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Association between free nutritious meal consumption and nutritional status in elementary school children

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Abstract

Background: The Free Nutritious Meal Program is a government initiative aimed at improving the health and nutritional status of the population. However, the provision of nutritious meals through this program does not automatically lead to improvements in nutritional status. The success of the Free Nutritious Meal Program requires sustained and appropriate healthy eating behaviors among beneficiaries.

Purpose: To analyze the relationship between nutritious food consumption behavior and the nutritional status of students Elementary School who are beneficiaries of the Free Nutritious Meal Program.

Method: This study employed an analytical correlational design with a cross-sectional approach. The sample consisted of 241 students from grades 1 to 6. Data were collected using a nutritious food consumption behavior questionnaire and nutritional status measurements. Statistical analysis was performed using Spearman's rank correlation test.

Results: Most students demonstrated good nutritious food consumption behavior (64.7%). The majority had normal nutritional status (59.8%), with a mean BMI-for-age Z-score of 0.67 ± 1.59 . Spearman's rank correlation analysis showed a correlation coefficient of 0.103 with a significance value of $p = 0.109$ ($p > 0.05$).

Conclusion: There was no statistically significant relationship between nutritious food consumption behavior and the nutritional status of students at Gedongkiwo Elementary School. However, based on school records prior to receiving the Nutritious Meal Program program, 11 students who were at risk of stunting, 20 students who were underweight, and 4 students who experienced wasting had achieved normal nutritional status at the time of the study.

Suggestion: These findings should be interpreted with caution, as the cross-sectional design does not allow for the observation of changes in nutritional status before and after the implementation of the Free Nutritious Meal Program. Further longitudinal studies or studies that consider students' baseline nutritional status are recommended.

Keywords: Elementary School Children; Nutritious Food Consumption Behavior; Nutritional Status.

INTRODUCTION

Nutritional status is a physical condition resulting from the balance between nutrient intake and the body's utilization of nutrients obtained from consumed foods, reflecting an individual's overall health condition. Nutritional status is generally classified into three categories: overnutrition, normal nutritional status, and undernutrition. Therefore, nutritional

status reflects the extent to which the body acquires and utilizes nutrients to maintain health and perform its physiological functions optimally (Mardalena, 2021).

Poor nutritional status can have negative effects on the development of school-aged children. This condition may disrupt brain metabolism, resulting in

impaired cognitive functions such as memory, thinking ability, and concentration, thereby preventing them from functioning optimally (Hoata, Sutadarma, & Dewi, 2021). In addition, inadequate nutrient intake can impair immune function, slow gastric emptying, and reduce blood glucose levels, which are essential for maintaining energy and concentration during the learning process. These conditions may negatively affect children's academic performance and hinder their optimal educational development (Sammeng & Soumokil, 2023).

Elementary school children are generally between 6 and 12 years of age and are enrolled in formal primary education. During this stage, children experience rapid growth and development in physical, cognitive, social, and emotional aspects. The elementary school years represent a critical period for developing learning abilities, thought patterns, and behaviors, including the establishment of healthy lifestyle habits and balanced nutritional intake, which serve as the foundation for children's development in subsequent stages of education (Suhartatik, Aprilia, Herawati, & Setyaningish, 2022).

According to the World Health Organization (2024), approximately 150.2 million children are affected by stunting, 42.8 million experience wasting, and 35.5 million are overweight, indicating that both undernutrition and overnutrition remain significant global challenges. Nutritional problems among school-aged children in Indonesia also continue to be a serious challenge in health development (World Health Organization, 2024). Based on the Indonesian Health Survei 2023, the prevalence of stunting in Indonesia remains at 21.5%. This figure indicates that approximately one in five children in Indonesia experiences growth impairment due to chronic malnutrition. Nutritional problems not only affect physical growth but also influence children's cognitive development and learning abilities at school. Children who experience malnutrition tend to have lower levels of concentration and weaker immune systems (Ministry of Health of the Republic of Indonesia, 2023).

According to the Health Profile of the Special Region of Yogyakarta 2023, 17.45% of school-aged children aged 7–12 years were classified as overnourished, while 2.49% were classified as undernourished. Meanwhile, the Yogyakarta City Health Profile (2024) reported that the prevalence of

stunting, wasting, and underweight among children in Yogyakarta City was 11.76%, 4.38%, and 11.82%, respectively. Therefore, ensuring adequate nutritional intake for school-aged children is essential for supporting their growth, development, and overall health has become a major concern for the government, as reflected in the implementation of various strategic policies (Yogyakarta City Health Office, 2024).

