International Journal Of Humanities Education And Social Sciences ***(IJHESS)*** *E-ISSN:* **2808-1765**
Volume 4, Number 5, April 2025, *Page. 2182 – 2189*
Email : editorijhess@gmail.com

Examining The Correlation Between Nutritional Status, Exercise Habits And Physical Fitness Levels: A Survey Of Students

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Abstract

This research aims to determine the relationship between nutritional status, exercise habits, and students' physical fitness levels at SMP N 4 Bandar Seikijang. The method in this research used a quantitative approach with correlational design through survey method. The population in this study was 164 students, and the sampling technique used was cluster random sampling, resulting in 47 students. The instruments used in this research were BMI/Age for nutritional status, an exercise habits questionnaire, and an MFT test to measure physical fitness. The analysis used was logistic regression. Based on the analysis results, it was found that nutritional status had a sig value of 0.007 < ρvalue (sig) 0.05. Data analysis showed that nutritional status had a sig value of 0.007 < ρvalue (sig) 0.05, with a determination coefficient of 47%. Thus, Ho1 was rejected, and Ha1 was accepted. Therefore, there is an affiliation between nutritional status and physical fitness level of 47%. Meanwhile, exercise habits had a sig value of 0.922 > ρvalue (sig) 0.05. Thus, Ho2 was accepted, and Ha2 was rejected. Therefore, there is no relationship between exercise habits and physical fitness level. The Logistic Regression results showed a sig. Value of 0.215. This indicates that sig (0.397) > alpha 0.05 means H0 is accepted and H1 is rejected. Thus, there is no affiliation between nutritional status, exercise habits, and physical fitness level. It can be concluded that there is no significant relationship between nutritional status and exercise habits with physical fitness levels among students at SMP N 4 Bandar Seikijang.

Keywords: Nutritional Status, Exercise Habits, Physical Fitness.

INTRODUCTION

Nutritional status significantly impacts child development and human capital formation. Childhood nutrition influences adult health outcomes, with height-for-age and BMI-for-age z-scores affecting various health indicators in adulthood (Smith et al., 2012). Stunting, wasting, and underweight remain prevalent in resource-limited settings, with nutritional status positively correlating with multiple domains of child development (Workie et al., 2020). Adequate nutrition is crucial for proper growth, health, and development, particularly in early childhood when children are vulnerable to malnutrition or obesity (Kurnia et al., 2024). Nutritional deficiencies can lead to reduced human capital accumulation and labor productivity, posing obstacles to economic development. While promising interventions exist, malnutrition is a complex issue requiring multifactorial approaches. Further research is needed to improve compliance and sustainability for successful large-scale policy implementation, especially in addressing the emerging double burden of malnutrition in resource-poor settings (Bommer et al., 2020). Nutritional status is a state of the body resulting from food consumption and using nutrients in the form of certain variables that specific methods can measure. Low or abnormal nutritional status will impact the level of physical fitness. Several Southeast Asian countries, including Singapore, Brunei Darussalam, Malaysia, and Thailand, have a higher HDI compared to Indonesia, which in 2020 was ranked 107 out of 189 countries (Kristjánsson et al., 2010). Research consistently shows a significant relationship between nutritional status, physical activity, and physical fitness in school-age children. While one study found no correlation between nutritional status and physical fitness (Rahmatillah & Mulyono, 2019), other studies

reported a significant association (Mappaompo & Sudirman, 2023). Physical activity was positively correlated with physical fitness levels (A.Mappaompo & Nur, 2020). The studies emphasize the importance of balanced nutrition and regular physical activity in supporting students' physical fitness and academic performance. These findings highlight the interconnected nature of nutrition, physical activity, and overall student well-being.

Research indicates a significant relationship between nutritional status and academic achievement in school-age children (Peni et al., 2020; Rahmatillah & Mulyono, 2019). Proper nutrition supports cognitive abilities, with normal nutritional status associated with better learning outcomes (Peni et al., 2020) However, findings on the link between nutritional status and physical fitness are mixed, with one study showing no significant relationship (Nurmalasari et al., 2023). Physical fitness itself may influence academic achievement by improving thinking ability and learning concentration (Iriyani K et al., 2023). Malnutrition can negatively impact academic performance, with undernourished children being 5.6 times more likely to have lower academic achievement compared to well-nourished peers. These studies emphasize the importance of maintaining good nutritional status in school-age children to support their cognitive development and academic success.

