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THE RELATIONSHIP OF NUTRITIONAL STATUS TO PEDIATRIC LEARNING ACHIEVEMENT IN PRIMARY SCHOOL-AGE CHILDREN

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Abstract Nutritional status is a measure of an individual's body condition, which can be observed through the food consumed and the utilization of nutrients. This research aims to determine the correlation between nutritional status and learning achievement in elementary school students in Cirebon Regency. This study employed a correlational research design. Purposive sampling was used to select 30 students aged 9-12 years old as the sample. The instruments used in this study were the CDC growth chart and the student's physical education report card scores for the odd semester of the 2023-2024 academic year. Data analysis was performed using Pearson correlation analysis with the help of SPSS 20 software. The normality test results showed that the data for nutritional status (p-value = 0.100) and physical education learning achievement (p-value = 0.095) were normally distributed. The linearity test showed a p-value of 0.802, indicating a linear relationship between the variables. The Pearson product-moment correlation test yielded a significance value (2-tailed) of 0.474 and a correlation coefficient (r) of 0.361. Since the p-value was greater than 0.05 and the r-value was greater than 0.05, it can be concluded that there is a significant correlation between nutritional status and learning achievement, indicating that nutritional status has a moderate effect on learning achievement.

Keywords: elementary school children; nutritional status; physical education learning achievement

INTRODUCTION

According to Susilowati & Rahmawati, (2020), nutrition is one of the determining factors of human resource quality. Nutritional problems can be in the form of overnutrition (obesity) or undernutrition (calorie-protein deficiency). Direct and indirect factors cause undernutrition. Indirect factors include the unavailability of food in the household, inadequate childcare practices, and low levels of education, knowledge, and skills of parents. Direct factors include an unbalanced diet and infectious diseases.

Nutrition is one of the key factors determining the quality of human resources. Nutritional problems can manifest as either overnutrition (obesity) or undernutrition (calorie-protein deficiency). Direct and indirect factors can cause undernutrition. Indirect factors include the unavailability of food in the household, inadequate childcare practices, and low levels of education, knowledge, and skills among parents. Direct factors, on the other hand, include an unbalanced diet and infectious diseases.

According to the World Health Organization (WHO), nutritional status is a key indicator for assessing health conditions, and it results from the balance between nutrient requirements and nutrient intake. Nutritional status assessment is conducted by comparing weight and height/length measurements. Children's nutritional status can vary depending on several factors, including gender, age, weight, height, and head circumference. This aligns with statement Putri, (2023) "Good nutritional status or optimal nutritional status occurs when the body receives enough nutrients that are used efficiently, allowing for physical growth, brain development, work capacity, and overall health at the highest possible level. Poor nutritional status occurs when the body experiences a deficiency in one or more essential nutrients. Nutritional status provides a macro picture of the nutrients in our body, including iron. Therefore, if the nutritional status is not normal, it is feared that the iron status in the body is also not good."

Several factors can influence a person's nutritional status, namely external factors and internal factors. External factors arise from outside, including how a person consumes food, a person's level of education, a person's low nutritional knowledge, a person's

lack of concern about environmental cleanliness and a person's socio-cultural background. Meanwhile, internal factors are essential to a person's dietary needs, including health status, gender and age." (Taufik, 2020).

High physical activity in school-aged children, irregular eating habits, and disregard for nutritional components can exacerbate malnutrition. School academic achievement is highly influenced by general ability, as measured by IQ (intelligence quotient). A high IQ can predict success in academic achievement. However, in some cases, a high IQ does not guarantee success in learning and living in society. Therefore, IQ is not the only factor determining a person's academic success. (Deevona et al., 2023).

Physical education in Indonesia is an integral part of the system education as a whole aims to develop aspects of health and fitness physical, movement skills, skills critical thinking, emotional stability, skills social, reasoning, and moral action through physical education.. It is hoped that through physical education and sports, students will be able to master other concepts and skills more easily and apply the skills learned from physical education to other fields of study. Therefore, the learning outcomes of physical education are very much related to the learning outcomes of physical education, and the fitness of students' bodies is very much related to their academic achievement. If the learning outcomes of physical education are good, then the level of physical fitness is automatically good, and it will affect the student's academic achievement. (Supariyadi et al., 2022). Basic motor skills test assessments are widely used, including basic motor skills tests manipulative. This basic manipulative movement test is used to measure basic manipulative movement skills in early childhood. This research aims to determine whether it is suitable and effective for measuring skills in basic manipulative movements in early childhood.

Achievement in physical education is the ability of students to understand, master, and apply the material of physical education (physical education, sports, and health) taught in school. Several factors, such as physical fitness, nutritional status, and other factors, can influence achievement in physical education. The definition of nutritional status has been explained in

the previous question, namely as one of the benchmarks in assessing health conditions that arise from the balance between nutrient needs and nutrient intake. According to Cahyadi et al., (2023) "Physical education is a part of overall education in schools that prioritizes the growth and development of three domains, namely the cognitive, affective, and psychomotor domains of students. Physical education and health is a learning process that is carried out through structured physical activities that aim to stimulate growth and development, improve physical, mental, emotional, and social abilities and growth, which are in line with efforts to form and develop basic motor skills, instill values, attitudes, and accustomize a healthy lifestyle".

