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Correlation between Body Mass Index and Student Achievement

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Abstract: ***This study aims to determine the body mass index condition; academic achievement and the relationship between both to the students. The research method was correlational descriptive and used Product Moment method to obtain a correlation value. The researcher concluded that the physical factors of students as measured by body mass index affect learning achievement. Students' attention to the learning process that regulates the aspects of cognitive, affective and psychomotor can achieved with the student fitness. The students should concern their body mass index in standard category and avoid the obesity.***

Keywords: Body Mass Index, Students' Achievement

1. Introduction

Physical fitness is a state a person possesses or achieves about the ability to perform physical activity [1], [2]. Physical fitness is related to health when a physical operation can perform without excessive fatigue, is preserved for life and consequently has a lower risk for early chronic disease [3]. A person who is physically fit can perform his daily physical activities diligently, have little chance of health problems and can enjoy sports as well as various other events [4], [5].

Learning achievement is the assessment of the learning activities and reflects the student achievement in a specified period. These performances may take the form of behavioral changes that include the cognitive, affective, and psychomotor domains [6]. Measurement of learning achievement aims to reveal the problems of the learning process as well as the basis for the formulation of the development of learning models.

In general, two factors affect learning achievements are internal factors and external factors. Internal factors include physical factors such as health and disability, psychological factors such as intelligence, talent, motivation and readiness to learn and fatigue factors [7]. Externally or external elements of the individual include the support of parents, the condition of the school and the teacher as well as the conditions of society such as associate friends, and life forms of community. This value is an alternative to the body fat measurement action divided into four categories namely thin, regular and obesity. This value differs between women and men. Body mass index is related to age, Gender, Genetic, Diet and Physical Activity.

Various studies related to the relationship of physical condition with learning achievement. The status of obesity and physical inactivity has implications for cognitive function and adolescent academic performance. [8]. Conversely, for children who have increased weight or increased body fat contribute to student educational development. However, the increase in pressure is still within reasonable limits [9].

Achievement can influence by several factors, one of which is physical fitness. In adolescence, physical fitness is less of a concern. According to [10], physical fitness is the ability to perform daily activities with a vigilant and full of vigilance without experiencing significant fatigue. Components of physical fitness that can use as indicators include strength (strength) and speed (speed). Physical fitness is used to support physical work activities that ultimately are expected to improve learning achievement.

Body Mass Index can also be used for the assessment of obesity that has links to several health conditions such as cardiovascular, metabolic, pulmonary, skeletal, and psychosocial disorders [11], whereas adolescence is a period of rapid growth, and there is a drastic change in body composition that, if not controlled can cause obesity.

Research by [12], children aged 12-14, from the 60% Association Committee on the Standardization of Physical Fitness Test (ACSPFT) subjects had less physical fitness levels. No one subject has an excellent physical fitness level. Most boys have a physical fitness level of less than 58.7%, as well as girls who mostly have a physical fitness level of less than 61.8%.

The learning achievement of Schoolchildren in Spain is positively related to the level of fitness. Boys with excessive weight have lower academic achievement than boys of average weight. Is related to the level of cardio-respiratory which is the determinant of fitness [13].

The facts show that efforts to improve the fitness of students through exercise training have not been a significant concern for education in Indonesia. Sports exercise as one of the efforts to maintain or achieve ideal weight condition is considered to contribute to the achievement of good learning outcomes.

2. Method

This research method is a definite correlation. The independent variable is the body mass index which is the result of weight loss and height. Data collection through

weight and height measurement of students. Body mass index divided into four categories can be seen in Table 1.

Table 1: Body Mass Index Category

Category	*Men*	*Women*
Thin	< 20.10	< 18.70
Normal	20.10 – 25.00	18.70 – 23.80
Overweight	25.10 – 30.00	23.90 – 28.60
Obesity	> 30.00	> 28.60

Independent variable is the learning achievement found from the value of learning progress in odd semester 2016/2017 in the range of values between 1 - 4. There are five categories of learning outcomes can be seen in Table 2.

