

Effect of nutritional status and parents' income on physical fitness of elementary school students Efecto del estado nutricional y los ingresos de los padres sobre la aptitud física de los estudiantes de primaria

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Abstract. The purpose of this study was to examine the effect of nutritional status and parental income on students' physical fitness. This research was an experimental research aimed to examine the correlation among variables. The sampling technique used was purposive sampling with a sample size of 85 students (49 male students and 36 female students). The test was used to examine the correlation among variables. Anthropometric tests were used to examine students' BMI, parents' income questionnaires to see parents' income levels, and TKJI to examine students' physical fitness levels. The statistical test used the SPSS version 26 statistical program. The result of this research was there was correlation between nutritional status on physical fitness with sig. $0.002 < 0.05$. There was no correlation between parental income on physical fitness with sig value. $0.756 > 0.05$. There was a simultaneous correlation between nutritional status and parental income on physical fitness with sig. $0.005 < 0.05$, and the correlation of nutritional status and parental income simultaneously on students' physical fitness is 12.2%.

Keywords: Elementary School, Nutritional Status; Parents' Income; Physical Fitness, Student

Resumen. El propósito de este estudio fue examinar el efecto del estado nutricional y los ingresos de los padres sobre la aptitud física de los estudiantes. Esta investigación fue una investigación experimental cuyo objetivo fue examinar la correlación entre variables. La técnica de muestreo utilizada fue el muestreo intencional con un tamaño de muestra de 85 estudiantes (49 estudiantes varones y 36 estudiantes mujeres). La prueba se utilizó para examinar la correlación entre variables. Se utilizaron pruebas antropométricas para examinar el IMC de los estudiantes, cuestionarios de ingresos de los padres para ver los niveles de ingresos de los padres y TKJI para examinar los niveles de aptitud física de los estudiantes. La prueba estadística utilizó el programa estadístico SPSS versión 26. El resultado de esta investigación fue que existió correlación entre el estado nutricional y la condición física con sig. $0,002 < 0,05$. No hubo correlación entre los ingresos de los padres sobre la aptitud física y el valor sig. $0,756 > 0,05$. Hubo una correlación simultánea entre el estado nutricional y los ingresos de los padres sobre la aptitud física con sig. $0,005 < 0,05$, y la correlación del estado nutricional y el ingreso de los padres simultáneamente con la aptitud física de los estudiantes es del 12,2%.

Palabras clave: Escuela Primaria, Estado Nutricional; Ingresos de los padres; Aptitud Física, Estudiante

Fecha recepción: 24-06-24. Fecha de aceptación: 02-07-24

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Introduction

Basically, every individual has different nutritional needs, depending on age, gender, and daily physical activity. Due to the factors of age, gender and physical activity, the nutritional status of individuals also varies. Nutritional requirements are the minimum nutrition needed by the human body. Every physical activity carried out by humans requires energy. Energy comes from carbohydrates, fats and proteins in the form of food consumed by humans. Where the food is processed by the organs into energy and used for various daily activities.

The completeness of individual nutritional needs can be seen from the nutritional status of the individual. Nutritional status is a classification or measure of a person's nutritional state as seen by food consumption, absorption, and use of food nutrients (Sepriadi et al., 2020); (Sepriadi et al., 2022); (Chaeroni et al., 2023). Nutritional status is a balance between nutrient intake from food and the nutritional needs needed for body metabolism. Lack of nutrients can lead to weight loss and easy to feel tired. Excess nutrition is also not good for the body, where excess nutrition can lead to overweight and obesity and can cause degenerative diseases such

as diabetes mellitus, stroke and cancer.

Adequate nutrition is very important for the growth and development of students' brains, behavior, ability to work and productivity as well as resistance to infectious diseases. Inappropriate nutritional intake can also cause health problems, such as the body is not function properly when doing physical activities, especially sports activities. Therefore, adequate nutrition is very important for the growth and development of students. The need to obtain nutritious food is closely related to the income of parents, the higher income generated per month, the higher fulfilled of student's nutrition. On the other hand, the less of parent's income, the less fulfilled of student's nutrition.

