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Exploring play activites, nutritional status and learning motivation on learning outcomes in children

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Abstract

Children's learning outcomes are in the low category, based on play activities, nutrition and motivation owned by children. This study aims to reveal the play activities, nutrition, and motivation children possess. This research method is correlation using quantitative methodology through a path analysis approach. The population in the study was upper-grade elementary school students. This sampling technique is random sampling, randomly taking 50% of each class at public elementary school 8 Lubuklinggau, a total of 79 students. Data were collected using questionnaires for learning motivation, anthropometric tests to obtain students' nutritional status, and primary data used to see the learning outcomes obtained. The results show the relationship between the independent variable and the dependent variable, with the Beta coefficient having a value of 0.009 for X1 and X3 (p31) and 0.092 for X2 and X3 (p32). While the second structure shows the relationship between the independent variables X1Y, X2Y, and X3Y with the same dependent variable, with the Beta coefficients having values of 0.236 for X1Y (py1), 0.219 for X2Y (py2), and 0.313 for X3Y (py3), it can be concluded that there is a simultaneous influence of play activities, nutritional status and motivation on learning outcomes. In conclusion, research shows that nutritional status and learning motivation play an important role in shaping student learning outcomes at public elementary school 8 Lubuklingau, Padang, Indonesia, with nutritional status also indirectly affecting learning outcomes through its impact on learning motivation.

Keywords: Play activities, nutrition status, learning motivation, learning outcomes.

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INTRODUCTION

Students' total growth, both physically and in terms of developing a lifelong healthy and active lifestyle, is greatly aided by physical education.

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(Sa'adah et al., 2014). Good learning outcomes in physical education can be achieved through high learning motivation, adequate nutritional intake, and regular sports activities. The hands-on teaching model plays a key role in presenting learning that is linked to students' real lives, ensuring the interconnectedness of concepts in the classroom with everyday life (Yang et al., 2022).

Physical education serves as a cornerstone for holistic student development, encompassing physical growth and fostering a lifelong commitment to health and activity (Sa'adah et al., 2014). A dynamic approach is crucial to achieving optimal learning outcomes, integrating high motivation, proper nutrition, and consistent engagement in sports (Yang et al., 2022). Embracing a hands-on teaching model becomes paramount, as it bridges theoretical concepts with real-life scenarios, ensuring students grasp the interconnectedness of classroom teachings with everyday experiences (Yang et al., 2022). In the realm of options, educators shoulder the rare responsibility for fundamental movement skills, game strategies, and essential values like sportsmanship and teamwork (Fauzan et al., 2021). Recognizing that learning extends beyond the confines of the classroom, it encompasses physical, mental, intellectual, emotional, and social dimensions (Fauzan et al., 2021). Tailored physical education curricula are instrumental at various educational levels, equipping teachers with the tools to effectively design, implement, and assess student activities (Oliveira et al., 2022).

Good nutritional status is a crucial factor in achieving optimal health; both physical and mental health, good nutritional status tends to have better learning outcomes, while nutritional disorders can affect students' learning ability and motivation (Sebataraja et al., 2014). Therefore, attention to nutritional intake and nutritional conditions of children is very important in the context of education (Nova & Yanti, 2018).

The importance of research related to nutritional status in children becomes very relevant in understanding its relationship with the learning outcomes of elementary school students. This study underscores the

urgency of nutritional status on learning outcomes, considering that children with good nutritional status tend to have better learning achievement (Cooper & Stewart, 2021; Marsh et al., 2020; Raghupathi & Raghupathi, 2020). However, nutritional status problems in children today can be a serious challenge that affects the learning process and student motivation. Therefore, there needs to be activities focused on improving nutritional status. One approach that can be taken is to provide integrated nutrition programs in the school environment, such as providing nutritious food and education about healthy eating patterns to students, parents, and educators (Amahmid et al., 2020; Aydin et al., 2021). In addition, cooperation with health agencies and local governments can assist in developing policies and programs that support the improvement of children's nutritional status in primary schools.

Observations on students in public elementary school 8 Lubuklingau, Padang, Indonesia, show that most have low learning outcomes, and it is strongly suspected that nutritional status and learning motivation have an effect on this. The difficulty of managing study time and needing a proper study plan are also challenges for students. Learning should include students' physical, mental, and emotional aspects and everyday life (Chiacchierini et al., 2022; Piccoli et al., 2023).