Law of the Republic of Indonesia Number 17 of 2023 on Health emphasizes the importance of nutrition education in supporting children's growth and development. As a follow-up measure, the government launched the National Healthy Breakfast Before 9 A.M. Movement to increase public awareness of the importance of healthy breakfast habits, particularly among students. This commitment was further strengthened through the implementation of the Free Nutritious Meal Program which was initiated in 2025. Policy reinforcement has also been demonstrated through the involvement of national nutrition coordination personnel, including the provision of nutritious meals and healthy breakfasts for students.

Nutritional status has a positive impact on school attendance, intelligence, and physical fitness among children, while also contributing significantly to their overall nutritional intake. In addition, parents and teachers need to pay close attention to children's dietary patterns and nutritional intake, as these factors influence students' health and physical fitness (Sukendro, Yahya, Widowati, Indrayana, Putra, Irawan, & Lestari, 2022).

Public perceptions regarding the fulfillment of children's nutritional needs increasingly support the idea that the regular provision of nutritious meals at school can improve children's learning concentration. The Free Nutritious Meal Program can provide sufficient energy for daily activities and help meet the body's nutritional requirements, including nutrients essential for children's growth and development. Furthermore, research has shown that the habit of consuming meals provided through the Free Nutritious Meal Program is significantly associated with nutritional status, which indirectly has a positive effect on learning concentration (Saputra & Kartika, 2023).

School-based activities that support the nutritional status of elementary school children include the Free

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Nutritious Lunch Program, which provides students with healthy and nutritious meals. Furthermore, the regular consumption of nutritious meals can help prevent the increasing prevalence of obesity and promote better cardiometabolic health in the future (Sulianto & Charrisa, 2024).

A study conducted with another research entitled "The Effectiveness of the Free Meal Program on the Nutritional Status of Elementary School Students," found that the program significantly improved children's nutritional status, including improvements in Body Mass Index (BMI) and dietary patterns. The program increased dietary diversity and reduced undernutrition. It also contributed to improved academic performance and supported children's growth and cognitive development, particularly among those from low socioeconomic backgrounds. However, despite its evident benefits, its impact on chronic forms of malnutrition such as stunting requires further investigation, as well as long-term evaluations to assess its effects on children's overall educational and health outcomes (Desiani & Syafiq, 2025).

Another study entitled "The Free Nutritious Lunch Program: A Strategy to Improve Nutritional Quality and Educational Outcomes at SDN 13 Cempaka Pekanbaru," reported that the Free Nutritious Meal Program successfully achieved its objective of improving students' nutritional intake. This success was supported by the active involvement of teachers in supervising meal consumption and ensuring that eating utensils were properly maintained. Such supervision represents an important component of school nutrition programs, as food distribution alone does not guarantee consumption or the desired outcomes (Wiranata, Yunita, & Sari, 2025). However, another study indicated that the nutritional effectiveness of meals provided through the Free Nutritious Meal Program continues to be constrained by low levels of nutrition literacy and selective eating behaviors among students. Therefore, the National Nutrition Agency should collaborate with Statistics Indonesia, the Ministry of Health, and independent research institutions to conduct baseline surveys assessing the impact of the Nutritious Meal program on eating behaviors, student participation, and household socioeconomic conditions (Suprpto, Praditya, Dewi, & Adiyoso, 2025).

Gedongkiwo Elementary School, located in

Mantrijeron District, Yogyakarta City, is one of the schools that has been participating in the Free Nutritious Meal Program since May 2025. The school has a total of 241 students, consisting of 120 male students (49.8%) and 121 female students (50.2%).

Based on a survey conducted in May 2025, there were 11 students at risk of stunting, 20 students who were underweight, and 4 students who experienced wasting. All students received meals through the Free Nutritious Meal Program. However, not all students consumed the meals provided at school, and some preferred to take the food home due to a mismatch between the menu offered and their personal food preferences. This situation may hinder the optimal achievement of the program's objectives, as the nutritious food provided is not consumed at the appropriate time.