Elementary school children are a strategic target for improving community nutrition because during this time, the functions of body organs, starting from the brain, have begun to function perfectly so that their intelligence develops rapidly. To support this development, children need adequate nutritional intake. If the intake does not match the high needs, of course, it will impact the child's physical and mental development. According to Susilowati & Rahmawati, (2020). "The high activity level of school-age children, irregular eating habits, and not paying attention to nutritional components will worsen the nutritional deficiencies of school-age children. Negligence and lack of attention in addressing and meeting the nutritional needs of school-age children have a sustainable impact on their growth and development in the next period of their lives".

From the above description, students' abilities after receiving their learning outcomes reach the cognitive, affective, and psychometric aspects. Therefore, learning outcomes can be seen through evaluation activities or tests that aim to obtain evidence data that will show the student's ability to achieve the learning objectives. Several factors, both internal and external, influence learning outcomes.

This research is important to be conducted to solve the problem of low physical education learning outcomes in elementary school children and to determine whether nutritional status has an effect on physical education learning outcomes and to what extent nutritional status affects students with the learning outcomes they can achieve.

METHOD

Based on the background, research objectives, and theoretical review, the research method used in this study is a quantitative approach, a purposive sampling method with a correlational study.

The sampling technique used purposive sampling with 30 students consisting of 15 male and 15 female students at one elementary school in Cirebon Regency. Data collection techniques include numbers, written information, and oral information. And various facts based on the research focus being studied to obtain conclusions.

Probability sampling techniques were used for data collection because they allow for accurate parameter estimation and reduce the potential for bias in the sample selection process.

The instruments used in this study are as follows.:

a. CDC Grow Chart

CDC growth charts show the distribution of height, weight, and body mass index (BMI) for children and adolescents in the United States. CDC growth charts measure children's growth and help paediatricians, nurses, and parents monitor growth and identify children with abnormal height, weight, or BMI. CDC growth charts come in several graphs, including growth charts for height, weight, and BMI.

CDC growth charts measure children's growth from 2 years to 20 years of age. For children aged 2 years to 24 months, height is used instead. CDC growth charts show different percentiles for each height, weight, or BMI measurement used to identify children with abnormal height, weight, or BMI.

To measure nutritional status, a stature meter is used to measure height and a weight scale with a scale of 0.5 kg is used to measure weight.

b. Physical education learning achievement category

Categories of learning achievement in the context of Regulation of the Minister of Education and Culture Number 53 of 2015 concerning Assessment of Learning Outcomes by Educators and Education Units in Elementary and Secondary Education (Regulation of the Minister of Education and Culture Number 53 of 2015) are part of the assessment standards used to measure learning progress, monitor learning outcomes, and detect student abilities.

This learning achievement category is part of the assessment standard used to measure learning progress, monitor learning outcomes, and detect student abilities in elementary and secondary education. Physical education learning achievement is seen from the report card value of the physical education subject in semester 1 of the 2023-2024 academic year to measure student learning achievement.

The data in this study was obtained using purposive sampling. The data collected in this study was weight, height, and report card values for the physical education subject. The analysis technique used in this study is product-moment correlation using a normality test, linearity test, and Pearson correlation using the SPSS 20 computer program.

RESULTS AND DISCUSSION

RESULTS

The normality test results are used to see whether the data obtained is normally distributed. The following is the calculation of the normality test.

Table 1. Normality Test Results Data

	saphiro-wilk. sig.
Nutritional Status	0,100
Physical Education Learning Achievement	0,095

Based on the normality test conducted using the Shapiro-Wilk test, data is declared normal if the significance value obtained exceeds 0.05. The normality test results for nutritional status were 0.100, while the results for physical education learning achievement were 0.095. It can be concluded that nutritional status and physical education learning achievement are normally distributed because the significance value obtained is > α (0.05), so H0 is accepted. The next step is to calculate the linearity test.

Table 2. Linearity Test Results Data

From the description of Table 2, it is found that if the significance of the deviation from linearity is > 0.05, there

is a linear relationship between the dependent and independent variables. Therefore, nutritional status and physical education learning achievement are stated to be linear or in line because the significant result is 0.802 > 0.05. After obtaining the results of the normality test and the linearity test, the next step is the Pearson Product Moment test. This test is conducted to see if there is an influence between nutritional status and physical education learning achievement.

Table 2. Linearity Test Results Data

			Sum of Squares	df	Mean Square	F	Sig.
Physical education learning achievement * Nutritional status	Between Groups	(Combined)	68.523	23	2.979	.876	.630
		Linearit	21.395	1	21.395	6.291	.046
		Deviation from Linearity	47.128	22	2.142	.630	.802
	Within Groups		20.407	6	3.401		
	Total		88.930	29			

Table 3. Pearson Product Moment Test Results Data.