Sports participation offers multifaceted benefits for physical, mental, and social health. Regular physical activity helps regulate body weight, reduces obesity risk, and prevents conditions like cardiovascular diseases and diabetes (Abdullah, 2023). It also enhances muscle and bone density, contributing to long-term health. Psychologically, sports boost self-confidence, reduce stress and depression, and improve cognitive function (Eime et al., 2013). Socially, sports promote interaction, community bonding, and the development of social skills. Team sports, in particular, are associated with improved psychosocial health outcomes compared to individual activities (Eime et al., 2013). While the benefits are significant, challenges such as busy lifestyles and unequal access to facilities can hinder participation (Abdullah, 2023). Addressing these barriers is crucial for maximizing the positive impact of sports on public health (Saefullah et al., 2024).

Physical fitness is a crucial aspect of health, particularly for adolescents and adults. Multiple factors influence physical fitness, including both internal and external elements. Internal factors encompass genetics, age, and gender, while external factors include physical activity, nutritional status, and hemoglobin levels (Adriani & Fadilah, 2023). Nutritional status and physical activity have been shown to have a significant relationship with physical fitness levels in students. Hemoglobin levels play a vital role in physical fitness, as they affect oxygen transport throughout the body. A study on police officers found that physical fitness is related to job performance (Sari et al., 2024). Research has demonstrated that nutritional status, physical activity, and hemoglobin levels all contribute to cardiorespiratory ability, with hemoglobin levels having the strongest influence (Kusuma et al., 2019). These findings underscore the importance of addressing both internal and external factors to improve overall physical fitness.

From the explanation above, it can be concluded that to improve physical fitness, one way is by exercising regularly. Regular physical activity and proper nutrition are crucial for the health and development of school-age children. Exercise, particularly aerobic activities, can improve physical fitness and overall well-being (Mulyana et al., 2024; Mustikawati et al., 2024). While nutritional status may not directly correlate with physical fitness, it significantly impacts academic achievement (Rahmatillah & Mulyono, 2019). Integrating physical education with nutrition education in school curricula can enhance students' knowledge about healthy eating habits and the importance of regular exercise (Siddik et al., n.d.). Health education programs in schools are essential for improving students' understanding of nutrition and physical activity (Mustikawati et al., 2024). These initiatives should involve various stakeholders, including teachers, parents, and the school community, to ensure sustainable implementation. By

prioritizing physical fitness and nutrition education, schools can support the optimal growth and development of children, preparing them for a healthier future (Mulyana et al., 2024).

Initial observations at SMPN 4 Bandar Seikijang indicate a decline in students' physical fitness levels, characterized by fatigue during physical activity, low participation in sports activities, and an increasing trend in students with non-ideal nutritional status." Alternative solutions to identify the relationship between nutritional status and exercise habits with physical fitness levels can be an initial step in developing appropriate interventions to holistically improve students' physical fitness. Although there have been many studies on adolescent physical fitness, there is still a gap in understanding the specific interactions between nutritional status and exercise habits in the context of junior high school students in semi-urban areas such as Bandar Seikijang. Recent studies have explored the relationship between nutritional status, physical activity, and physical fitness among junior high school students in Indonesia. Several studies have found significant correlations between physical activity, nutritional status, and physical fitness levels (Supriatna et al., 2024). Studies have shown that moderate physical activity, adequate energy, and protein intake are associated with better nutritional status in adolescents (Taufik et al., 2024). Further research is needed to understand this relationship fully in specific contexts, such as semi-urban areas such as Bandar Seikijang. Recent research has shown the importance of a multifactorial approach in understanding adolescent physical fitness, considering physical aspects and behavioral and environmental factors that influence nutritional status and exercise habits. This study offers a new perspective by integrating the analysis of nutritional status and exercise habits simultaneously and considering the specific characteristics of the semi-urban environment that may influence students' physical fitness levels.

