

The Relationship between Eating Behavior, Physical Activity, and Sleep Quality with Physical Fitness



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ABSTRACT: The purpose of the study was to determine the relationship of eating behavior, physical activity, and sleep quality to the physical fitness of students. This type of research is correlational research. The population in the study was class XI students at SMTI Yogyakarta. Researchers did not examine the entire population, but calculated the sample size of a population that had been determined using the Slovin formula with an error rate of 10% totaling 60 students. The analysis technique used regression with Statistical Package for Social Science (SPSS) version 21 software. The results show (1) There is a significant relationship between eating behavior and physical fitness of class XI students at SMTI Yogyakarta, with a p-value of $0.022 < 0.05$. (2) There is a significant relationship between physical activity and physical fitness of class XI students at SMTI Yogyakarta, with a p-value of $0.000 < 0.05$. (3) There is a significant relationship between sleep quality and physical fitness of class XI students at SMTI Yogyakarta, with a p-value of $0.002 < 0.05$. (4) There is a significant relationship between eating behavior, physical activity, and sleep quality on physical fitness of grade XI students at SMTI Yogyakarta, with a p-value of $0.002 < 0.05$ and a contribution of 73.20%.

KEYWORDS: eating behavior, physical activity, sleep quality, physical fitness

INTRODUCTION

Technology today has advanced rapidly. Technology is a current trend in the world of business, health education, entertainment, military training, medical, engineering design, robots, and telerobotics, manufacturing, education, and so on (Muktiani, et al., 2022). The rapid development of technology also has a negative impact on children's health and tends to use brain activity more than physical activity. Physical fitness owned by each individual is different, this depends on how the individual does physical activity. The development of physical fitness of each person through a sports activity that has the intention of increasing endurance and physical condition.

This change in lifestyle has resulted in a change in diet that refers to a diet high in calories, fat, and cholesterol but low in fiber, especially fast food, which has an impact on increasing obesity (Evert et al., 2019). Poor diet has been identified as a risk factor for chronic health conditions (Heath, 2016). The eating habits shown by adolescents are one of them consuming snack foods such as eating fried foods, drinking colored drinks, soft drinks, and consuming fast food (Costa, et al., 2018). Research by Larson et al., (2018), on the diet of adolescents in the United States showed that as many as 54% of US adolescents consumed all three main meals (breakfast, lunch and dinner).

The term physical activity is the movement of the limbs that causes energy expenditure which is very important for maintaining physical and mental health, as well as maintaining the quality of life to stay healthy and fit throughout the day (Ma'arif & Hasmara, 2021). Reduced physical activity will certainly result in weak physical condition or physical fitness. Weak physical fitness results in reduced productivity in carrying out daily activities (Mattioli, et al., 2020). Lack of movement activity causes students to easily experience fatigue during sports activities, overweight or obesity (Koleilat, et al., 2021).

Sleep is defined as a behavioral state characterized by reduced motor activity, decreased interaction and response with and to the environment, a specific posture (lying down and eyes closed) and can be easily awakened (Stormark et al., 2019). Someone who applies good quality sleep and regularly will have a better level of physical fitness (Zaky & Wati, 2020). The body experiencing excess sleep will also have an unfavorable impact on the body. This will result in the appearance of discomfort in the body and laziness to carry out activities the next day, resulting in a decrease in physical fitness (Handriana, et al., 2021).

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Gunarsa & Wibowo's research (2021) shows the results that sleep quality and physical fitness have a close relationship, by maintaining sleep quality it also maintains physical fitness. The results of Prasetyo & Winarno's research (2019) show that physical activity has a significant relationship with the level of physical fitness. The results of Syampurma's research (2018) show that there is a significant relationship between physical activity and physical fitness. The results of Anwar's research (2019) show that physical activity has a significant relationship with the level of physical fitness.

