

THE EFFECT OF THE GOVERNMENT'S FREE NUTRITIOUS FOOD PROGRAM ON CHANGES IN LEARNING CONCENTRATION AND NUTRITIONAL STATUS IN STUDENTS OF SDN NO. 075062 DOLI-DOLI MANDREHE DISTRICT, WEST NIAS REGENCY

Ernawati Hondro^{1*}, Ermi Girsang², Sri Lestari Ramadhani Nasution³

¹ Postgraduate Program in Public Health, Universitas Prima Indonesia, Medan, Indonesia

^{2,3,4} Department of Public Health, Universitas Prima Indonesia, Medan, Indonesia

^{2,3,4} COE for Degenerative Disorders and Integrated Health, Universitas Prima Indonesia, Medan, Indonesia

Email : ernahondro88@gmail.com

Email: ermigirsang@unprimdn.ac.id

Email : srilestariramadhaninasution@unprimdn.ac.id

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Abstract

This study aims to analyze the effect of the Government's Free Nutritious Food Program (MBG) on changes in learning concentration and nutritional status among students at SDN No. 075062 Doli-Doli, Mandrehe District, West Nias Regency. This research used a quantitative, quasi-experimental design with a pretest and posttest (no control group). The population consisted of 168 students, with a sample of 128 students selected using the Slovin formula and purposive sampling. Learning concentration was measured using a structured test, while nutritional status was assessed using Body Mass Index (BMI) based on anthropometric measurements. Data were analyzed using univariate methods and the Wilcoxon signed-rank test due to non-normal distributions. The results showed a significant increase in learning concentration (from pretest 30.19 to posttest 34.91; $p < 0.001$) and nutritional status (from pretest 15.33 to posttest 16.17; $p < 0.001$). These findings indicate that the MBG program significantly improves students' cognitive performance and nutritional status. The study concludes that school-based nutrition interventions are effective in supporting both health and educational outcomes, particularly in disadvantaged areas.

Keywords: *Concentration, Elementary Students, Free Nutritious Food Program, Nutritional Status, School Feeding.*

INTRODUCTION

The issue of child nutrition remains a critical concern at both global and national levels due to its strong relationship with cognitive development, learning outcomes, and long-term human capital formation, particularly among primary school students who are in a crucial phase of physical and intellectual growth (Bank, 2022; FAO, 2023; Fund, 2022; WHO, 2021). Recent evidence indicates that inadequate nutritional intake significantly contributes to impaired cognitive function, reduced attention span, and poor academic performance among school-aged children (Adolphus et al., 2022; Nyaradi et al., 2021; Prado & Dewey, 2021). In the Indonesian context, the persistence of malnutrition problems such as stunting, wasting, anemia, and even overnutrition reflects ongoing structural challenges related to food security and dietary diversity, particularly in rural and underserved areas (Bappenas, 2023; Kemenkes RI, 2023; SSGI, 2024; WHO & UNICEF, 2022). These conditions indicate that limited access to balanced nutrition continues to affect children's health and educational development, underscoring the need for comprehensive, sustainable interventions. Empirical findings show that children experiencing undernutrition tend to demonstrate lower concentration levels and reduced academic engagement compared to their well-nourished peers (Aurino et al., 2022; Bundy et al., 2022; Cohen et al., 2021). In response to these challenges, school feeding programs have been widely implemented globally as an effective intervention to improve both nutritional status and educational outcomes (Drake et al., 2021; Gelli et al., 2022; Kristjansson et al., 2021; Program, 2022). In Indonesia, the Government's Free Nutritious Food Program (MBG), initiated in 2025, represents a strategic policy aimed at improving children's nutritional intake, enhancing learning capacity, and supporting the national vision of developing a healthy and productive generation (Fasha & Tesniyadi, 2024; Gunadi et al., 2025; Nida & Sari, 2023; Press, 2025). From a physiological perspective, adequate intake of macronutrients and micronutrients plays a vital