The habit of taking meals home also suggests that healthy eating behaviors among students may not yet be well established. This observation is supported by the presence of students who appeared weak, sleepy, unfocused, and in some cases even fainted, which may indicate an imbalance in daily nutritional intake, including the consumption of nutritious meals. Nutritional status among school-aged children plays an important role in determining physical growth, cognitive development, and academic achievement. Although height and weight measurements are conducted every semester and the school has received supplementary feeding support in the form of free nutritious meals from the government, no direct evaluation of students' nutritional status has yet been conducted.

RESEARCH METHOD

This study employed a quantitative correlational design with a cross-sectional approach. The research was conducted at an elementary school in Yogyakarta. The study population consisted of all students in grades 1 through 6 who were enrolled in the 2025/2026 academic year, totaling 241 students. A total sampling technique was used, whereby all eligible students were included in the study. Data were collected using a nutritious food consumption behavior questionnaire and nutritional status measurements. Statistical analysis was performed using Spearman's Rank Correlation Test. Bivariate analysis was conducted to determine the relationship between the independent var

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RESEARCH RESULTS

Table 1 Characteristics of Respondent (N=241)

Variable	Result	P-value
Gender (n/%)		
Male	120/49.8	
Female	121/50.2	
Nutritious Food Consumption Behavior (n/%)		
High	156/64.7	
Middle	79/32.8	
Low	6/2.5	
Nutritional Status (n/%)		0.109
Underweight	10/4.1	
Normal	144/59.8	
Overweight	45/18.7	
Obesity	42/17.4	

Based on Table the total number of respondents was 241 students, consisting of 120 male respondents (49.8%) and 121 female respondents (50.2%). the majority of respondents were categorized as having a high level of nutritious food consumption behavior, comprising 156 children (64.7%). This was followed by the moderate category with 79 children (32.8%) and the low category with 6 children (2.5%). These findings indicate that most respondents demonstrated good nutritious food consumption behavior. The majority of respondents had normal nutritional status, accounting for 144 children (59.8%). A total of 45 children (18.7%) were classified as overweight, 42 children (17.4%) as obese, and 10 children (4.1%) as underweight. These findings indicate that most children had a normal nutritional status. However, some children still had a history of or were at risk for other nutritional problems. After receiving the Free Nutritious Meal Program, it was reported that 11 students were at risk of stunting, 20 students were underweight, and 4 students experienced wasting. Nevertheless, at the time of data collection, these students were classified as having normal nutritional status based on the BMI-for-age indicator used in this study. These findings suggest that the normal nutritional status observed at the time of measurement does not.

Based on the study results, Spearman's Rank Correlation Test showed that the correlation

coefficient between nutritious food consumption behavior scores and nutritional status was 0.103, with a significance value of $p = 0.109$ ($p > 0.05$) and a sample size of $n = 241$. These results indicate that there was no statistically significant relationship between the two variables.

DISCUSSION

Based on the study findings, the level of nutritious food consumption behavior among respondents showed that the majority of respondents were categorized as having good nutritious food consumption behavior, accounting for 156 children (64.7%). This was followed by the moderate category with 79 children (32.8%) and the low category with 6 children (2.5%).

The findings of this study are consistent with another reported, who stated that free meal programs in elementary schools have the potential to improve the quality of students' nutritional intake when meal consumption and acceptance levels are categorized as good (Desiani & Syafiq, 2025). These findings are further supported another study which demonstrated that the implementation of the Free Nutritious Meal Program in elementary schools can have a positive impact on students' learning conditions when the meals are properly consumed by the participants (Tanziha, Ekayanti, & Ahmad, 2025). Furthermore, previous studies have suggested that the

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effectiveness of school nutrition programs depends not only on food availability but also on students' willingness and consistency in consuming the meals provided. In addition, the study conducted emphasized that the nutritional status of school-aged children is strongly influenced by the adequacy of their daily nutrient intake (Permatasari, Ritanti, & Siregar, 2023). Therefore, school-based nutritious meal programs represent an important strategy for supporting optimal nutritional status. Accordingly, the predominance of a high category of Free Nutritious Meal Program consumption behavior observed in this study serves as a positive indication of the program's implementation at the school.

Based on the study findings, the nutritional status of the respondents showed that the majority of children were classified as having normal nutritional status, accounting for 144 children (59.8%). A total of 45 children (18.7%) were classified as overweight, 42 children (17.4%) as obese, and 10 children (4.1%) as undernourished.