Based on the results of interviews, researchers found that 80.00% of learners often sleep late at night above 10 pm. The reasons for learners often sleeping late at night are quite diverse, 9 learners stated that they played online games, 5 learners stated that they played social media such as Tik Tok, Instagram, watching Youtube, and 2 other learners because they had problems sleeping. Most learners prefer to laze around while playing smartphones. Another problem found was the low physical fitness of learners. Teachers stated that they often see students sleepy during lessons, especially at the end of the lesson. Based on the explanation of the results of these observations, this study intends to find out more about "The Relationship between Eating Behavior, Physical Activity, and Sleep Quality with Physical Fitness".

MATERIALS AND METHODS

Research Design

This type of research is correlational research. Correlational research is research conducted to determine whether there is a relationship between two or more variables. The population in the study were grade XI students at SMTI Yogyakarta. Researchers did not examine the entire population, but calculated the sample size of a population that had been determined using the Slovin formula with an error rate of 10% totaling 60 students.

The eating pattern instrument uses the Dutch Eating Behaviour Questionnaire which includes 3 aspects of eating styles namely emotional eating, restraint eating, and external eating made by Van Strien, et al (1986) with a total of 28 questions. The score on each questionnaire answer uses a range of 1-5. The physical activity instrument is The Physical Activity Questionnaire for Adolescent (PAQ-A) by Kowalski (2014) which has been translated into Indonesian and has been modified. The sleep quality instrument used the Pittsburgh Sleep Quality Index (PSQI). The research instrument used was the TKSI for SMA / Phase EF students, which consists of five tests, namely the Coordination Test: Hand Eye Coordination Test, Explosive Power Test: Standing Broad Jump, Agility Test: T-Test, Arm and Shoulder Muscle Endurance Test: Dipping Test, Cardiorespiratory Endurance: Multi-Stage Fitness Test.

Statistical Analysis

The statistical analysis technique used the Statistical Package for Social Science (SPSS) version 21 software. Tingkat p-value statistik ditetapkan pada p-value < 0.05.

RESULTS

The results of descriptive statistics of eating behavior variables, physical activity, sleep quality, and physical fitness of students can be seen in Table 1.

Table 1. Descriptive statistics

Variable	Mean ± SD
Eating Behavior	61.90 ± 10.64
Physical Activity	2.44 ± 0.51
Sleep Quality	9.88 ± 4.45
Physical Fitness	13.30 ± 2.07

Normality Test

The normality test uses the Kolmogorov-Smirnov Test, namely by looking at the significance value of the residual variable if the p-value > 0.05, it can be said that the data is normally distributed. The results are presented in Table 2.

Table 2. Normality test results

Variabel	p-value	Keterangan
Eating Behavior (X1)	0,142	Normal
Physical Activity (X2)	0,308	Normal
Sleep Quality (X3)	0,481	Normal
Physical Fitness (Y)	0,074	Normal

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Based on the statistical analysis of the normality test that has been carried out using the Kolmogorov-Smirnov test, the normality test results are obtained with a p-value > 0.05, which means that the data is normally distributed.

Linearity Test

The linearity test is used to determine whether the independent variable and the dependent variable in this study have a linear relationship if the increase in the independent variable score is followed by an increase in the dependent variable score. The results of the Linearity test of this study can be seen in Table 3.

Table 3. Linearity test results

Variable	p-value	Keterangan
Physical Fitness (Y) * Eating Behavior (X1)	0.466	Linear
Physical Fitness (Y) * Physical Activity (X2)	0.072	Linear
Physical Fitness (Y) * Sleep Quality (X3)	0.423	Linear

Based on the table above, it can be seen that the relationship between the independent variable and the dependent variable is obtained p-value > 0.05. So, the relationship between the independent variable and the dependent variable is declared linear.

