

# Enhancing Community Nutrition Literacy through Education on the Effectiveness of the Free Nutritious Meals (MBG) Program in Bogor Regency

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**Abstract.** Nutrition literacy is an important component in supporting community understanding of healthy dietary practices and the implementation of nutrition-related public programs. The Free Nutritious Meals (Makan Bergizi Gratis/MBG) Program represents a strategic national initiative aimed at supporting nutritional fulfillment and human resource development in Indonesia. However, the effectiveness of such a program depends not only on the provision of nutritious meals but also on community understanding, food quality, dietary diversity, food safety, and active stakeholder participation. This community service activity aimed to strengthen community nutrition literacy through educational outreach and mentoring concerning the MBG Program in Bogor Regency. The activity employed a participatory approach involving 68 community participants. The intervention consisted of nutrition education, interactive discussions, question-and-answer sessions, practical examples, and mentoring related to balanced nutrition, dietary diversity, food safety, MBG objectives, program implementation, and indicators of program effectiveness. Participants' knowledge was evaluated using pre-test and post-test assessments. The results demonstrated an increase in the mean knowledge score from 65.4 before the intervention to 88.2 after the intervention, representing an increase of 22.8 points or 34.86%. The findings indicate that the educational intervention contributed positively to participants' understanding of nutrition literacy and the MBG Program. The activity also strengthened participants' awareness of the importance of community participation in supporting healthy dietary practices and monitoring program implementation. Nevertheless, the improvement primarily reflects changes in knowledge and does not directly demonstrate long-term behavioral or nutritional outcomes. Continued education, mentoring, and follow-up evaluation are therefore recommended to sustain nutrition literacy and strengthen community participation in supporting the effective and accountable implementation of the MBG Program.

**Keywords:** Nutrition Literacy; Free Nutritious Meals; Community Empowerment; Nutrition Education

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## 1. Introduction

Adequate nutritional intake is one of the fundamental foundations of human resource development, as good nutritional status is closely associated with physical growth, cognitive development, health, learning capacity, and future productivity. Nutritional problems among children and families are not limited to inadequate food intake but also encompass diet quality, dietary diversity, micronutrient adequacy, food safety, and knowledge and behavior related to food selection and consumption. These conditions make nutrition literacy an important component of efforts to improve public health. Knowledge of food composition, nutritional requirements, balanced nutrition principles, food safety, and the ability to understand nutrition-related information can influence consumption decisions at both the individual and household levels. Therefore, nutrition interventions should not rely solely on food provision but should also be accompanied by education that enables communities to understand

the rationale, benefits, and practical ways of adopting healthy dietary patterns. The urgency of improving nutrition literacy is further underscored by the complex nature of nutritional problems among children. Within a population, children may simultaneously experience undernutrition, micronutrient deficiencies, and overnutrition. Empirical evidence indicates that dietary diversity is an important indicator of nutritional adequacy. A study of children aged 6–23 months in Indonesia found that dietary diversity was associated with maternal education, access to information, and household socioeconomic conditions, indicating that improving nutrition knowledge and access to nutritional information is an important component of interventions aimed at improving dietary practices [1]. An experimental study in Indonesia also demonstrated that nutrition education can improve knowledge, self-efficacy, and complementary feeding practices, while contributing to improvements in indicators of child undernutrition [2]. These findings indicate that community-based nutrition education has the potential to strengthen the impact of food-based interventions through improvements in knowledge and behavior.

One approach widely implemented in various countries to improve food access and support children's nutritional status is the school feeding program. Such programs serve not only as food-based interventions but also as platforms for integrating nutrition education, health, hygiene, education, and social protection. A systematic review and meta-analysis of school feeding programs in low- and middle-income countries found that school feeding can improve children's height and weight as well as school attendance [3]. Other evidence suggests that school feeding programs can contribute to improvements in diet quality, food security, meal participation, and several educational outcomes, although the magnitude of these effects may vary according to program design, implementation quality, socioeconomic context, and beneficiary characteristics [4]. The effectiveness of school feeding programs is also not uniform across all health outcomes. For example, a cluster randomized trial in Ghana found that a nationally implemented school feeding program did not produce the same effects across all groups of children but was associated with improvements in height-for-age, particularly among children aged 5–8 years, girls, and children from poor households [5]. Meanwhile, research in Uganda showed that a school feeding program providing micronutrient-fortified food reduced the prevalence of anemia among adolescent girls and other vulnerable groups [6]. Research in Kenya also demonstrated that school feeding can improve school attendance, while supplementation with animal-source foods in school feeding programs was associated with improvements in children's growth, cognitive function, and behavior [7], [8].

