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# Analysis of Factors Supporting the Improvement of Physical Education Learning Outcomes in Students at SD Negeri 1 Babahrot, Indonesia

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**Abstract.** Physical Education, Sports, and Health (Penjasorkes) is an educational process that utilizes physical activities, systematically planned, intending to develop and enhance various organic, neuromuscular, perceptual, cognitive, and emotional aspects of individuals, all of which are integrated within the framework of the national education system. Through Penjasorkes, individuals can engage directly in various learning experiences through selected and systematically conducted physical, sports, and health activities. Thus, the role of Penjasorkes in the educational context is crucial, not only for physical aspects but also for the overall development of individuals in various dimensions of life. The purpose of this research is to determine the relationship between physical fitness and learning outcomes, the relationship between nutritional status and learning outcomes, the relationship between learning motivation and learning outcomes, and the combined relationship between physical fitness, nutritional status, learning motivation, and learning outcomes among students at SD Negeri 1 Babahrot. The research sample consisted of 79 students from SD Negeri 1 Babahrot. Instruments used to collect data include 1) the Indonesian Physical Fitness Test (IPFT), consisting of a 40-meter sprint, bent-arm hang (30 seconds), sit and reach (30 seconds), standing long jump, and 600-meter run; 2) nutritional status assessment through height and weight measurements; 3) learning motivation assessed through a Likert scale questionnaire. The research results can be summarized as follows: there is a significant relationship between physical fitness and learning outcomes, a significant relationship between nutritional status and learning outcomes, a significant relationship between learning motivation and learning outcomes, and a combined relationship between fluctuating learning outcomes with physical fitness, nutritional status, and learning motivation.

**Keywords:** Physical Fitness; Nutritional Status; Learning Motivation; Learning Outcomes.

## INTRODUCTION

Physical fitness is a primary concern, especially in the context of continuous learning for students. Besides physical fitness, a balanced nutritional intake supports the learning process. Parents are responsible for ensuring that students receive adequate nutrition before they depart for school. Maintaining balance in the nutritional intake should be considered, considering that poor nutritional status will affect children's academic performance. Learning motivation also plays a significant role in achieving optimal learning outcomes. High-motivation students tend to be more

focused, resilient, and diligent in their studies. Strong motivation can increase students' engagement in learning, strengthen their efforts to achieve learning goals and help them overcome obstacles during the learning process.

The initial observations at Elementary School Negeri 1 Babahrot indicate low academic achievement among students, attributed to several factors such as insufficient learning motivation and limited facilities and infrastructure, which lead to decreased enthusiasm for sports education. Other factors, such as parental economic and educational support, physical fitness,

and nutritional status, influence students' academic outcomes. Observations were conducted on students in grades 4 and 5, and some received grades below the minimum standards set by the school. These factors are believed to contribute to the low academic performance in physical education, sports, and health among students.

According to [1], students' health, especially their physical and psychological health, affects their learning outcomes. Good physical condition, including physical fitness and mental health, prepares students to learn effectively. Psychological factors such as intelligence, talent, interest in learning, motivation, and mental health also impact students' academic achievement.

Author [2] asserts that factors influencing learning outcomes can be divided into three types: internal factors (originating from within students), such as their physical and mental conditions; external factors (stemming from outside students), such as their surrounding environment; and learning approach factors, which encompass the strategies and methods of learning utilized by students.

According to [3], internal factors influencing students' learning outcomes can be grouped into three categories: physical factors, psychological factors, and fatigue factors. Physical factors refer to students' health and bodily condition that can affect their learning process. Psychological factors include intelligence, attention, interest, talent, motivation, maturity, responsibility, and readiness. Meanwhile, fatigue factors are divided into two types: physical fatigue and psychological fatigue.

Based on the above facts, many factors are suspected to influence students' physical education learning outcomes, such as physical fitness, self-confidence, learning motivation, study concentration, nutritional status, parental attention, and student discipline at Elementary School Negeri 1 Babahrot. Building upon these factors, the author aims to investigate in-depth whether students' low physical education learning outcomes are influenced by learning motivation and physical fitness, as well as the nutritional status of students.