This study aims to analyze the relationship between nutritional status and exercise habits with students' physical fitness levels at SMPN 4 Bandar Seikijang and to identify the factors that influence these interactions. The results of this study are significant as a basis for developing effective and sustainable physical fitness improvement programs at the junior high school level, as well as contributing to a more comprehensive understanding of the factors that influence adolescent physical fitness in semi-urban areas.

RESEARCH METHODS

The research conducted used correlational research. Correlational research is a study that connects one or more dependent variables without any attempt to influence the variable (Maksum, 2009). The population taken in this study were all students of SMP N 4 Bandar Seikijang, totaling 164. Cluster random sampling was carried out by taking samples per class randomly from all classes at SMP N 4 Bandar Seikijang. In the study, two research instruments were used, namely: 1) Exercise habits questionnaire adopted from the sports development index book (Mutohir & Maksum, 2007) to obtain information about students' exercise habits, 2) BMI/U to measure nutritional status, 3) MFT (Multi Stage Fitness Test) to measure physical fitness levels.

RESULT AND DISCUSSION

Table 1. Data from logistic regression results of nutritional status and exercise habits with the level of physical fitness of students at SMP N 4 Bandar Seijkijang.

Variabel	Aprrox. sign
Survey of Nutritional Status and Exercise Habits with Physical Fitness Level of Students of SMP N 4 Bandar Seikijang	0,395

The calculation using the SPSS 20.0 program shows that sig (0.395). This shows that sig (0.395)> alpha 0.05 means that H0 is accepted and H1 is rejected. So, there is no survey of nutritional status and exercise habits regarding the level of physical fitness of students of SMP N 4 Bandar Seikijang. From the conclusion above, there is no significant relationship between nutritional status and exercise habits and the level of physical fitness of students of SMP N 4 Bandar Seikijang.

Discussion

Based on the results of the research conducted using SPSS 20.0 data analysis, it is proven that nutritional status has a significant relationship with the level of physical fitness. In contrast, exercise habits do not have a significant relationship with the level of physical fitness of students of SMP N 4 Bandar Seikijang. This is because nutritional status has a sig value of 0.007 <pvalue (sig) 0.05, while sports activities have a sig of 0.922> pvalue (sig) 0.05.

The results of the study showed that students who had normal nutritional status had very poor and moderate physical fitness. While students who had very thin and thin nutritional status had very poor and poor physical fitness. And nutritional status had a sig value of 0.007 <pvalue (sig) 0.05. From this information, it can be concluded that nutritional status is related to physical fitness, especially in students of SMP N 4 Bandar Seikijang. Meanwhile, for the results of the study on exercise habits, students who were not used to exercising had very poor, poor and moderate physical fitness. While students who were used to exercising had very poor physical fitness. And exercise habits had a sig value of 0.922> p value (sig) 0.05. From this information, it can be concluded that exercise habits are not related to physical fitness, especially in students of SMP N 4 Bandar Seikijang.

With the results of the analysis above, it can be explained that nutritional status has a relationship with physical fitness. Physical fitness is influenced by internal and external factors. Internal factors are related to elements within the human body, while external factors are related to elements outside the human body. Internal factors include genetics, age, and gender, while external factors include physical activity, nutritional status, health status, hemoglobin levels, and adequate rest. Based on the analysis of exercise habits questionnaire, there were students who had exercise habits categorized as "not accustomed to exercise" yet showed moderate physical fitness levels, which represents an inverse relationship between exercise habits and physical fitness values. Additionally, many students who were categorized as "not accustomed to exercise" had very poor physical fitness values, which represents a direct relationship between exercise habits and student physical fitness values. This is supported by the data in this study showing that 94.1% of students were not accustomed to exercise, which correlates with the high number of students falling into the very poor category of physical fitness.

The findings regarding the relationship between nutritional status and physical fitness in junior high school students align with previous studies. However, this study adds a variable of exercise habits that have not been studied before. This shows that the determinants of physical fitness are multifaceted. A meta-analysis showed a moderate correlation (r = 0.438) between nutritional status and physical fitness, indicating that although nutritional status is important, other factors also play a role (Akkase et al., 2024). Previous studies have shown that physical

activity and nutritional status are related to physical fitness, but the influence of exercise habits has been under-researched (Putro & Winarno, 2022). This study emphasizes exercise habits as an important factor influencing physical fitness, which has not been discussed in previous studies (Mujibuddin et al., 2024). Motivation and exercise habits are known to have different effects on physical fitness, indicating that these factors can improve understanding of fitness outcomes in students (Nurdin et al., 2024). Although the current study extends previous findings by including exercise habits, it is important to consider that other external factors, such as socioeconomic status and access to resources, may also significantly influence nutritional status and physical fitness outcomes in students (Ngangbam, 2023).