Beyond health outcomes, school feeding programs have the potential to generate educational benefits. A systematic review of school feeding programs in Africa found positive associations between school feeding and various educational indicators, including attendance and learning outcomes [9]. Another systematic review of universal free school meal programs found that such programs consistently increased student participation in school meal consumption, while several studies also indicated potential improvements in diet quality, food security, academic performance, and selected health outcomes [4]. More recent evidence suggests that the implementation of universal free school meal programs is associated with increased meal participation and potentially improved student attendance, although the certainty of evidence for some outcomes remains limited [10]. Therefore, the success of nutrition-focused meal programs should be understood multidimensionally, rather than being assessed solely on the basis of the quantity of food distributed. Other important dimensions include menu quality, nutrient adequacy, food acceptability, behavioral changes, food utilization, and monitoring and evaluation mechanisms.

In the Indonesian context, previous experiences with various food provision and nutrition intervention programs offer important lessons for the development of the Free Nutritious Meals (Makan Bergizi Gratis/MBG) Program. One relevant source of national evidence comes from the evaluation of the School Nutrition Program (Program Gizi Anak Sekolah/ProGAS). A study involving 454 elementary school students from 24 schools across several provinces in Indonesia found that the program improved dietary diversity, meal frequency, handwashing practices with soap, and students' nutrition knowledge [11]. However, the study also found that changes in nutritional status and the intake of certain nutrients were not statistically significant, while the implementation of nutrition education and program monitoring still needed to be strengthened. These findings are important because they demonstrate that food provision alone does not automatically result in improvements in nutritional status; menu quality, nutrition education, implementation capacity, and monitoring systems are integral components of program success [12]. This context has become increasingly relevant following the Indonesian government's designation of MBG as a strategic national policy. Institutionally, Presidential Regulation of the Republic of Indonesia Number 83 of 2024 concerning the National Nutrition Agency (Badan Gizi Nasional) established the

National Nutrition Agency (BGN) as a government institution under and accountable to the President, with the mandate to implement national nutrition fulfillment. The regulation provides an institutional foundation for coordination, formulation of technical policies, implementation, monitoring, and supervision of national nutrition fulfillment. Thus, MBG is not merely a food distribution initiative but forms part of the national nutrition fulfillment policy that requires governance, coordination, oversight, and the participation of multiple stakeholders.

The framework for MBG implementation was subsequently strengthened through Presidential Regulation of the Republic of Indonesia Number 115 of 2025 concerning the Governance of the Implementation of the Free Nutritious Meals Program. This regulation provides legal direction and certainty for MBG implementation and governs aspects of program implementation, monitoring, supervision, control, evaluation, reporting, financing, and procurement of goods and services. The regulation demonstrates that the success of MBG depends not only on the availability of nutritious food but also on the quality of governance and the capacity of all stakeholders to understand, implement, monitor, and evaluate the program. Therefore, community literacy regarding the objectives, target beneficiaries, nutritional principles, food quality, food safety, implementation mechanisms, and indicators of MBG effectiveness is essential for supporting the program's accountability and sustainability. This need is particularly relevant in Bogor Regency, which has a large population and faces challenges related to health development and the acceleration of stunting reduction. The Bogor Regency Government has reported various efforts to implement convergent nutrition interventions, including strengthening education, growth monitoring, specific and sensitive nutrition interventions, and cross-sectoral coordination. Data and stunting prevalence figures reported by local authorities may differ depending on the source and measurement methodology; therefore, such figures should be interpreted carefully and with reference to the relevant official sources. The Bogor Regency Government has emphasized improving the quality of nutrition interventions and community empowerment as important components of efforts to accelerate stunting reduction. At the national level, the 2024 Indonesian Nutrition Status Survey (SSGI) recorded a national stunting prevalence of 19.8%, down from 21.5% in 2023; however, the government continues to face the need to strengthen nutrition interventions in a sustainable manner.