The findings of this study are supported with another research who reported that most school-aged children fall within the normal nutritional status category, although there is an increasing trend in overnutrition associated with children's dietary patterns (Permatasari, Ritanti, & Siregar, 2023). Similarly, Hanifah et al. (2025) found that elementary school children in Indonesia are predominantly characterized by normal nutritional status; however, overnutrition and micronutrient malnutrition remain important public health concerns. These findings are consistent with those of another research who emphasized that although school-based nutrition interventions can help maintain normal nutritional status among most students, the prevalence of overweight and obesity among school-aged children continues to rise due to changes in dietary habits and lifestyle patterns (Desiani & Syafiq, 2025).

Therefore, the predominance of normal nutritional status observed in this study reflects the generally favorable nutritional condition of elementary school children. However, the relatively high proportion of overweight and obese children warrants serious attention. The increasing prevalence of overnutrition among school-aged children may lead to long-term health risks if early interventions are not implemented. Furthermore, nutritional status is influenced by various factors, including economic, social, political,

and biological determinants.

It should also be noted that data collection was conducted during the Ramadan fasting month, which may have contributed to temporary reductions in body weight measurements and should therefore be considered when interpreting the study findings. Consequently, strengthening nutrition education, monitoring dietary habits, and optimizing school-based nutritious meal programs are important strategies for maintaining balanced nutritional status among children.

Based on the study findings, Spearman's correlation test showed that the correlation coefficient between nutritious meal program consumption behavior scores and nutritional status categories was $\rho = 0.103$, with a significance value of $p = 0.109$ ($p > 0.05$) and a sample size of $n = 241$. These results indicate that there was no statistically significant relationship between nutritious meal program consumption behavior scores and nutritional status categories, and the strength of the correlation was very weak. Therefore, the null hypothesis was accepted. Although the majority of respondents were categorized as having a high level of nutritious meal program consumption behavior, the distribution of nutritional status remained predominantly within the normal nutritional status category, accompanied by a notable proportion of overweight and obese children. This finding suggests that variations in nutritional status among respondents were not directly influenced by differences in nutritious meal program consumption behavior scores in this study.

The findings of this study are consistent with those reported with another research who found that children's dietary patterns at school do not necessarily correlate directly with nutritional status because nutritional status indicators reflect cumulative outcomes over a longer period (Permatasari et al., 2023). Stated that children's nutritional status is influenced by multiple determinants, including total daily nutrient intake, physical activity, and eating habits at home. Conceptually, these studies suggest that a single component of eating behavior within the school environment is insufficient to statistically explain variations in children's nutritional status (Moridu, Kasim, Paramata, Karim, & Daud, 2025).

These findings are also consistent with another research who emphasized that school feeding

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programs can improve the quality of dietary intake; however, changes in anthropometric indicators require a longer period of time and are influenced by household-related factors (Khan, Das, Zareen, Lassi, Salman, Raashid, & Bhutta, 2022). This conclusion is further supported with another research who reported that overweight and obesity among children are more strongly associated with total daily energy balance and sedentary lifestyles than with school meal consumption alone (Pramesthi, IWiradnyani, Anggraini, Febrihantanty, Widaryat, Waluyo, & Fahmida, 2025). In addition, the effectiveness of school-based nutrition interventions depends greatly on consumption compliance, program duration, and the family environment (Locke, James, Jones, Davies, Williams, & Brophy, 2025).

Therefore, the absence of a statistically significant relationship in this study may be explained by the fact that nutritious meal program consumption behavior represents only one supporting factor and has not emerged as the primary determinant that directly differentiates nutritional status categories among school-aged children.

CONCLUSION

The majority of respondents demonstrated good nutritious food consumption behavior within the Free Nutritious Meal Program, accounting for 156 students (64.7%). Most students had normal nutritional status (59.8%), although a notable proportion were classified as overweight (18.7%). Spearman's Rank Correlation Test yielded a correlation coefficient of 0.103 with a significance value of $p = 0.109$ ($p > 0.05$), indicating that there was no statistically significant relationship between nutritious food consumption behavior and the nutritional status of students at Gedongkiwo Elementary School. However, after receiving the Free Nutritious Meal Program 11 students who had previously been identified as being at risk of stunting, 20 students who were underweight, and 4 students who experienced wasting were classified as having normal nutritional status at the time of the study.

SUGGESTION

Future studies are recommended to explore other factors that may influence the nutritional status of elementary school students.

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