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Ernawati Hondro et al

role in brain metabolism, neurotransmitter function, and cognitive performance, which directly influence students' concentration during learning activities (Georgieff, 2022; Gómez-Pinilla, 2021; Prado & Dewey, 2021). Short-term nutritional intake, particularly glucose availability, has been shown to affect attention and memory processes within 30 minutes to 2 hours after consumption (Adolphus et al., 2022; Hoyland et al., 2021). School meal programs have been proven to increase school attendance, participation, and academic achievement, particularly among children from low-income households (Aurino et al., 2022; Gelli et al., 2022). Despite strong theoretical and empirical support, there remains limited research in Indonesia that simultaneously examines the impact of government-led free nutritious food programs on both learning concentration and nutritional status using a pre-post intervention design. This gap highlights the importance of conducting context-specific studies, particularly in rural settings such as SDN No. 075062 Doli-Doli, Mandrehe District, West Nias Regency, where preliminary observations indicate low body mass index and poor concentration during learning among students.

This study aims to analyze the effect of the Government's Free Nutritious Food Program on changes in students' learning concentration and nutritional status using a quasi-experimental approach. Theoretically, this research contributes to advancing public health and educational sciences by strengthening empirical evidence on the relationship between nutrition and cognitive performance among school-aged children (Georgieff, 2022; Nyaradi et al., 2021; Prado & Dewey, 2021). In practice, the findings are expected to provide policymakers, educators, and health practitioners with evidence-based recommendations to optimize school-based nutrition interventions and improve student learning outcomes. The results of this study indicate that implementing the MBG program significantly improves students' learning concentration and nutritional status, as evidenced by statistical analysis showing significant differences before and after the intervention ($p < 0.05$). These findings imply that school feeding programs should be sustained and expanded as an integrated strategy to address both educational and nutritional challenges, particularly in disadvantaged regions, while ensuring program quality, sustainability, and alignment with local food systems and community needs (Bank, 2022; FAO, 2023; Gelli et al., 2022).

METHOD

This study employed a quantitative, quasi-experimental design with a pretest and posttest, without a control group, to assess the effect of the Government's Free Nutritious Food Program (MBG) on students' learning concentration and nutritional status. This design was selected because the intervention was implemented as part of a government program; thus, the researchers did not have full control over treatment allocation. The research was conducted at SDN No. 075062 Doli-Doli, Mandrehe District, West Nias Regency. The study population comprised all 168 students enrolled at the school. The sample size was determined using the Slovin formula and adjusted for inclusion criteria, resulting in 128 students from grades III to VI participating in the study. The sampling technique used was purposive, focusing on students actively involved in the MBG program during the research period. The independent variable in this study was the implementation of the Free Nutritious Food Program (MBG), while the dependent variables were learning concentration and nutritional status. Learning concentration was operationally defined as students' ability to focus during the learning process. It was measured using a structured concentration test instrument with ordinal categories (low, moderate, high). Nutritional status was defined as the physical condition resulting from the balance between nutrient intake and body needs, measured using anthropometric indicators, including body weight and height to calculate Body Mass Index (BMI) according to age standards.

Data collection techniques involved both primary and secondary data. Primary data were obtained through direct measurement of students' anthropometric data and assessment of learning concentration using standardized instruments. Secondary data were collected from school records and documentation related to the implementation of the MBG program. The instruments used included a concentration test sheet and anthropometric tools such as a digital weighing scale and a microtoise for height measurement. Data analysis was conducted in two stages. First, univariate analysis was performed to describe the characteristics of respondents and summarize the distribution of each variable. Second, bivariate analysis was conducted to determine the effect of the MBG program on changes in learning concentration and nutritional status. Prior to hypothesis testing, data normality was assessed using the Kolmogorov-Smirnov test. Since the data were not normally distributed ($p < 0.05$), the Wilcoxon signed-rank test was applied to compare pretest and posttest results. Statistical significance was determined at a 95% confidence level ($\alpha = 0.05$).

RESULTS AND DISCUSSION

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Ernawati Hondro et al

The characteristics of the research respondents showed that out of 128 students, the majority were male (53.1%) and the rest were female (46.9%). Based on age distribution, most respondents were 11 years old (30.5%), followed by 10 years (24.2%), 9 years (19.5%), 12 years (15.6%), 8 years (9.4%), and a small proportion aged 13 years (0.8%). These findings indicate that the respondents were within the typical age range of elementary school students, which is a critical period for both physical growth and cognitive development.