Under these circumstances, communities should not be positioned merely as beneficiaries but also as actors who need the capacity to understand and oversee program implementation. Nutrition literacy can help communities assess whether the food provided adheres to the principles of dietary diversity, balance, adequacy, and food safety. Such literacy also enables parents, health cadres, teachers, and community members to understand that the success of MBG should not be measured solely by whether meals are distributed free of charge, but also by consumption quality, food acceptability, changes in knowledge and behavior, beneficiaries' health, and the consistency of program governance. Research on strategies to increase school meal consumption indicates that menu acceptability, compatibility with local tastes and food culture, adequate eating time, and the eating environment are important factors in ensuring that the food provided is actually consumed by beneficiaries [4]. At the same time, it is important to emphasize that MBG is a relatively new program, and empirical evidence regarding its long-term effectiveness in Indonesia is still emerging. Early implementation research on MBG indicates that the program has considerable potential to improve human resource quality, but its direct effects on stunting and anemia cannot yet be conclusively determined without an adequate outcome monitoring system [13]–[15]. Therefore, community education should avoid oversimplifying the assumption that MBG will automatically reduce stunting or improve academic achievement. Instead, communities need to develop an evidence-based understanding of the program's objectives, mechanisms of benefit, factors supporting its success, indicators that can be used to assess effectiveness, and the limitations of the available evidence.

Based on these considerations, this community service activity was conducted through community nutrition literacy assistance and educational outreach on the effectiveness of the Free Nutritious Meals (MBG) Program in Bogor Regency. The activity aims to improve community understanding of balanced nutrition, the objectives and target beneficiaries of MBG, the potential benefits of the program for health and human resource development, the principles of selecting nutritious and safe foods, and the indicators that communities can use to understand and critically assess MBG implementation. The assistance-based approach was selected because improving nutrition literacy cannot be achieved solely through one-way information delivery but requires dialogue, clarification, discussion, and the strengthening of community capacity to connect nutrition information with everyday dietary practices. Thus, this activity has a strategic role as a form of university contribution to supporting the implementation of national policy through community capacity building. The assistance is expected not only to improve participants' knowledge of MBG but also to foster critical and participatory attitudes toward supporting

program implementation. Ultimately, improving community nutrition literacy is expected to strengthen the social ecosystem surrounding MBG implementation so that the program goes beyond food distribution and develops into an instrument for education, empowerment, social oversight, and increased public awareness of the importance of adequate, high-quality, and sustainable nutrition.

## 2. Method

This community service activity employed a participatory approach through nutrition literacy education and mentoring, with a focus on enhancing community understanding of the Free Nutritious Meals (Makan Bergizi Gratis/MBG) Program. The activity was conducted in Bogor Regency and involved community members as the primary participants, particularly parents, health cadres, and community members concerned with family and child nutrition. Participants were selected purposively based on their involvement in and concern for family nutrition, child health, and the implementation of the MBG Program. The participatory approach positioned participants not merely as recipients of information but also as active partners in discussions, problem identification, and understanding program implementation.