There are many factors can affect student's nutritional problems while growing, including poverty, low education, food availability, job opportunities, cultural technology and family income (Supariasa, 2013); (Sepriadi et al., 2022); (Sepriadi, Eldawaty, et al., 2023). Factors that affect nutritional problems are actually interrelated. For example, parents who have low education will have smaller job opportunities, parents who have jobs with low incomes will of course have an impact on the availability of food which results

in a lack of nutritional intake for students.

In addition, lower socioeconomic status has been consistently related with health problem in childhood, especially in terms of physical fitness. Low socioeconomic conditions are also at risk of adult disease, students with low socioeconomic conditions in the United States and other developed countries tend to be overweight or obese (Tandon et al., 2012); (Agus et al., 2021). In 2016, according to WHO estimates, more than 340 million students and adolescents ranging in age from 5-19 years were living overweight or obese (Milanović & Talić, 2022). The prevalence of obesity (percentile >95) in students aged 5-15 years was 8.3% of the total 170.699 sample. The occurrence of obesity in students was caused by several factors including frequent consumption of fast food and lack of physical activity, both daily activities and structured activities.

Obesity is a condition in which an individual has a body mass index (BMI) >2 SD with the category of obesity. In pediatrics, obesity in students is one of the main concerns (Keykhaei et al., 2016). The results of the study suggested that the prevalence of overweight and obesity among the participants was 11.8% and 22.1% with the ratio of female students having higher rates of overweight and obesity than male students. The results obtained indicate that the percentage of BW and BMI of female students is higher (Gardašević et al., 2021). One of the factors caused the high percentage of obesity in female students was due to lower levels of motivation and desire, especially in carrying out physical activities and during learning physical education.

The correlation between obesity and low parental income is very concrete. It can be seen in the study that two thirds of obese people live in low- and middle-income countries and it is assumed that the number of obese students in these countries will increase over time (Ng et al., 2014). The state of obesity is correlated with the physical fitness of students. Based on research results, global overweight and obesity have increased by 47.1% among students between 1980 and 2013 (Ng et al., 2014). Due to lack of physical activity and being overweight, the desire to do physical activity was reduced. Students who were active, and always carry out daily and structured physical activities had the potential to have good physical fitness.

This study aimed to examine the effect of nutritional status on physical fitness of elementary school students, the effect of parental income on physical fitness of elementary school students, and the effect of nutritional status and income on physical fitness of elementary school students. Therefore, this study focused on nutritional status, parental income and also the level of physical fitness of elementary school students. The research had a hypothesis that the nutritional status and income of parents affect the physical fitness of elementary school students, the greater the income of parents, the nutritional status of students was good and the physical fitness of

students was good. Conversely, with less parental income, the nutritional status of students would be bad and had bad impact on students' physical fitness.

Methods

Study Design and Participants

This study was an correlation study with the aim to examine the effect of nutritional status (X_1) and parental income (X_2) on physical fitness (Y). The samples in this study were elementary school students from grades 4, 5 and 6 with an age group of 10-12 years. The sampling technique used purposive sampling with the age category of 10-12 years old with a total sample of 85 students. Data analysis used multiple regression analysis by looking at the effect between 3 variables, namely X_1 (nutritional status), X_2 (parent's income) and Y (physical fitness).

Test and Measurements

The test was used to examine the correlation among variables. Anthropometric tests were used to examine students' BMI, parents' income questionnaires to see parents' income levels and TKJI to examine students' physical fitness levels. TKJI with 5 test items, namely: 1) running 40 meters, 2) hanging bent elbows, 3) sit-up for 30 seconds, 4) vertical jump, and 5) middle distance running 600 meters.

Statistical Analysis

The statistical test used the SPSS version 26 statistical program. Multiple regression test was used to examine the correlation among variables of nutritional status, parents' income on the level of physical fitness of students.

