who take part in this sport with 2 people in the normal category, 4 people in the excess category, 1 person in the less category, and no one in the obese category. If described in percentage, 28.57% are in the normal category, 57.1% are overweight, 0% are obese and 14.2% are in the less category.

DISCUSSION

After knowing the results of the calculation, it can be seen that the volleyball sport has a percentage of 75% with a Normal Body Mass Index while the other 25% fall into the less and excess categories, this is in line with the statement (Kusnandar et al., 2020) In volleyball sports, it is closely related to the level of Body Mass Index (BMI) owned by athletes because ideal BMI will affect ideal anthropometry. If volleyball athletes have a Body Mass Index that is not ideal, it will be difficult to perform basic techniques when playing the game, one of which is the basic technique that requires an athlete to jump. As said (Abdillahtukhaer, 2016) someone with an excessive BMI will reduce the height of the jump because when doing the movement not only gravity aggravate the movement but the body mass provides an additional force that provides a burden when doing the movement.

Meanwhile, in the soccer branch, UNIBA class 2022A students have an ideal BMI percentage of only 25% while the other 75% have a BMI that is not ideal, divided into less and excess categories. According to Mahfud et al., (2020), soccer is one of the game sports that requires an ideal Body Mass Index. Meanwhile, according to Ananda et al., (2022) The body composition of a perfect soccer athlete, is if the athlete has a proportional composition of muscle mass and fat, body height exceeds the average, and has a normal body mass index (BMI) category This shows that the Body Mass Index of UNIBA students in class 2022 A is inversely proportional to the statement made by Mahfud et al because the ideal BMI is needed in soccer sports because it requires agility and speed in the game.

In pencak silat sports, UNIBA students in class 2022A have a Body Mass Index percentage of 28.57% in the normal category, while 71.3% are in the abnormal category. While martial arts pencak silat must have an ideal Body Mass Index as said (Muti, 2015) Body Mass Index (BMI) will affect every physical activity in sports training activities, especially for martial arts athletes. (Dewi & Santika, 2020) Argues that in order for pencak silat athletes to move quickly and agilely, it will not be separated from the name of body weight and leg muscle

strength. These results and these statements are inversely proportional because martial arts pencak silat also requires an ideal Body Mass Index to maximize its technical techniques in a competition.

CONCLUSION

Based on the results of the study, it can be concluded that there are significant differences in body mass index (BMI) between volleyball players, soccer players, and martial arts players of PGRI Banyuwangi University Batch 2022A. Volleyball and soccer athletes have lower BMIs and are healthier thanks to regular and intense physical activity. On the other hand, pencak silat tend to have a higher BMI, which may be due to a lack of physical activity and a sedentary lifestyle. To maintain a healthy BMI and reduce the risk of weight-related health problems, encourage students, especially those with low physical activity levels, to exercise more regularly and maintain a healthy lifestyle.

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