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Impact of MBG on Student Nutrition and Physical Activity in Palembang

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Abstract

Developing high-quality human resources (HR) is the key to the success of national development. Efforts to improve the quality of human resources can be achieved through the educational process. A factor contributing to educational success is the nutritional adequacy of school children, which plays a role in increasing their cognitive capacity, stamina, and learning endurance. In Indonesia, many nutritional problems are still found that negatively impact children's concentration, academic achievement, and physical fitness. As an intervention to address this issue, the government launched the Free Nutritious Meal Program (MBG) in schools. This study used a cross-sectional design. The research population consisted of students from SMPN 35 Palembang. Sampling was conducted using a purposive sampling technique with a total of 84 participants. Data analysis was performed using the paired t- test. The results showed that before the implementation of MBG, 32.1% of students had an abnormal nutritional status, which decreased to 27.4% after routine MBG administration, with a p-value = 0.32. Regarding the physical activity variable, the results before the MBG intervention showed that respondents with very low and low physical activity scores accounted for 31%, which decreased to 17.9% after receiving routine MBG, yielding a p-value = 0.00. In conclusion, there is a significant effect of MBG administration on physical activity, but not on nutritional status. It is recommended to continuously monitor and evaluate the long-term implementation of MBG to provide a positive impact on Indonesian health and education.

Keywords: Free nutritious meal (MBG), Nutritional status, Physical activity

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A. Introduction

Education is an activity in the form of a process to develop abilities, attitudes, and spirituality, encompassing mental, intellectual, and spiritual aspects (Bangun, 2016). As an effort to enlighten the nation's life, improving the quality of education is crucial for sustainable development across all aspects of human life. Educational quality can be achieved if the learning process is conducted smoothly, purposefully, and in accordance with learning objectives. One effort to improve educational quality is by building human resources (Hartati, 2016).

One indicator of human resource quality is nutritional status and physical fitness from an early age. Junior high school (SMP) students are in a critical period of growth and development physically, cognitively, and psychosocially (Soetjiningsih, 2016). Physical education, sports, and health (PJOK) is a learning process aimed at physical fitness, developing students' motor skills, and fostering a spirit of cooperation and sportsmanship (Foster et al., 2019). Physical fitness is important to consider in daily activities to improve an efficient physical endurance system (Hartati et al., 2019).

Another factor contributing to educational success is the nutritional adequacy of school children, which plays a role in enhancing their thinking power, stamina, and learning endurance (UNESCO, 2021). Balanced nutrition will have a positive impact on students' physical and brain cell development, supporting their learning process (Zul Idham et al., 2022). Adequate nutritional intake allows students to focus more on absorbing learning materials and enhances physical development, which supports motor activities and social interaction.

Based on the Indonesian Health Survey report (2023), adolescents aged 13-15 years have a nutritional status of 1.9% severely thin, 5.7% thin, 12.1% overweight, and 4.1% obese. Meanwhile, in South Sumatra, adolescents aged 13-15 years show 1.7% severely thin, 5.2% thin, 10.2% overweight, and 2.9% obese. This double burden of malnutrition can negatively impact children's concentration, academic achievement, and physical fitness (Kemenkes RI, 2023).

As an intervention effort to address this issue, the government launched the Free Nutritious Meal (MBG) Program in schools. This program provides healthy meals once a day to support students' nutritional status, health, and academic achievement (Kementerian Pendidikan, 2024).

SMP Negeri 35 Palembang is one of the schools implementing the MBG program. However, the effectiveness of this program on students' nutritional status and physical performance has not yet been scientifically evaluated. Therefore, this study was conducted to determine the effect of MBG on the nutritional status and physical activity of students at SMP Negeri 35 Palembang.

B. Methods

This study is an observational study with a cross-sectional design. The research was conducted at SMPN 35 Palembang from January to February 2026. The research population consists of all students at SMPN 35 Palembang, while the sample includes a portion of the population that meets the inclusion and exclusion criteria. Sampling was carried out using a purposive sampling method, totaling 84 participants.

Data were collected through direct measurement and interviews to determine the students' Free Nutritious Meal (MBG) status, nutritional status, and physical activity. Following data collection, the analysis consisted of univariate analysis to describe the frequency distribution of nutritional status and physical activity, and bivariate analysis to determine the effect of the MBG program on the nutritional status and physical activity of students at SMPN 35 Palembang. The

statistical analysis used was the chi-square test performed with SPSS version 20. The results are presented in the form of tables.

C. Result and Discussion

The distribution of respondents according to variable characteristics in Table 1 shows that 12 respondents (14.3%) did not receive full MBG during the study, while 72 respondents (85.7%) received full MBG throughout the research period. The students who did not receive full MBG were those with a history of school absence during the study.