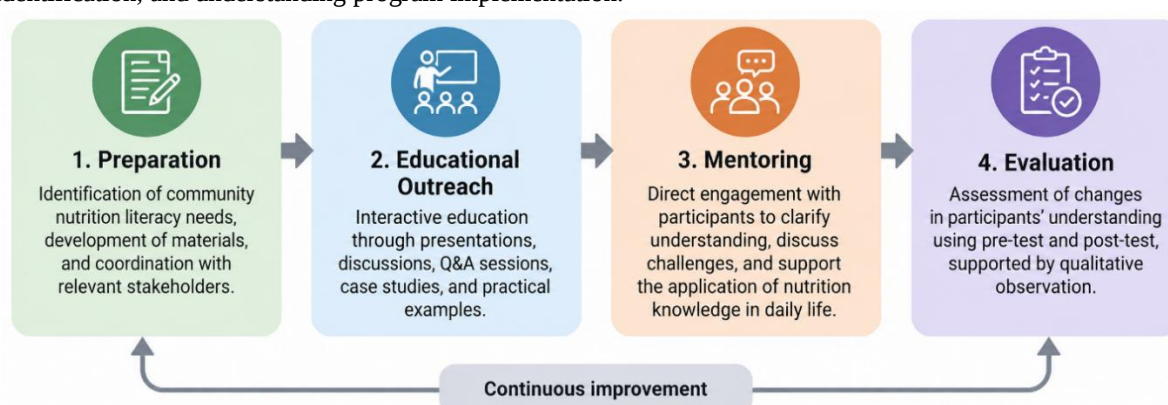


Figure 1. Stages of the Community Nutrition Literacy Assistance Program

The activity was conducted through several interconnected stages, namely preparation, educational outreach, mentoring, and evaluation. The preparation stage began with an assessment of community nutrition literacy needs through preliminary observations and communication with relevant stakeholders at the activity site. The findings from this assessment were used to determine materials appropriate to the characteristics of the participants and local needs. The community service team subsequently developed educational materials covering the basic concepts of balanced nutrition, the importance of dietary diversity, nutritional requirements, food safety, the objectives and target beneficiaries of the MBG Program, MBG implementation mechanisms, the program's potential benefits, and indicators that can be used to understand program effectiveness. The materials were also developed based on the national policy framework, particularly Presidential Regulation of the Republic of Indonesia Number 83 of 2024 concerning the National Nutrition Agency and Presidential Regulation of the Republic of Indonesia Number 115 of 2025 concerning the Governance of the Implementation of the Free Nutritious Meals Program.

The implementation stage involved interactive educational sessions combining material presentations, discussions, question-and-answer sessions, simple case studies, and examples of applying nutrition principles in everyday life. The MBG-related materials were designed not only to explain the objectives of the program but also to enhance participants' ability to understand the factors that determine program effectiveness, including menu quality and diversity, nutrient adequacy, food safety, food acceptability, consumption levels, targeting accuracy, monitoring, and program evaluation. Participants were informed that the effectiveness of MBG should be assessed multidimensionally rather than solely on the basis of the quantity of food distributed. The educational sessions also emphasized the important role of families and communities in ensuring that the nutritious food provided is properly consumed and integrated into healthy dietary practices within the household. The mentoring stage was conducted through direct interaction with participants following the educational sessions. The mentoring process was designed to help participants relate the information they had acquired to their everyday dietary conditions and practices. Participants were encouraged to identify nutritional problems observed within their families and communities, discuss challenges in adopting nutritious dietary patterns, and identify forms of

community participation that could support the implementation of MBG. At this stage, the community service team provided clarification regarding participants' understanding of food nutritional content, balanced meal principles, food safety, and indicators of program success. The mentoring process also aimed to address misconceptions about MBG, particularly the assumption that the provision of free meals automatically guarantees the achievement of good nutritional status.

The evaluation was conducted to assess changes in participants' understanding after they had participated in the educational and mentoring activities. The evaluation employed a pre-test and post-test approach administered before and after the activity. The evaluation instrument consisted of several questions measuring participants' understanding of balanced nutrition, dietary diversity, food safety, the objectives and target beneficiaries of MBG, the program's benefits, factors influencing MBG effectiveness, and the role of communities in supporting and overseeing program implementation. In addition to quantitative evaluation through the pre-test and post-test, qualitative evaluation was also conducted through observations of participants' levels of engagement during discussions, their ability to answer questions, and their ability to identify examples of applying nutrition principles in everyday life. The pre-test and post-test data were analyzed descriptively by comparing participants' levels of understanding before and after the activity. The increase in the mean score between the pre-test and post-test was used as an indicator of changes in participants' knowledge following the educational intervention. Data obtained from discussions and observations of participant engagement were analyzed descriptively to provide an overview of participants' responses, understanding, and involvement throughout the activity. The evaluation findings were subsequently used to assess the achievement of the activity objectives, particularly in improving nutrition literacy and community understanding of the effectiveness of MBG. This evaluation approach enabled the community service activity not only to document the implementation process but also to provide an overview of changes in community knowledge and capacity following the educational and mentoring intervention.

### 3. Results

The community service activity on nutrition literacy regarding the Free Nutritious Meals (Makan Bergizi Gratis/MBG) Program in Bogor Regency was attended by 68 participants. The activity focused on strengthening community understanding of balanced nutrition, dietary diversity, food safety, and the objectives and implementation of the MBG Program. Participant involvement throughout the activity was reflected in their active participation in the educational sessions, discussions, question-and-answer sessions, and responses to issues related to nutrition and the implementation of MBG.



Figure 2. Community Nutrition Literacy Education and Mentoring Activity

Following the implementation of the community nutrition literacy education and mentoring activities presented in Figure 2, an evaluation was conducted to assess changes in participants' understanding of nutrition and the Free Nutritious Meals (MBG) Program. Participants completed a pre-test before the educational session and a post-test after the intervention. The assessment covered key aspects of nutrition literacy, including balanced nutrition, dietary diversity, food safety, the objectives and target beneficiaries of MBG, the potential benefits of the program, factors influencing its effectiveness, and the role of the community in supporting program implementation. A comparison of the participants' pre-test and post-test scores is presented in Table 1.