Child nutrition problems in the field can affect student learning outcomes, especially in assessment subjects (Dewi et al., 2023). Good nutrition is the foundation of public health, and lack of nutrition can lead to impaired physical growth, reduced catchability, and decreased immune function. Therefore, attention to child nutrition needs to be increased to support optimal learning outcomes (Henriques et al., 2023).

Student learning motivation is the key to achieving good learning outcomes. Intrinsic motivation comes from students, and extrinsic motivation, which comes from the environment, plays an important role (Nurrizka & Wicaksana, 2019). Pupils who strongly desire to learn are often more engaged in class activities and can accomplish the most learning objectives (Adelia et al., 2023).

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Motivation in children is a very important aspect in the context of education, especially at the elementary school level (Duke et al., 2021; Pulimeno et al., 2020). Motivation is one of the main factors that influence the level of student involvement in the learning process and the achievement of their learning outcomes (Amtu et al., 2020; Raza et al., 2020). Through a deep understanding of motivation, educators can develop more effective learning strategies and tailor their approach according to students' individual needs. Previous research has shown a positive correlation between levels of motivation and academic achievement (Abdelrahman, 2020; El-Adl & Alkharusi, 2020). Therefore, this research makes a significant contribution to developing more effective education policies and implementing more appropriate learning strategies to ensure that student motivation is always encouraged and their learning outcomes are maximally improved. Low learning motivation can be an obstacle in implementing learning programs, and learning outcomes become less good (Adawiah et al., 2019).

The purpose of this research is to ascertain the direct and indirect effects of nutritional status and learning motivation on the learning outcomes of student health workers. Good nutritional status is expected to increase students' physical and mental responsiveness, while high learning motivation is expected to increase student involvement in learning (Feria-Ramírez et al., 2023; Gordon & Weeden, 2023). This study involved elementary school students at public elementary school 8 Lubuklingau, Padang, Indonesia, with upper-grade students consisting of students in grades 4, 5, and 6 at the school. The selection of grade 4, 5, and 6 students at public elementary school 8 Lubuklingau is the result of observations that have been made by researchers in the past, showing the condition of learning outcomes carried out by students is very concerning. This takes at will a look at nutrition and motivation owned by children so that it can affect learning outcomes.

Through this research, it is hoped that strategies can be found to improve the learning outcomes of students, both through attention to

nutritional status, learning motivation, and the development of learning methods that are interesting and relevant to students' daily lives (Kumar Meena et al., 2022; McClintic et al., 2022). The conclusion of this study can be the basis for improving the education system, especially in the teaching subjects of students in public elementary school 8 Lubuklingau, Padang, Indonesia.

Research investigates student learning outcomes by analyzing the direct and indirect impacts of play activites, nutritional status and learning motivation on student learning outcomes. This involves collecting data on students' nutritional status, learning motivation level, and academic achievement. This research is important because it provides a deeper understanding of how nutritional status and learning motivation affect the learning outcomes of health students. By understanding these relationships, educators and policymakers can develop more effective instructional strategies and appropriate support programs to improve student academic achievement. This research includes its focus on aspects of health and education, which are two areas that are very important for the development of individuals and society as a whole. By combining these elements, the study can provide valuable insights into how factors such as nutritional status and learning motivation can influence academic achievement, thus allowing for the development of more effective intervention strategies.

METHOD

This study uses quantitative methodology through a path analysis approach, utilizing structural equations to examine causal relationships between dimensions of influence. Play activites (X1), Nutritional status (X2), and learning motivation (X3) to learning outcomes (Y). Path analysis, also known as causal modelling, explores the relationship between the independent variable and the dependent variable, which is usually presented in the form of a diagram containing arrows indicating the direction of influence of exogenous and endogenous variables.

https://doi.org/10.29407/js_unpgri.v10i1.21626
10 (1) 2024 | 58-75

This research was conducted from February to July 2022 at students in public elementary school 8 Lubuklingau, Padang, Indonesia. The population involved in this study involved students in public elementary school 8 Lubuklingau, Padang, Indonesia, in grades 4,5 and 6, totalling 158 students. This sampling technique is Random Samplinrandom sampling, in which each class and the total participants of this study involved 79 subjects, including students with diverse social and economic backgrounds. However, all are participants in formal education at the primary level with relevant basic skills. Monitoring research subjects is carried out by ensuring attendance at each research session, providing supervisors, monitoring behaviour, and making notes for each session to record progress and problems that arise. This study was conducted to see whether direct causal variables have an indirect influence on causal variables through the use of pat.