## METHOD

This research employs a quantitative method using simple correlation. According to [4], quantita-

tive data-based research is an approach based on positivistic principles, where the data used are concrete data measured using statistical tools. This research aims to find correlations or relationships between one variable and another, with data measured in numerical form. Statistical techniques are used to analyze the data to draw desired conclusions regarding the research problem under investigation.

According to [4], research instruments are tools used to measure observed phenomena in the natural or social realm, often called research variables. The primary function of these instruments is to gather relevant data related to the variables under investigation. This study's instrument consists of test items designed to measure or assess understanding, knowledge, or specific abilities related to the studied variables. These test items assist researchers in gathering the necessary information to achieve research goals and draw accurate conclusions.

Data collection techniques are methods to obtain the necessary information in a research study. This includes the guidelines for conducting measurements used to gather data. This research uses testing and measurement techniques to collect the required data. First, physical fitness tests include a 40-meter Sprint, Bent-Arm Hang Test, Sit and Reach for 30 Seconds, Standing Long Jump, and 600-meter Run. Second, nutritional status tests involve measuring height and weight. Third, learning motivation tests use a Likert scale questionnaire. Fifth, learning outcome data is sourced from students' physical education grades in their report cards.

To determine the extent of the relationship between physical fitness, nutritional status, and learning motivation on the learning outcomes of students at SD Negeri 1 Babahrot, after obtaining data from field measurements, the next step is to analyze the data using statistical formulas.

## RESULTS AND DISCUSSION

*Description of Physical Fitness.* The results of the physical fitness test for 79 students of SD Negeri 1 Babahrot indicate four fitness categories: "good", "fair", "poor", and "very poor" (Table 1).

Only 1% of students fall into the "very poor" category with a fitness score of 8. 59% fall into the "poor" category, with scores ranging from 10 to 13.

**Table 1 – Frequency Distribution of Physical Fitness Among Students of SD Negeri 1 Babahrot**

No	Class length	Frequency	%	Class
1	5-9	1	1	Very Poor
2	10-13	47	59	Poor
3	14-17	30	38	Fair
4	18-21	1	1	Good
5	22-25	0	0	Very Good
Total		79	100	

Meanwhile, 38% of students fall into the "fair" category, with scores ranging from 14 to 17, and only 1% fall into the "good" category. Thus, more than half of the students at SD Negeri Babahrot have low levels of physical fitness.

*Description of Nutritional Status.* The results of the Body Mass Index (BMI) testing for SD Negeri 1 Babahrot students indicate that most students, totalling 57 individuals (72%), have a good or average nutritional status (Table 2).

**Table 2 – Frequency Distribution of Nutritional Status Among Students of SD Negeri 1 Babahrot**

No	Class length	Frequency	%	Class
1	<14	17	22	Underweight
2	14-19	57	72	Normal
3	20-21	4	5	Overweight Risk
4	21>	1	1	Overweight
Total:		79	100	

However, 17 students (21%) have BMI values below 14, indicating that they may be malnourished or classified as underweight. Additionally, 4 students (5%) are at risk of being overweight, and 1 student (1%) is classified as overweight.

*Description of Learning Motivation.* The results of the student learning motivation test at SD Negeri Babahrot indicate that the majority of students have a good level of motivation, with 67 students (85%) falling into the "very good" category and 12 students (15%) falling into the "good" category (Table 3).

From this data, the students' interest in learning at the school is relatively high, as the average learning motivation of students exceeds 70% of the total 79 students sampled in this study.

**Table 3 – Frequency Distribution of Learning Motivation Among Students of SD Negeri 1 Babahrot**

No	Interval, %	Frequency	%	Class
1	0-49	0	0	Very Poor
2	50-59	0	0	Poor
3	60-69	0	0	Fair
4	70-79	12	15	Good
5	80-100	67	85	Very Good
Total		79	100	

*Description of Learning Outcomes.* The student report data from SD Negeri Babahrot indicates that the scores for Physical Education tend to be low, with the average score of students only reaching a passing grade or barely surpassing the minimum passing score (71) (Table 4).

**Table 4 – Frequency Distribution of Student Learning Outcomes at SD Negeri 1 Babahrot**

No	Class length	Frequency	%	Class
1	<-70	24	30	Poor
2	71-81	54	68	sufficient
3	82-92	1	1	Good
4	93-100	0	9	Very Good
Total:		79	100	

From the data, 54 students (68%) received a "Pass" grade (71-81), while another 24 students (30%) did not meet the minimum passing score or scored below 71, categorized as insufficient. Only one student obtained a passing grade out of the 79 students sampled in this study.