Hypothesis Test Results

The analysis technique used to test the hypothesis uses the t test (partial) and the F test (simultaneous), the results are as follows:

Table 4. Partial test analysis results (t test)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	6.400	1.259		5.083	.000
	Eating Behavior (X1)	.036	.015	.184	2.355	.022
	Physical Activity (X2)	.303	.041	.594	7.349	.000
	Sleep Quality (X3)	-.123	.037	-.264	-3.335	.002

a. Dependent Variable: Physical Fitness (Y)

Based on the analysis results in Table 4 above, it can be explained as follows.

- 1) The physical fitness variable on physical fitness obtained a p-value of 0.022 < 0.05, then H₀ is rejected, meaning that the hypothesis that reads "There is a significant relationship between eating behavior and physical fitness of class XI students at SMTI Yogyakarta" is accepted. The correlation coefficient is positive, meaning that if physical fitness is getting better, then physical fitness in class XI students at SMTI Yogyakarta will be better.
- 2) The physical activity variable on physical fitness obtained a p-value of 0.000 < 0.05, then H₀ is rejected, meaning that the hypothesis that reads "There is a significant relationship between physical activity and physical fitness of class XI students at SMTI Yogyakarta" is accepted. The correlation coefficient is positive, meaning that if physical activity is getting better, then physical fitness in class XI students at SMTI Yogyakarta will be better.
- 3) The variable of sleep quality on physical fitness obtained a p-value of 0.002 < 0.05, then H₀ is rejected, meaning that the hypothesis that reads "There is a significant relationship between sleep quality and physical fitness of class XI students at SMTI Yogyakarta" is accepted. The correlation coefficient is negative, meaning that if the quality of sleep is getting better, then the physical fitness of class XI students at SMTI Yogyakarta will be better.

The F (Simultaneous) test aims to determine the relationship of eating behavior, physical activity, and sleep quality to the physical fitness of class XI students at SMTI Yogyakarta. Analysis using ANOVA test. Analysis rules if F count > F table and p-value < 0.05, then the alternative hypothesis is accepted and vice versa..

Table 5. Simultaneous analysis results (ANOVA)

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	188.251	3	62.750	54.608	.000 ^a

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Residual	64.349	56	1.149
Total	252.600	59	

a. Predictors: (Constant). Sleep Quality (X3). Eating Behavior (X1). Physical Activity (X2)
b. Dependent Variable: Physical Fitness (Y)

Based on the results of the analysis in Table 5, the relationship between eating behavior, physical activity, and sleep quality on physical fitness obtained Fcount value 54.608 and p-value $0.000 < 0.05$. Thus the hypothesis that reads "There is a significant relationship between eating behavior, physical activity, and sleep quality on the physical fitness of class XI students at SMTI Yogyakarta", is accepted. It can be concluded that the regression model chosen is feasible to test the data and the regression model can be used to predict that eating behavior, physical activity, and sleep quality together relate to the physical fitness of grade XI students at SMTI Yogyakarta. Based on the Coefficient of Determination (R^2), it shows that the Adjusted R Square coefficient of determination is 0.732. This means that the contribution of eating behavior variables, physical activity, and sleep quality to the physical fitness of class XI students at SMTI Yogyakarta is 73.20%, while the remaining 26.80% is influenced by other factors outside this study.

DISCUSSION

Based on the results of the study, it shows that there is a significant relationship between physical fitness and physical fitness. The results of the study are supported by several studies including Mitchell's research (2018) which concluded that there is a relationship between BMI and eating behavior, where adolescents often consume fast food and are at a low level of physical activity. Makmun's research (2021) shows the influence of diet on obesity. Sirico, et al., (2018) revealed that in children, making better food choices is highly recommended for people who are overweight and obese. Eating habits are habits in choosing the type, amount and frequency of food consumed and how to choose food. Learners prefer to snack and try new things, so the higher to try new snacks. Adolescent snack habits are fried foods, colored drinks and high-fat foods. The role of parents is very important in shaping children's eating habits. When children become teenagers, environmental factors, peers and social life outside the home greatly influence their eating habits. External factors such as family support and food environment affect consumption behavior (Safitri & Rahayu, 2020). The content of nutritional status consumed should contain nutritional values that the body needs. The nutritional values of these foods are fat carbohydrates, vitamins, protein, minerals, and water and balanced protein so that they can be used for activities in daily life (Beerman, et al., 2020). The body's work function will depend on the intake that enters the body, the better the nutritional intake, it will support the performance of organs that will produce energy to improve body performance, although the supporting factors for the level of physical fitness are not only nutritional factors but can also be influenced by training, age, gender (Fühner et al., 2021).