The analytical method applied in this study involves Path Analysis, a technique designed to examine causal relationships between independent variables and compiled to analyze causal relationships between variables in the form of hypothetical models based on scientific substance, namely theoretical foundations. Path analysis serves as an analytical method or technique used to investigate causal relationships, aiming to distinguish the direct or indirect impact of a group of independent variables on the dependent variable. This analysis focuses on deciphering the causal relationships in those relationships arranged in the form of hypothetical models based on scientific substance, that is, theoretical foundations. Meanwhile, causal data between variables can be analyzed using path analysis through a structural equation approach.

RESULT

In summary, the data description of this study provides information on the minimum and highest scores, as well as the mean value and standard deviation. The research data are described as follows. These are the data :

1. Learning Outcomes

The research data on learning outcomes reveals an average score of 163.20 and a standard deviation of ± 2.00. The minimum score observed was 159, while the maximum reached 167. The research data on learning outcomes was obtained based on the report card for the first semester of the 2022/2023 academic year, which was taken based on the final semester exam in physical education subjects with an average score of 163.20 with a standard deviation of ±2.00. The minimum score observed was 159, while the maximum reached 167. More details can be seen in the table below:

Table 1. Learning outcomes

Value Interval	Classification	Frequency (f)	Percentage (%)
>166.22	Very good	6	7.6
164.21– 166.22	Good	14	17.7
162.19– 164.20	Average	34	43.0
160.19- 162.18	Less	15	19.0
< 160.19	Very less	10	12.7
Sum		79	100.0

The table above shows the frequency distribution of student learning outcomes in 79 samples of 6 people (7.6%) in the very good category, 14 people (17.7%) in the good category, 34 people (43.0%) in the average category, 15 people (19.0%) in the less category and 10 people (12.7%) in the less category.

2. Play Activities

Based on research data obtained through a Likert scale questionnaire that includes active/passive aspects, how to play, benefits, game tools, where to play, number of games, and playtime For playing activities, an average value of 135.75 was obtained with a standard deviation of ± 11.33, a minimum value of 108 and a maximum of 170. More details can be seen in the table below:

https://doi.org/10.29407/js_unpgri.v10i1.21626
10 (1) 2024 | 58-75

Table 2. Play activites

Value Interval	Classification	Frequency (f)	Percentage (%)
>152.71	Very good	4	5.1
141.62 – 152.71	Good	23	29.1
130.53– 141.61	Average	30	38.0
119.44- 130.52	Less	16	20.3
< 119.44	Very less	6	7.6
Sum		79	100.0

The table above shows the frequency distribution of student learning outcomes in 79 samples of 4 people (5.1%) in the very good category, 23 people (29.1%) in the good category, 30 people (38.0%) in the average category, 16 people (20.3%) in the less category and 6 people (7.6%) in the less category.

3. Nutritional Status

Based on research data for playing activities, an average value of 16.23 was obtained with a standard deviation of ± 2.44, a minimum value of 12.76 and a maximum of 22.89. Based on research data for nutritional status, measured through weight scales and height measurements, which are then fed into the BMI formula and consulted with the nutritional status classification table, obtained an average value of 16.23 with a standard deviation of ± 2.44, a minimum value of 12.76 and a maximum of 22.89. More details can be seen in the table below:

Table 3. Nutritional status

Value Interval	Classification	Frequency (f)	Percentage (%)
<-3 SD	(severely thinness)	0	0.0
-3 SD up to < -2 SD	(thinness)	14	17.7
-2 SD up to +1 SD	(normal)	56	70.9
+ 1 SD up to +2 SD	(overweight)	8	10.1
> + 2 SD	(obese)	1	1.3
Sum		79	100.0

The table above shows the frequency distribution of the nutritional status of students from 79 samples of 14 people (17.7%) in the category of undernutrition (thinness), 56 people (70.9%) in the category of good nutrition (normal), 8 people (10.1%) in the category of overweight and 1 person (1.3%) in the category of obesity (obese).