No	Characteristics	F	%
1	Gender		
	Boys	68	53,1
	Girls	60	46,9
2	Ages (Year)		
	8	12	9,4
	9	25	19,5
	10	31	24,2
	11	39	30,5
	12	20	15,6
	13	1	0,8
	Total	128	100

Table 1. Respondent Characteristics

The descriptive analysis results showed an increase in both learning concentration and nutritional status after the implementation of the Free Nutritious Food Program (MBG). The mean score of learning concentration increased from 30.19 (SD ± 6.10) in the pretest to 34.91 (SD ± 4.96) in the posttest. Similarly, the average nutritional status improved from 15.33 (SD ± 2.17) before the intervention to 16.17 (SD ± 2.22) after the intervention. These findings indicate a positive trend in both cognitive and physical health indicators following the program.

Variabel	Mean	SD	Min	Max
Study concentration				
Pretest	30,19	6,10	23,00	47,00
Posttest	34,91	4,96	29,00	48,00
Nutritional status				
Pretest	15,33	2,17	10,38	23,19
Posttest	16,17	2,22	11,83	24,68

Table 2. Average Learning Concentration and Nutritional Status of Students.

Prior to hypothesis testing, the normality of the data was assessed using the Kolmogorov–Smirnov test, which showed that the data were not normally distributed ($p < 0.001$). Therefore, a nonparametric test, namely the Wilcoxon signed-rank test, was used to analyze differences between pretest and posttest results. The results revealed a statistically significant difference in learning concentration, with a Z value of -9.732 and $p < 0.001$. Similarly, nutritional status also showed a significant improvement with a Z value of -8.404 and $p < 0.001$. These results indicate that the MBG program had a significant effect on both variables.

Variabel	Mean Rank	Z	Nilai p
Study concentration			
Pretest	14,50	-9,732	<0,001
Posttest	64,89		
Nutritional status			
Pretest	37,19	-8,404	<0,001
Posttest	64,93		

Table 3. The Effect of the Government's Free Nutritious Food Program on Changes in Learning Concentration and Nutritional Status in Students.

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Ernawati Hondro et al

The findings confirm that the Government's Free Nutritious Food Program significantly improves students' learning concentration and nutritional status. Improved concentration indicates better cognitive performance, particularly in attention and focus, while enhanced nutritional status reflects improved energy balance, which is essential for growth and health. These results are consistent with existing evidence that adequate nutrient intake supports brain metabolism, cognitive function, and learning readiness. School feeding programs contribute to stable energy availability, which enhances students' engagement during classroom activities. Practically, the MBG program not only improves students' nutritional status but also enhances learning quality, participation, and academic potential, especially in disadvantaged areas. However, the study is limited by the absence of a control group and the lack of control over external factors. Future research is recommended to use more rigorous designs. Overall, the MBG program is an effective intervention and should be sustained and expanded to improve child health and educational outcomes.

CONCLUSION

This study concludes that the Government's Free Nutritious Food Program (MBG) has a significant positive effect on improving students' learning concentration and nutritional status. The findings indicate that adequate nutritional intake plays an important role in enhancing cognitive performance and supporting physical growth among elementary school students.

The practical implication of this study suggests that school-based nutrition programs should be sustained and expanded as an effective strategy to improve both health and educational outcomes, particularly in rural and disadvantaged areas. Policymakers, educators, and health practitioners are encouraged to strengthen program implementation, ensure food quality, and integrate nutrition interventions with educational strategies. This study has several limitations, including the use of a quasi-experimental design without a control group and limited control over external factors such as family environment and individual health conditions. These limitations may affect the generalizability and causal interpretation of the findings.

Future research is recommended to apply more rigorous experimental designs, include control groups, and consider additional variables such as socioeconomic factors, dietary patterns, and long-term academic outcomes. Further studies are also needed to evaluate the program's sustainability and broader impact across different regions.

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THE EFFECT OF THE GOVERNMENT'S FREE NUTRITIOUS FOOD PROGRAM ON CHANGES IN LEARNING CONCENTRATION AND NUTRITIONAL STATUS IN STUDENTS OF SDN NO. 075062 DOLI-DOLI MANDREHE DISTRICT, WEST NIAS REGENCY

Ernawati Hondro *et al*

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