*Prerequisite Tests.* Normality Test. Table 5 shows that the asymp. sig values for all variables are more significant than 0.05, indicating that the hypothesis that the sample is drawn from a normally distributed population is accepted. Based on this information, the data variables in this study can be analyzed using a parametric statistical approach.

**Table 5 – Results of Normality Test Calculate**

No	Variable	Asymp.Sig	Conclusion
1	Learning Outcome	0,061	Normal
2	Physical Fitness	0,200	Normal
3	Nutritional Status	0,062	Normal
4	Learning Motivation	0,200	Normal

Linearity Test. Table 6 shows that the asymp. sig values for all variables are more significant than 0.05, so the hypothesis that the sample is based on a normally distributed population is accepted. Based on this information, the variable data in this study can be analyzed using a parametric statistical approach.

Table 6 – Results of Linearity Test Calculation

Variable	Significance	Conclusion
Physical Fitness-Learning Outcomes	0,488	Linear
Nutritional Status-Learning Outcomes	0,442	Linear
Learning Motivation-Learning Outcomes	0,553	Linear

*Hypothesis Testing.* To determine whether there is a relationship between physical fitness, nutritional status, and learning motivation on student's academic performance at SD Negeri 1 Babahrot, hypothesis testing for the first through third hypotheses will be conducted using correlation analysis techniques. In contrast, hypothesis testing for the fourth hypothesis will utilize multiple regression analysis techniques.

Testing the first hypothesis. The first hypothesis states that physical fitness is related to students' academic performance at SD Negeri Babahrot. Hypothesis testing for this hypothesis employs simple regression analysis techniques, the results of which can be seen in Table 7.

Table 7 – Summary of the Relationship between Physical Fitness and Student Learning Outcomes at SD Negeri 1 Babahrot

Type of Correlation	Value of r		Description
	Calculated	Table (n-2=77, α=5%)	
X1 - Y	0,712	0,2213	Significance

The correlation coefficient obtained is 0.712, more significant than the critical value of r-table = 0.2213. This indicates that physical fitness significantly contributes to the academic performance of students at SD Negeri 1 Babarot.

Testing the second hypothesis. Hypothesis two states that there is a relationship between nutritional status and the academic performance of

students at SD Negeri Babahrot. Hypothesis two is tested using simple correlation analysis, as seen in Table 8.

Table 8 – Summary of the Relationship between Nutritional Status and Academic Performance of Students at SD Negeri 1 Babahrot

Type of Correlation	Value of r		Description
	Calculated	Table (n-2=77, α=5%)	
X2 - Y	0,243	0,2213	Significance

The correlation coefficient is 0.243, more significant than the critical value (r-table = 0.2213). This indicates nutritional status significantly contributes to students' academic performance at SD Negeri Babahrot.

Testing the third hypothesis. Hypothesis three states that there is a relationship between learning motivation and the academic performance of students at SD Negeri Babahrot. Hypothesis testing is conducted using simple correlation analysis; the results can be seen in the following table.

Table 9 – Summary of the Relationship between Learning Motivation and Academic Performance of Students at SD Negeri 1 Babahrot

Type of Correlation	Value of r		Description
	Calculated	Table (n-2=77, α=5%)	
X3 - Y	0,372	0,2213	Significance

The correlation coefficient obtained is 0.372, more significant than the critical value of 0.2213. This indicates that nutritional status significantly contributes to students' academic performance at SD Negeri Babahrot.

Hypothesis testing fourth. The significance of multiple regression was determined using the F-value.

Table 10 – Summary of Multiple Regression Significance Test Results

Ry	R <sup>2</sup>	Value of F		Description
		Calculated	Table	
0,728	0,530	28,969	2,73	Significance

From the analysis of various correlations, an F-value of 28.969 was obtained. This was then consulted with the critical F-value at a significance level of 5%, resulting in a crucial F-value of 2.73.