4. Learning Motivation

Research data for learning motivation was obtained and measured through a Likert scale questionnaire with detailed indicators, including intrinsic and extrinsic motivation. The average score is 111 with a standard deviation of ± 14.20, a minimum of 71 and a maximum of 143. More details can be seen in the table below:

Table 4. Learning motivation

Value Interval	Classification	Frequency (f)	Percentage (%)
>133.22	Very good	2	2.5
118.41 – 133.22	Good	24	30.4
103.60 – 118.40	Average	34	43.0
88.79 – 103.59	Less	14	17.7
< 88.79	Very less	5	6.3
Total		79	100.0

The table above shows the frequency distribution of student motivation from 79 samples of 7 people 2 people (2.5%) in the very good category, 24 people (30.4%) in the good category, 34 people (43.0%) in the average category, 14 people (17.7%) in the less category and 5 people (6.3%) in the less than one category.

Normality Test

The calculation results of the normality test can be seen in Table 5, while the summary of the calculation results of the normality test can be seen in the following table :

Table 5. Normality test results summary

Variable	Lilliefors Test		Conclusion
	L_o	L_{tabel}	
Learning Outcomes	0.997	0.100	Normal
Play Activities	0.166	0.100	Normal
Nutritional Status	0.147	0.100	Normal
Learning Motivation	0.129	0.100	Normal

Based on the calculation of the variable normality test above, it was found that all values of Sig. Variables are greater than Sig α (0.05), so it can be concluded that all variable data are normally distributed.

https://doi.org/10.29407/js_unpgri.v10i1.21626
10 (1) 2024 | 58-75

Linearity Test

The results of the test analysis can be seen in the appendix, while the summary of homogeneity results can be seen in the following table:

Table 6. Linearity test results

	Linearity Test		Conclusion
	Sig	Sig.α	
X1, Y	0.110	0.05	Linear
X2,Y	0.353		Linear
X2, Y	0.335		Linear
X1, X3	0.670		Linear
X2, X3	0.235		Linear

Based on the results of the calculation of the linearity test of the research variables above, it was found that all values of Sig. Relationships between research variables are more significant than Sig. α (0.05), it can be concluded that all relationship data between variables tend to form a linear line so that then hypothesis tests can be carried out after all analysis requirements are met.

Hypothesis Test

Testing this hypothesis will be carried out with a path analysis approach using the SPSS 26 program, the output of the variables of play activity (X1), nutritional status (X2), learning motivation (X3), and learning outcomes (Y) will be presented as follows:

Table 7. Summary of path coefficients between research variables

Model	Variable	Beta Koef	Sig
Structure 1	X1,X3(p31)	0.009	0.940
	X2,X3 (p32)	0.092	0.423
Structure 2	X1Y(py1)	0.236	0.023
	X2Y(py2)	0.219	0.036
	X3Y (py3)	0.313	0.003

Based on the results of the analysis above, the first structure shows the relationship between the independent variables X1, X2, and X3 with the dependent variable that is not mentioned, with the Beta coefficients having values of 0.009 for X1 and X3 (p31), and 0.092 for X2 and X3 (p32). Meanwhile, the second structure shows the relationship between the independent variables X1Y, X2Y, and X3Y with the same dependent variable, with the Beta coefficients each having values of 0.236 for X1Y (py1), 0.219 for X2Y (py2), and 0.313 for X3Y (py3), it can be concluded that Ho is rejected and Ha is accepted, meaning that there is a

simultaneous influence of play activities, nutritional status and motivation on the physical education learning outcomes of students.

DISCUSSION

The research conducted at public elementary school 8 Lubuklingau, Padang, Indonesia, aimed to investigate the low learning outcomes among students and explore the direct and indirect influences of exogenous variables on endogenous variables. The study focused on students in grades IV, V, and VI, with a random sampling technique applied to select 50% of each class, totalling 79 participants. Data collection involved questionnaires for learning motivation, anthropometric tests for students' nutritional status, and primary data to assess the learning outcomes obtained (Hakim et al., 2023). The findings from the research and data analysis indicate that (1) Learning outcomes are directly and significantly influenced by nutritional status, (2) Learning motivation directly impacts learning outcomes, and (3) Nutritional status indirectly affects learning outcomes through its influence on learning motivation (Feng et al., 2023; Guo et al., 2023).