Results

This study involved 85 students aged 10 to 12 years old (36 girls and 49 boys). The prerequisite test was carried out using the SPSS version 26 statistical program, namely the normality test using the Kolmogorov Smirnov test. Based on the normality test, it was known that the value of sig. 0.200 > 0.05 means the residual value was normally distributed. Normality test can be seen in table 1.

Table 1.
Normality test

Value sig.	p-value	Category
0,200	0,05	Normal

The picture of students with underweight nutritional status was spread on very low parental income of 1 student, moderate parental income of 2 students and high parental income of 1 person. In normal nutritional status, there were 26 students were with very low parental incomes, 17 students were low parental income, 9 students were medium parent

income, 11 students were high parental income and 5 students were very high parental income. In obese nutritional status, the income of parents was very low 5 students, 4 students with low parental income, and high parental income was 1 student. The nutritional status of obesity was spread out in very low parental income of 1 student, 1 student was low parental income of and 1 student was moderate parental income. Data tabulation can be seen in table 2.

Table 2.
Tabulation of Nutritional Status and Income of Parents

Variable	Parent's income				
	Very low	Low	Medium	High	Very high
Thin	0	0	0	0	0
Slim	1	0	2	1	0
Normal	26	17	9	11	5
Fat	5	4	0	1	0
Obesity	1	1	1	0	0
Total	85				

It was found that the percentage of IMB for male students was 6.12% with a thin body weight, 81.63% with a normal weight, 12.24% with a fat body weight and 2.78% for female students with a thin body weight, 77.78 % with normal weight, 11.11% with overweight, 8.33% with obesity. In the parental income data, it was found that the parental income level of male students was 6.12% very high, 24.49% high, 18.37% moderate, 22.45 low, and 28.57% very low. Meanwhile, for female students, parents' income levels were 5.56% very high, 5.56% high, 19.44% moderate, 19.44% low and 50% very low.

The results showed that nutritional status had effect on the level of physical fitness of students with sig. $0.001 < 0.05$ and on parental income there was no effect on students' physical fitness with a sig. $0.756 > 0.05$. T test can be seen in table 3.

Table 3.
T test

Variable	Value sig.	p-value	Categories
Nutrition Status	0,001	0,05	Correlated
Parent's income	0,756	0,05	Not correlated

To test hypothesis 3, the F test was carried out. The results of the calculation showed that there was simultaneous effect of nutritional status and parental income on the physical fitness of students with a sig. $0.005 < 0.05$. The F test can be seen in table 4.

Table 4.
F test

Value sig.	p-value	Categories
0,005	0,05	Simultaneously correlated

To examine the termination coefficient, it can be seen in the output summary model in the SPSS statistical program by looking at the R Square value of 0.122, which means that the effect of nutritional status and parental income simultaneously on students' physical fitness was 12.2%. For more details can

be seen in table 5.

Table 5.
Coefficient Determination

Model Summary	
R Square	0.122

Discussion

Female students who are overweight and obese were more than male students, it can be seen from the percentage of female students with 19.44% higher than the percentage of male students 12.24%. The findings are the same as the research conducted where the results of the study stated that more female students were overweight and obese compared to male students (Keykhaei et al., 2016). From the research data, it was found that 13 students who were overweight to obese on average from parents who had low to very low incomes with a percentage of fat 76.9% and obesity 23.1% of the 13 students who were overweight and obese. One of the factors that support overweight and obesity was the intake of food consumed every day. Such as instant food, high in fat, and less nutritious with a range of prices that were cheap and easy to find and in accordance with the income of parents who were in the low to very low category.

From the explanation above, it can be seen that there are factors that affect students' physical fitness. These factors can come from internal or external factors (environment). Internal factors were (1) food consumption, consuming foods rich in nutrients such as carbohydrates, proteins, minerals, fats and vitamins would support the nutritional adequacy of children so that children's nutritional adequacy will be fulfilled. On the contrary, if children consumed foods that are high in fat, low in carbohydrates, protein, vitamins and minerals so that children's nutrition was not fulfilled. This had a direct effect on the nutritional status of children. When the quantity and quality are in accordance with the needs of the child, it will have a good nutritional impact for the child, and when the child does not consume according to the needs of the child's body, it will provide urgent nutrition to the child. (2) Infection, is one of the factors from within, where this factor also has a direct effect on the condition of the child's body. In addition to food, infection can reduce children's physical fitness, where the condition of the child's immune system decreases due to diarrhea, flu, fever and even other congenital diseases.