Therefore, the results of the multiple regression testing indicate significant findings. It is concluded that there is a substantial contribution between physical fitness, nutritional status, and learning motivation to students' learning outcomes at SD Negeri 1 Babahrot. The multiple correlation analysis is accompanied by the coefficient of determination ( $R^2$ ). The obtained coefficient of determination is 0.530, meaning that  $(0.530 \times 100\%) = 53\%$  of the variation in learning outcomes at SD Negeri 1 Babahrot is jointly determined by physical fitness, nutritional status, and learning motivation.

The research investigated the relationship between physical fitness, nutritional status, and learning motivation on students' learning outcomes at SD Negeri 1 Babahrot. The research findings indicate a significant relationship between the independent variables ( $X_1$ ,  $X_2$ , and  $X_3$ ) and the dependent variable ( $Y$ ). Multiple regression analysis reveals a significant relationship between physical fitness, nutritional status, and learning motivation on students' learning outcomes at SD Negeri 1 Babahrot. The coefficient of determination obtained is 0.530, meaning that  $(0.530 \times 100\%) = 53\%$  of the variance in students' learning outcomes at SD Negeri 1 Babahrot is collectively determined by physical fitness, nutritional status, and learning motivation.

The physical fitness test results for the 79 students of SD Negeri Babahrot depict a somewhat varied picture. Only 1% of students scored "very poor", with a score range of 8, indicating that generally, most students have a better fitness level. However, special attention needs to be given to the 59% of students categorized as "poor" with a score range of 10 to 13. This indicates potential health and fitness issues that need to be addressed. There are 38% of students in the "fair" category with a score range of 14 to 17, although there is still room for improvement. The lone student who scored "good" demonstrates individual success worth emulating. However, the fact that only 1% of students reached this category indicates the need to further encourage and support students in improving their physical fitness. With more than half of the students falling into the "poor" and "very poor" categories, intervention measures need to be taken to in-

crease awareness of the importance of physical activity and healthy lifestyles among students, whether through additional fitness programs, coaching, or education on balanced diets. Thus, collaborative efforts from the school, parents, and students themselves can contribute to improving health and physical fitness at SD Negeri Babahrot.

Based on the results of the Body Mass Index (BMI) testing conducted on students of SD Negeri 1 Babahrot, it can be concluded that most students exhibit good or average nutritional status, comprising 72% or 57 students. However, 17 students (22%) had BMI values below 14, indicating malnutrition or inadequate nutrition within this group. The presence of 5% of students (4 individuals) classified as at risk of being overweight and one student (1%) classified as overweight indicates variation in the BMI categories that require attention. This raises concerns regarding nutritional imbalances among these students, which can affect their growth and development. Therefore, prevention measures and education on the importance of healthy eating and active lifestyles among students are necessary, involving cooperation between schools, parents, and healthcare providers. Consequently, improvements in the nutritional status of students at SD Negeri 1 Babahrot can be expected, enabling them to grow and develop optimally while minimizing the risk of health problems associated with nutrition.

Based on the results of the learning motivation testing of students at SD Negeri Babahrot, it can be concluded that most students exhibit a high level of learning motivation. Most students, comprising 85% or 67 individuals, fall into the "very good" category regarding learning motivation, while 15% of students, or 12 others, are classified as "good." This data reflects a high level of interest in learning among students at SD Negeri Babahrot, with the average learning motivation exceeding 70% of the total 79 students sampled in this study. The dominance of the "very good" category indicates that most students have high spirits and enthusiasm for learning. This is a positive factor in improving students' learning outcomes and overall achievements. However, it is essential to remember that evaluating factors supporting this learning motivation is also crucial, including teaching approaches, environmental support, and adequate educational resources. By understanding and leveraging students' high learning motivation, schools can design more ef-

fective learning strategies and support the development of students' potential at SD Negeri Babahrot.

Based on the report card data of students at SD Negeri 1 Babahrot regarding Physical Education subject scores, there is a tendency towards relatively low grades. The average student scores indicate they can only achieve a "satisfactory" level or fail to meet the Minimum Passing Grade (MPG) set at 71. In this regard, 68% of students, or 54 individuals, received a "satisfactory" rating ranging from 71 to 81. Meanwhile, approximately 30% of students, or 24 individuals, failed to reach the MPG, receiving a "not satisfactory" rating, with scores below 71. Only one student out of the total 79 students sampled in this study managed to achieve a "satisfactory" score. These results indicate challenges in achieving learning outcomes in the Physical Education subject at SD Negeri 1 Babahrot. An in-depth evaluation is required to identify the factors causing this low performance, including teaching approaches that may need adjustment or improvement in supporting resources.