This research provides an understanding of the factors that influence student learning outcomes, especially in the context of physical education learning. Research findings show that play activities, nutritional status, and learning motivation have a significant role in determining student learning outcomes, with nutritional status also indirectly influencing learning motivation. The results of the data analysis also revealed that learning related to students' daily lives, such as play activities, had a positive impact on their learning outcomes. This provides an important foundation for designing a more holistic physical education curriculum, paying attention to the physical, psychological, and social aspects of students to support the achievement of optimal learning outcomes.

The significance of supporting students' learning outcomes is a primary concern in the field of education. The low learning outcomes among students at public elementary school 8 Lubuklingau, Padang, Indonesia, were the focal point of this research. The studied population

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10 (1) 2024 | 58-75

encompassed students in grades IV, V, and VI, with 79 participants randomly selected from each class. The research findings underscored the importance of both nutritional status and learning motivation in influencing students' learning outcomes, with nutritional status exhibiting a direct impact and also influencing outcomes indirectly through its effect on learning motivation (Schiff & Supriady, 2023; Syahruddin, 2022). Addressing these factors could enhance students' overall learning achievements in the studied context (Berdida, 2023; Do et al., 2023).

Implementing targeted interventions to address the identified factors affecting learning outcomes is crucial for educational improvement (Almomani et al., 2023). The research emphasizes the direct and significant impact of nutritional status on learning outcomes, suggesting that initiatives to enhance students' nutritional well-being could positively influence their academic performance (Dong & Liu, 2022; Rutherford et al., 2023). This finding underscores the need for school-based programs that promote healthy nutrition and well-being, involving collaboration with parents and the local community to create a holistic support system for students (Hendriks et al., 2023; Tsai et al., 2023).

Moreover, recognizing the direct influence of learning motivation on learning outcomes emphasizes the significance of cultivating an optimistic and motivating learning environment (Gao et al., 2023; Karabatak et al., 2023). Educators and school administrators should explore strategies to boost students' intrinsic motivation, such as incorporating engaging teaching methods, providing constructive feedback, and creating a supportive classroom atmosphere. Understanding the dynamic interplay between these factors allows for the development of targeted interventions that cater to the specific needs of students, potentially leading to improved learning outcomes over time (Adam et al., 2023; Alipour et al., 2023).

In conclusion, the comprehensive analysis of the research findings highlights the intricate connections between nutritional status, learning motivation, and learning outcomes. The study not only identifies these factors but also emphasizes their interdependence. Addressing the

challenges posed by low learning outcomes requires a multifaceted approach that considers both nutritional and motivational aspects. By implementing targeted interventions and fostering a conducive learning environment, educators and policymakers can contribute to enhancing the overall educational experience and outcomes for students at public elementary school 8 Lubuklingau, Padang, Indonesia.

This research reveals that nutritional status and learning motivation play a significant role in determining student learning outcomes, with nutritional status having a direct impact and learning motivation having an impact on both direct and indirect inactivations of the study, including a generalization of results due to a focus on one school and other factors not considered in the analysis. Practical recommendations based on research findings include the need for targeted interventions to improve student learning outcomes, including health programs and motivational learning education, as well as collaboration between educators, parents, and local communities to create holistic support systems.

CONCLUSION

This study confirms the important role of nutritional status and learning motivation in achieving optimal learning outcomes for students at the primary school level. These findings provide a deeper understanding of the factors that influence student learning and suggest that interventions to improve nutritional status and learning motivation can have a significant positive impact. By strengthening the link between nutritional status, learning motivation, and student learning outcomes, this research provides a solid foundation for developing more holistic and sustainable educational strategies.

In addition, the results of this study succeeded in achieving the objectives set in the introduction, namely to identify the direct and indirect influence of nutritional status and learning motivation on student learning outcomes. This study revealed a clear relationship between these variables through a path analysis approach, proving that nutritional status impacts learning outcomes and individual learning motivation. Thus, this

https://doi.org/10.29407/js_unpgri.v10i1.21626
10 (1) 2024 | 58-75

research successfully provides new and relevant insights in the context of improving the quality of education, as well as providing a solid basis for the development of policies and intervention programs aimed at improving academic achievement and student well-being.

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