Regarding the nutritional status variable before the MBG intervention, 27 respondents (32.1%) had an abnormal nutritional status, consisting of 18 underweight individuals, 8 overweight individuals, and 1 obese individual, while 57 respondents (67.9%) possessed a normal nutritional status classified as healthy weight. Meanwhile, following the MBG intervention, 23 respondents (27.4%) were found to have an abnormal nutritional status, comprising 14 underweight individuals, 8 overweight individuals, and 1 obese individual, whereas 61 respondents (72.6%) fell into the normal nutritional status and healthy weight category. This indicates an increase in the number of respondents with normal nutritional status and a decrease in those with abnormal nutritional status.

Table 1. Distribution of Respondents by Variable Characteristics

Variabel	Frekuensi (N)	Persentase (%)
Free Nutritious Meal (MBG) Status		
- Incomplete (Non-full)	12	14,3
- Complete (Full)	72	85,7
Nutritional Status before MBG Intervention		
- Abnormal (Underweight, Overweight, Obese)	27	32,1
- Normal (Healthy Weight)	57	67,9
Nutritional Status after MBG Intervention		
- Abnormal (Underweight, Overweight, Obese)	23	27,4
- Normal (Healthy Weight)	61	72,6
Physical Activity Level before MBG Intervention		
- Low (Very Low & Low)	26	31,0
- Moderate to High (Moderate, High, Very High)	58	69,0
Free Nutritious Meal (MBG) Status		
- Incomplete (Non-full)	15	17,9
- Complete (Full)	69	82,1

Source: Data Processing Results (2026)

The results of the analysis regarding the effect of MBG administration on nutritional status revealed that 12 respondents did not receive full MBG during the study period, among whom 8 individuals had an abnormal nutritional status and 4 individuals had a normal nutritional status. Meanwhile, 72 respondents received full MBG throughout the study period, consisting of 18 individuals with an abnormal nutritional status and 54 individuals with a normal nutritional status. Based on the paired t-test results, a p-value of 0.32 ($p > 0.05$) was obtained. This indicates that there is no significant effect of MBG administration on nutritional status.

The analysis of the effect of MBG administration on physical activity showed that among the 12 respondents who did not receive full MBG during the study period, 7 individuals fell into the very low to low physical activity category, and 5 individuals fell into the moderate to very high physical activity category. Conversely, out of the 72 respondents who received full MBG throughout the study period, 13 individuals exhibited very low to low physical activity, while 59 individuals demonstrated moderate to very high physical activity. Based on the paired t-test results, a p-value of 0.00 ($p < 0.05$) was achieved. This indicates that MBG administration has a significant effect on physical activity.

Table 2. Bivariate Analysis of the Effect of Free Nutritious Meal (MBG) on Nutritional Status and Physical Activity

Variable	MBG Incomplete		MBG Complete		Total		OR	*Pvalue*
	n	%	n	%	n	%	(95% CI)	
Nutritional Status								
Abnormal	8	66,7	18	25	26	31	6,000	0,011
Normal	4	33,3	54	75	58	69	(1,613-22,313)	
Physical Activity								
Very Low to Low	7	58,3	13	18,1	20	23,8	6,354	0,008
Moderate to Very High	5	41,7	59	81,9	64	76,2	(1,740-23,204)	

Source: Data Processing Results (2026)

Discussion

The provision of the Free Nutritious Meal (MBG) program significantly influences both nutritional status and physical activity. Children who routinely consume balanced meals—consisting of carbohydrates, proteins, healthy fats, vitamins, and minerals—tend to be more active and possess higher learning motivation. Adequate nutritional intake supports brain tissue formation and strengthens nerve cell functions, which directly impacts a child's cognitive ability and concentration in school (Rahman et al., 2022).

Balanced nutrition enhances a child's capacity for physical activities, such as playing, running, cycling, or exercising, which in turn affects their nutritional status. Individuals must maintain sufficient physical activity to balance energy expenditure and intake; adequate physical activity significantly reduces the risk of obesity (Rafaely & Dheni, 2025). Based on the results of this study regarding the influence of MBG on nutritional status, it was found that abnormal nutritional status (underweight, overweight, and obesity) occurred more frequently among students who did not routinely receive MBG (66.7%).

Furthermore, a significant correlation exists between the provision of MBG and nutritional status (p-value = 0.011). This aligns with research by Najdah et al. (2024) in West Sulawesi concerning adolescent eating habits and nutritional status. Their findings indicated that adolescents with healthy eating habits had a lower prevalence of being overweight or obese (18.9%), whereas those with unhealthy habits showed a relatively higher incidence (24.1%). These results are also supported by

Bede et al. (2020) in Cameroon, which highlighted a high prevalence of malnutrition among students with irregular eating patterns. This was attributed to poor dietary practices, such as excessive snacking, skipping meals, and low consumption of fruits, vegetables, milk, and meat.