		NUTRITIONAL STATUS	PHYSICAL EDUCATION LEARNING ACHIEVEMENT
NUTRITIONAL STATUS	Pearson Correlation	1	-.474**
	Sig. (2-tailed)		.008
	N	30	30
PHYSICAL EDUCATION LEARNING ACHIEVEMENT	Pearson Correlation	-.474**	1
	Sig. (2-tailed)	.008	
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

From the description in Table 3, it was found that the Sig. Value (2-tailed) of 0.474 > 0.05 and the r table value of 0.361 > 0.05. Therefore, there is a significant relationship. Based on the calculated r-value (Pearson correlation) of 1, the level of influence of the nutritional status variable on physical education learning achievement has a moderate relationship. Based on the analysis carried out, it can be concluded that there is an influence between nutritional status and physical education learning achievement.

DISCUSSION

In addition to utilizing relevant publications or references, the researcher also reviews the findings of previous studies to ensure that there is no duplication and as a source of reference to learn from past experiences, as obtained from previous studies, namely:

Oktaria Tri Anggraeni (2013). This study compared the physical education learning achievement, level of physical fitness, and nutritional status of students in grades 4 and 5 at SDN 2 Wirasana. The results of the study show

that nutritional status has a relationship with physical education learning achievement.

The difference in the research conducted by Oktaria Tri Anggraeni lies in the research subject. The sample used in this research was only students in grades 4 and 5, whereas in this study the students used as samples were students in grades 4, 5 and 6.

Second. Research conducted by Aniva Rahmawati (2021) with the title "The relationship between physical fitness and the learning outcomes of physical education subjects for male students in class VII B of SMP Negeri 4 Kuntodarussalam." Physical Fitness on the Learning Outcomes of Boys' Students at SMP Negeri 4 Kuntodarussalam " The difference in the research conducted by Aniva Rahmawati lies in research focus, in this research the research object is children First secondary school, while in this research the object of research is children elementary school.

According to Kunang, (2017) Education and health play important roles in the development of a country. The growth of a country is always driven and supported by talented individuals with intellectual, physical, and social capacities. Malnutrition has a significant effect on the neurological development and behavioural capacity of children. Children who do not eat a balanced diet, even for a short time, can develop problems with their physical, emotional, and cognitive development.

According to Nur et al., (2018) "Nutritional status is the state of the body as a result of food consumption and the use of nutrients. Nutritional status consists of 2 types, namely: "1) Normal nutritional status is a state of the body that reflects a balance between nutrient consumption and use by the body, and 2) Malnutrition is a pathological condition caused by a relative or absolute deficiency or excess of one or more nutrients". According Ikhsan, (2017) "Nutritional status is a condition of each individual that is influenced by food substances and can be distinguished between poor, less, good, and better nutritional status".

Physical Education is an important part of human life because, through Physical Education, an individual can learn about movement skills for an active lifestyle while also learning cognitive, affective, and psychomotor aspects that influence the growth and development of children to

stimulate the growth and development of balanced physical and psychological qualities for children. (Alif & Sudirjo, 2019).

School-age children are children aged 6-12 years who can already react to intellectual stimuli or carry out learning tasks that require intellectual or cognitive abilities (such as reading, writing, and counting). Generally, at the beginning of the age of 6, children start going to school, so children start to get to know a new world, children start to interact with people outside their family and start to get to know a new atmosphere in their environment. (Susilowati & Rahmawati, 2020).

Physical fitness is the ability of a person's body to perform tasks in daily life without experiencing significant fatigue and still have energy reserves to deal with sudden emergencies. The better an individual's physical fitness level, the more it will support learning outcomes. As stated by Widiastuti, (2019) Physical fitness is a translation of the term physical fitness, which can be interpreted as a physical condition that describes physical ability; it can also be interpreted as the ability of someone to do something well without causing significant fatigue. Whereas the components of physical fitness according to Pratama & Winarno, (2022) "Physical fitness is grouped into two aspects: health-related physical fitness and skill-related physical fitness. Health-related physical fitness includes: cardiovascular endurance, muscular strength, and flexibility. Skill-related physical fitness includes: speed, power, agility, balance, accuracy, and coordination. Physical education, sports, and health education at every level of education in Indonesia help the physical, psychological, and mental growth and development of children who are still in need of guidance at this time so that educational goals can be achieved properly." (Adi & Fathoni, 2020). "Academic achievement is a term used to indicate the achievement of success towards a goal, due to an effort that has been made by someone. In order to determine whether or not an educational and teaching goal has been achieved, it is necessary to make an effort and take action to assess learning outcomes".

CONCLUSION

"In accordance with the explanation of the several theories above, nutritional status is a state of balance in the body as a result of

consuming healthy food and consuming nutrients that are needed in the growth process. Good nutritional status is very necessary to maintain fitness and health, and to help children who want to achieve maximum sports performance. Therefore, the conclusion that can be drawn from this research is that the nutritional status of students can affect their academic achievement. To obtain good and healthy nutritional status, it is necessary to pay attention to the level of physical fitness of students, which can be seen from the body mass index, the selection and consumption of healthy food, and the sports activities carried out by students. Physical education in elementary school can help students improve their physical fitness, which will affect the academic achievement of students".

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