Based on the results of the study, it shows that there is a significant relationship between physical activity and physical fitness. This means that the better the interpersonal intelligence, the better the physical fitness. The results of the study were supported by several studies including by Wanjaya (2019) which showed a relationship between physical activity and the level of physical fitness of students as indicated by a significance value of 0.000. The results of Prasetyo & Winarno's research (2019); Vania, et al., (2018); shows physical activity has a significant relationship with the level of physical fitness. The results of Putro & Winarno's research (2022); Calestine, et al., (2017) show that there is a relationship between physical activity and physical fitness.

The Muntaner et al. study (2018) states that if you have a habit of doing physical activity and have good physical fitness, it will support the health of students and will also have a good impact on the cognitive and academic abilities of students at school. The Cadenas-Sanchez et al. study (2020) found that children with good muscle strength, agility and speed are generally correlated with their academic abilities. Physical fitness is closely related to one of the health coaching efforts on the human factor whose goal is to increase the degree of health and human productivity. Physical activity to improve physical fitness must meet adequate intensity that will increase the level of physical fitness. Physical fitness is relative, meaning that physical fitness is not free but is related because it is always related to the physical activity carried out. The results of Martin's research, et al., (2018) revealed that physical activity will improve achievement learning. Physical activity is linked to improved overall health and can improve socialization and mental health skills. In addition, research has consistently identified a variety of specific benefits such as improved physical and physiological health and positive health outcomes in the areas of mental health and well-being (Chekroud et al., 2018).

Based on the results of the study, it shows that there is a significant relationship between sleep quality and physical fitness. This means that the better the emotional intelligence, the better the physical fitness. The results of the study are supported by several studies including by Gunarsa & Wibowo (2021) which show that sleep quality and physical fitness have a close relationship, by maintaining sleep quality it is the same as maintaining physical fitness. Research conducted by Safaringga & Herpandika (2018) shows the results that the level of physical fitness has a relationship with sleep quality. The results of Aminuddin's research, et al.,

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(2022) show that there is a significant relationship between sleep quality and physical fitness level. It is known that sleep is very important for overall body health (Paruthi et al., 2016). Lack of sleep or poor sleep quality will have a negative impact on health, including mental health such as depression, worry, anxiety, impaired physiological functions of the body such as motor disorders, cognitive impairment, emotions, performance during sports and is likely to increase the risk of injury, drug use, poor diet, obesity, poor academic performance, and drug use (Chaput et al., 2016; Freeman et al., 2017). The negative impact of sleep deprivation will affect skills, submaximal strength and muscle power, motor disorders, cognitive impairment, emotions, academic performance, poor diet (Fullagar et al., 2015; Medic, et al., 2017).

CONCLUSIONS

Based on the results of data analysis, description, testing of research results, and discussion, it can be concluded that: (1) There is a significant relationship between eating behavior and physical fitness of class XI students at SMTI Yogyakarta, with a p-value of $0.022 < 0.05$. (2) There is a significant relationship between physical activity and physical fitness of class XI students at SMTI Yogyakarta, with a p-value of $0.000 < 0.05$. (3) There is a significant relationship between sleep quality and physical fitness of class XI students at SMTI Yogyakarta, with a p-value of $0.002 < 0.05$. (4) There is a significant relationship between eating behavior, physical activity, and sleep quality on physical fitness of grade XI students at SMTI Yogyakarta, with a p-value of $0.002 < 0.05$ and a contribution of 73.20%.

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