The relationship between nutritional status, exercise habits, and physical fitness is closely related to energy metabolism and adaptation to physical exercise. A balanced diet combined with regular physical activity improves students' aerobic capacity and overall physical ability. This synthesis of findings from multiple studies highlights several key aspects of this relationship. Adequate nutrition is essential for optimal athletic performance, affecting muscle strength and cardiovascular endurance (Sandi et al., 2024). Poor nutrition can lead to decreased physical ability and increased risk of injury, while proper nutrition supports recovery and metabolic efficiency. Regular physical activity increases metabolic flexibility, allowing the body to adapt to varying energy demands (Zhu et al., 2022). Studies have shown that nutritional status and physical activity significantly influence physical fitness levels in adolescents (Malicevic et al., 2022). Encouraging health and exercise education can improve fitness outcomes by addressing activity levels and diet (Supriatna et al., 2024). Conversely, although the benefits of nutrition and exercise have been well documented, some argue that genetic factors also play an important role in determining physical fitness, suggesting that lifestyle changes alone may not be enough for everyone.

Research shows that regular exercise habits are associated with improved physical fitness and body composition in college students. College students who exercise at least 3 times a week demonstrate higher levels of fitness and healthier body composition compared to those who exercise less frequently (Kim et al., 2018). Similarly, school children who participate in extracurricular sports activities demonstrate higher levels of physical activity and fitness, particularly in aerobic capacity (Arriscado et al., 2015). A study of high school and college students found that 30% exercised 3 or more times per week, while 16% never engaged in sports or physical activity (Ngangbam, 2023). Regular exercise was also associated with better study habits, with 39% of physically active college students studying 3 or more times a week compared to only 10% of inactive students (Ngangbam, 2023). These findings underscore the importance of promoting regular physical activity and extracurricular sports to improve students' overall fitness and potentially impact their academic performance.

The findings of this study have implications for the need to develop integrated fitness programs in schools that combine nutrition education with structured physical activity, as well as the importance of monitoring nutritional status and fitness regularly." This study has limitations in terms of sample coverage which only includes one school, does not take into account family socio-economic variables, and has not measured psychological aspects that may influence students' exercise habits. For further research, it is recommended to expand the sample coverage to several schools, integrate socio-economic and psychological factor analysis, and conduct longitudinal studies to understand changes in students' fitness patterns and nutritional status over time.

CONCLUSION

Based on the data analysis, it was found that nutritional status had a significance value of 0.007 < ρvalue (sig) 0.05, with a determination coefficient of 47%. Thus, Ho1 was rejected, and Ha1 was accepted. Therefore, there is an affiliation between nutritional status and physical fitness level of 47%. Meanwhile, exercise habits had a significance value of 0.922 > ρvalue (sig) 0.05. Thus, Ho2 was accepted, and Ha2 was rejected. Therefore, there is no relationship between exercise habits and physical fitness level. The Logistic Regression results showed a significance value of 0.215. This indicates that sig (0.397) > alpha 0.05 means H0 is accepted and H1 is rejected. Thus, no affiliation exists between nutritional status exe, exercise habits, and physical fitness level. It can be concluded that there is no significant relationship between nutritional status and exercise habits with physical fitness levels among students at SMP N 4 Bandar Seikijang. Based on the research findings, developing an integrated program that includes nutrition education, periodic nutritional status monitoring, and implementation of structured physical activity programs in schools with the active involvement of teachers, parents, and students is recommended. This research contributes to developing theoretical models about the relationship between nutritional status, exercise habits, and physical fitness in the context of junior high school students in the region, which can serve as a foundation for further research and development. Future research is suggested to expand the sample coverage to several schools, integrate socio-economic and psychological factor analysis, and conduct longitudinal studies to understand changes in student fitness patterns and nutritional status over time.

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