Table 2: Learning achievement categories

Category	*Value*
With compliments	More than 3.75
Very satisfactory	3.50 – 3.74
Satisfactory	3.25 – 3.49
Less satisfactory	2.99 – 3.23
Not satisfactory	Less than 2.98

The subjects of the study were 100 high school students in Jeneponto Regency of South Sulawesi Province, Indonesia. The sample size divided into 50 female students and 50 male students. Data analysis was done by Product Moment method to obtain correlation value between two variables with interpretation in Table 3.

Table 3: Interpretation of Coefficient Correlation

Interval of Correlation Coefficient	*Interpretation*
0.80 – 1.00	Very strong
0.60 – 0.79	Strong
0.40 – 0.59	Strong enough
0.20 – 0.39	Weak
0.01 – 0.19	Very weak

3. Result and Discussion

The body mass index for male and female students presented in Table 4 and Table 5.

Table 4: Body Mass Index Male Students

Category	*Frequency*	*Percentage (%)*
Thin	14.00	28.00
Normal	33.00	66.00
Overweight	3.00	6.00
Obesity	0.00	0.00

Table 5: Body Mass Index Male Students

Category	*Frequency*	*Percentage (%)*
Thin	12.00	24.00
Normal	38.00	76.00
Overweight	0.00	0.00
Obesity	0.00	0.00

The result shows that the body mass index condition dominated of the standard category. The male students and female student shows the similar situation. There were 66% male students with normal weight while 76% female student have standard body mass index. However, there three male students with excessive body mass or obesity.

3.1 Learning Achievement

The results showed that the achievement of male students in the category of competent as much as 23 people or 46.00% then there are 17 people or 34.00% included in the class is very satisfactory. These results indicate that male students show good learning outcomes and can see in Table 6.

Table 6: The learning achievement for male students

Category	*Frequency*	*Percentage (%)*
With compliments	3.00	6.00
Very satisfactory	17.00	34.00
Satisfactory	23.00	46.00
Less satisfactory	5.00	10.00
Not satisfactory	2.00	4.00

The learning outcomes of female students also show good achievement. Table 7 shows that there are 22 students (44%) with satisfactory categories and 19 (38%) with very satisfactory types. Furthermore, there are four students (8%) who show kind with a compliment.

Table 7: The learning achievement for female students

Category	*Frequency*	*Percentage (%)*
With compliments	4.00	8.00
Very satisfactory	19.00	38.00
Satisfactory	22.00	44.00
Less satisfactory	5.00	10.00
Not satisfactory	0.00	0.00

3.2 Title and authors Correlation Between Body Mass Index and Learning Achievement

The result of correlation analysis between body mass index and learning achievement showed the correlation coefficient of 0.448 for male students. For female students, the value of correlation coefficient is 0.521. Both of these results indicate that there is a healthy relationship between body mass index and student learning outcomes.

The result of correlation analysis between two variables means that increased body fat content will contribute to student learning outcomes. Body Mass Index results that indicate nutritional status can supplement with a healthy diet. Normal dietary status values will improve the students' learning concentration well and will directly affect the cognitive aspects of the students.

Shows the low healthy nutritional status. Thus, various other factors also associated with the results.

Similar results show that physical fitness and academic achievement are two things that are mutually exclusive. Children with excessive or unhealthy weight indicate a relatively lower academic performance. Aspects of physical fitness in adolescents should be a significant concern in maximizing school performance [14].

Fitness is not only related to aspects of student cognition but also affects the practical element. Better student behavior seen in students with healthy fat content [15].

The results of this study provide a reason for the management of education to consider the student's body fitness in achieving optimal learning outcomes. Students' motivation to improve their fitness will contribute to their learning outcomes.

4. Conclusions

Based on these results, it can conclude that the effort to improve student learning outcomes, body mass index values should be noticed. Body mass index can enhance by proper food consumptive pattern and sports pattern. Students' attention to the learning process that measures the aspects of cognitive, affective and psychomotor can achieved with student fitness. The students should concern their body mass index in standard category and avoid the obesity.

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