Another study conducted by Nasrul et al. (2025) among school-aged children in Bogor also showed similar results. The research findings showed a relationship between food consumption and the nutritional status of school-aged children. 75% of the study's respondents had poor dietary patterns, and it was found that 41.7% of them had abnormal nutritional status, including both obesity and underweight. This is caused by children's tendency to consume unregulated snacks consuming foods that do not meet nutritional balance guidelines, and irregular eating habits. Without proper supervision, these eating habits can lead to long-term health complications.

Growth and development in children are marked by changes in lifestyle and dietary patterns. However, children often have limited understanding of the importance of consuming nutritious food, making school-aged children highly vulnerable to nutritional issues.

Meeting a child's nutritional needs is a major concern because they require specific nutrients for proper growth and development. Nutritional problems in children are largely caused by poor dietary habits, such as an imbalance between actual intake and recommended nutritional requirements. Deficiencies in energy and protein can lead to conditions such as obesity, chronic energy deficiency (malnutrition), and anemia (Ade et al., 2024).

Meeting a child's nutritional needs is achieved through the consumption of healthy and nutritious food. Regular monitoring of nutritional status serves as a crucial first step in preventing issues and improving overall health. Nutritional requirements for children, particularly those of school age, are higher because they are in a phase of accelerated growth, especially in height (Hanim et al., 2022). Ensuring these needs are met is key to maintaining a normal nutritional status, which is influenced by factors such as eating habits, dietary patterns, and the pocket money provided by parents (Gerungan et al., 2023).

Fulfilling a child's daily nutritional needs plays a vital role in improving health and learning motivation. To address nutritional issues that hinder human resource development, the government has implemented a Free Nutritious Meal (MBG) policy. This policy aims to enhance the quality of education, health,

and community welfare. The program is designed to help meet children's daily nutritional requirements, reduce stunting rates, and encourage better school attendance and concentration (Merlinda & Yusmar, 2025).

Hana et al. (2025) conducted a literature study analyzing the effectiveness of Free Nutritious Meals (MBG) for school children. The results showed positive impacts, including increased learning motivation and student attendance. Schools reported that students were more enthusiastic and showed improved learning activity after receiving nutritious meals. Additionally, parents felt supported as they no longer needed to provide money for lunch, which reduced the habit of buying unhealthy snacks.

Research on the relationship between MBG and physical activity revealed that 58.3% of students who did not routinely receive MBG had very low to low physical activity levels. Bivariate analysis showed a significant correlation between MBG provision and physical activity (p-value = 0.008). This aligns with a study by Yustina & Yoessy (2026) in Bogor regarding dietary patterns and physical activity in college students, which found that those with poor dietary patterns also had lower physical activity, while those with good dietary patterns engaged in heavy physical

activity.

Similar results were found by Laras (2022) at the University of Semarang, showing a significant relationship between dietary patterns, physical activity, and nutritional status. The study found that respondents with irregular eating habits and low physical activity were more at risk of being overweight. This indicates that balancing food intake and energy expenditure through physical activity is crucial for body condition (Nabawiyah et al., 2023), where increased activity derived from nutritional adequacy also contributes to student learning outcomes (Hartati et al., 2020).

These findings demonstrate the influence of MBG on nutritional status and physical activity. Consuming food according to energy needs impacts both status and activity levels. A body that receives full nutrients allows for proper physical development, brain growth, activity skills, and general health (Fitria & Rahayu, 2023).

Studies by several international institutions show that school MBG programs can reduce stunting prevalence by 10-15% over the next 3-5 years. Daily access to nutritious food helps previously undernourished children achieve better balance, supporting optimal height growth and brain development (Hana et al., 2025). A properly implemented MBG program can also help reduce obesity prevalence by providing healthier meals and controlled portions. It prevents children from consuming excessive fast food and items high in sugar and fat, which can cause early-onset health issues like diabetes, hypertension, and heart disease (Qomarullah et al., 2025).

Although the short-term effects may not yet be visible, these controlled dietary patterns are expected to develop healthier eating habits, contributing to lower obesity rates, improved general health, and better immune systems, as evidenced by reduced absenteeism due to illness (Bhutta et al., 2020).

D. Conclusion

The results above demonstrate the influence of providing Free Nutritious Meals (MBG) on nutritional status and physical activity. When the body receives full nutrients according to its needs, it maintains a good nutritional status, enabling physical development, brain growth, activity skills, and overall health. The daily availability of nutritious food helps children who were previously undernourished to obtain better and more balanced nutrition.

The long-term implementation of the MBG program will have a significant impact on health and education in Indonesia. Access to nutritious food at school can improve concentration, learning motivation, and academic achievement, which will play a crucial role in educational sustainability and the development of high-quality human resources.

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F. Conflict of Interest

No conflict of interest.

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