In addition to internal factors, physical fitness is also effected by external or environmental factors including, (1) parental income, which is income in the amount of money generated per day or per month. The income will be spent for food to meet one of the family's needs. The level of family income also determines what type of food will be purchased. Family income is low, the family will buy food needs at low prices and family with high incomes will buy food needs at

high prices. (2) Environmental sanitation, poor environmental sanitation conditions can infect various types of diseases including diarrhea, intestinal worms, digestive tract infections. When the child is infected with a digestive tract infection, the absorption of nutrients will be disrupted and cause nutritional deficiencies and result in susceptibility to disease and the child's growth will be disrupted.

The results of the current study indicated that nutritional status had correlation on physical fitness. Nutritional status was a measure of a person's body caused by the food consumed and physiological conditions in the body (Agus et al., 2021); (Sepriadi et al., 2022); (Sepriadi, Syafruddin, et al., 2023). Nutritional status determined whether students are active or not when doing physical activity, if students are malnourished, students will feel weak, tired, lethargic, not enthusiastic, as well as excess nutrition in students will have an impact on the decline in students' physical fitness. Nutritional status had correlation with physical fitness by 7.54% (Agus et al., 2021); (Sepriadi, S., Hardiansyah, S., & Syampurma, 2017). Adequate and balanced nutrition can be consumed through carbohydrates, proteins, vitamins, fats and minerals. Nutritional status is a measure of a person's nutritional status obtained from daily food substances. The better a person's nutritional intake, the better the physical quality and nutritional status will be. Inadequate nutritional intake will reflect low physical and will have an impact on the level of physical fitness of students.

Parent's income had no correlation with students' physical fitness. The high and low income of parents cannot determine the nutrition of the food given to their children. When the income of parents is too low, then the nutritional intake given to children will be less, but the high income of parents cannot determine whether or not nutritional intake can be fulfilled in children. Many factors cause children to be malnourished including, an unsupportive environment regarding the importance of children's nutrition in the growth process, low parental income so that children consume instant, cheap and filling foods such as instant noodles, fried foods, and high-fat foods and the lack of parental knowledge about nutrition. The nutritional needs of children must be fulfilled so as to help children grow and develop. the higher the level of education of the mother, it does not guarantee the fulfillment of nutritional intake for children (Kurniasari & Nurhayati, 2017). This means that parents who come from high incomes cannot guarantee the fulfillment of children's nutrition due to several factors such as busy work, and lack of understanding about child nutrition.

The nutritional status and income of parents have correlation with the physical fitness of students simultaneously (Sepriadi, 2020). Good nutritional status and high parental income can support the high physical fitness of students. However, good nutritional status and high parental income cannot be used as a benchmark to see the good level

of students' physical fitness. Parents' income is only a measure of family spending. Parents with low incomes can buy nutritious food at cheap prices, but parents with high incomes can buy food at high prices but not necessarily the food has high nutrition. By fulfilling student nutrition through sufficient parental income, it can support students' daily activities. Based on the mapping of nutritional status, it can be concluded that the income level of parents cannot be used as a benchmark for the condition of students' physical fitness because students with normal categories are mostly found in parents' income with very low, low, medium, high to very high categories.

Conclusion

The conclusion in this study is there was correlation between nutritional status on physical fitness, and there was no correlation between parental income on physical fitness. Simultaneously nutritional status and parental income had correlation with physical fitness. Adequate nutrition can support a child's physical fitness to be good, but when the child's nutrition is poor so that the child's physical fitness will also be poor. Parents' income cannot be used as a benchmark for children's physical fitness. Parents with high incomes do not necessarily have children with good physical fitness, as well as low income parents do not necessarily have children with poor physical fitness.

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