Efforts to improve teaching methods, emphasis on more interactive physical activities, and additional support for students in need can help enhance learning outcomes in the subject. Consequently, Physical Education learning at SD Negeri 1 Babahrot can become more effective and aligned with the established competency standards.

The research results show that physical fitness, nutritional status, and learning motivation significantly correlate with student learning outcomes at SD Negeri 1 Babahrot. Students must also have good physical fitness, nutritional status, and learning motivation to achieve good learning outcomes. This indicates that physical fitness, nutritional status, and learning motivation are crucial in supporting students to achieve optimal learning outcomes.

Physical fitness is crucial for students who are undergoing their education in school. This is supported by research explaining that physical fitness can enhance physical activity and thinking performance. Good physical fitness supports brain function, making individuals more efficient in thinking and learning. Additionally, low levels of physical fitness can lead to easy fatigue, which can hinder brain function and thinking [5]. Authors [6] state that if students have good physical fitness, it will contribute positively to the learn-

ing outcomes of Physical Education and Health (PJOK). This means that students with higher levels of physical fitness tend to achieve better learning outcomes in PJOK subjects. Physical fitness is an essential factor that students need to maintain to achieve good learning outcomes.

Nutritional status significantly influences students' cumulative academic achievements. Statistically, the impact of nutritional status on overall learning achievement is more significant than the performance in individual subjects. The nutritional status theory by UNICEF emphasizes that nutrition intake and disease-free conditions directly affect nutritional status. Although the research participants come from schools with a middle to upper-middle economic level, attention should be paid to eating habits, including consumption of unhealthy foods such as junk food [7]. Nutritional status is crucial in education because it can enhance intelligence and support physical and mental growth. The influence of nutrient intake on children is vital to prevent developmental disorders through maintaining optimal nutritional status. Insufficient dietary status can have serious consequences, leading to brain damage, illnesses, and stunted physical growth. These conditions collectively contribute to intellectual developmental disorders characterized by delayed nerve cell maturation, impaired motor skills, cognitive deficiencies, and slow social responses [8].

Learning motivation plays a central role in determining the effectiveness of learning. In learning activities, motivation is defined as the driving force within students that initiates, sustains, and directs the learning process. Motivation ensures the continuity of learning activities and serves as a guide to achieving the learners' desired goals. Students with solid motivation will bring positive energy to implement learning activities [9]. Motivation encourages students to learn and achieve objectives because they believe and are aware of the benefits and significance of learning. For students, motivation is crucial as it can steer student behaviour towards positivity.

## CONCLUSIONS

Based on the research findings, there is a significant relationship between physical fitness and learning outcomes. There is also an essential relationship between nutritional status and learning outcomes. Finally, there is an important rela-

tionship between learning motivation and learning outcomes. Thus, a meaningful relationship exists between physical fitness, nutritional status, learning motivation, and students' learning outcomes at SD Negeri 1 Babahrot.

The relationship between physical fitness, nutritional status, and learning motivation can significantly impact students' learning outcomes. Good physical fitness can enhance students' physical and mental health, creating optimal conditions for understanding and retaining information. Conversely, lack of physical fitness can lead to fatigue and lack of focus, hindering the learning process. Adequate nutritional status is essential because sufficient nutrition supports brain function and the energy needed to tackle learning tasks. Students with suboptimal nutrition may need help to concentrate and perform. Learning motivation, influenced by internal and external factors, is vital in motivating students to achieve

their academic goals. Good physical fitness and nutritional status can positively contribute to learning motivation, creating a positive cycle where students feel physically fit, have the energy to learn, and achieve academic success. Therefore, supporting the holistic relationship between physical fitness, nutritional status, and learning motivation is essential in creating an optimal learning environment for students' development.

Physical Education teachers should better understand the factors influencing students' learning outcomes in school.

Students should be more motivated to participate in physical activities at school to maintain or improve their current level of physical fitness.

Future researchers should conduct studies relevant to different methods, samples, timeframes, and locations.

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