Table 1. Comparison of Participants' Nutrition Literacy Scores Before and After the Intervention

| Evaluation | Number of Participants | Mean Score | Score Increase | Percentage Increase |
|------------|------------------------|------------|----------------|---------------------|
| Pre-test   | 68                     | 65.4       | —              | —                   |
| Post-test  | 68                     | 88.2       | 22.8           | 34.86%              |

The results demonstrate an increase in the participants' average knowledge score following the nutrition literacy activity. The mean score increased from 65.4 in the pre-test to 88.2 in the post-test, representing an improvement of 22.8 points or 34.86% relative to the initial score. This increase indicates that participants acquired a better understanding of the nutritional concepts and information concerning the MBG Program presented during the activity. The improvement in scores also indicates that the educational intervention was able to strengthen participants' understanding of nutrition beyond the basic concept of food provision. Participants were introduced to the importance of dietary diversity, nutrient adequacy, food safety, food acceptability, and appropriate consumption. The discussion further emphasized that the effectiveness of MBG should be viewed through several dimensions, including the quality and diversity of menus, nutritional adequacy, food safety, targeting accuracy, consumption levels, monitoring, and evaluation.

In addition to the quantitative results, participant engagement during the activity demonstrated considerable interest in the topic. Discussions addressed practical issues related to nutritious food choices, the composition of meals, food safety, children's nutritional needs, and the role of families and communities in supporting MBG implementation. The active interaction provided an opportunity for participants to relate the information presented to their everyday experiences and household food practices. The activity also strengthened participants' understanding of the community's role in supporting the implementation of MBG. Participants were encouraged to recognize that parents, health cadres, teachers, and community members have an important role in promoting healthy dietary practices, supporting children's consumption of nutritious food, and contributing to constructive monitoring of program implementation. Thus, the activity provided not only informational benefits but also an opportunity to strengthen community awareness regarding participation in nutrition-related programs. Overall, the results show that the nutrition literacy intervention was associated with an improvement in participants' knowledge, as reflected in the increase in the mean score from 65.4 to 88.2. The 34.86% increase provides an empirical indication that the educational activity was useful in strengthening participants' understanding of nutrition and the MBG Program. However, the results should be interpreted as evidence of improvement in knowledge following the educational intervention rather than as evidence of changes in nutritional status or long-term behavioral outcomes.

#### 4. Discussion

The increase in the average knowledge score from 65.4 to 88.2, corresponding to a 22.8-point increase or 34.86% improvement, indicates that community-based nutrition education can contribute to strengthening public understanding of nutrition and the MBG Program. The finding is important because nutrition literacy involves more than recognizing nutritious foods; it also encompasses the ability to understand, evaluate, and apply nutrition-related information in everyday decision-making. Improved knowledge can therefore provide an important cognitive foundation for communities to make more informed decisions regarding food selection and consumption. The finding is consistent with previous research demonstrating the contribution of nutrition education to improvements in nutrition-related knowledge and practices. Dewi et al. (2020) reported that dietary diversity among children in Indonesia was associated with maternal education, access to information, and socioeconomic conditions. These findings suggest that access to relevant and understandable nutritional information is an important component of efforts to improve dietary practices. In the present activity, participants were provided with information that connected the concept of balanced nutrition with practical issues such as dietary diversity, nutrient adequacy, and food safety.

The observed improvement also supports the importance of integrating nutrition education with food-based interventions. Mardani et al. [2] demonstrated that nutrition education can improve knowledge, self-efficacy, and complementary feeding practices among caregivers. This evidence is particularly relevant to MBG because the provision of nutritious meals may achieve greater benefits when beneficiaries and their families possess sufficient knowledge to understand the nutritional value of the food provided and incorporate healthy dietary practices into daily life. The results are also consistent with the broader evidence concerning school feeding programs. Wang et al. [3], through a systematic review and meta-analysis, found that school feeding programs in low- and middle-income countries can contribute to improvements in selected health and educational outcomes. Similarly, Cohen et al. [4] reported that universal school meal programs were associated with increased participation in school meals and potential improvements in diet quality, food security, academic outcomes, and selected health indicators. These findings provide a useful evidence base for explaining the potential contribution of MBG to

human resource development. Nevertheless, evidence from other countries cannot automatically be interpreted as evidence of equivalent effects in Indonesia because program designs, implementation systems, food environments, and socioeconomic conditions differ.

An important aspect emerging from the activity was the participants' broader understanding of how the effectiveness of a meal program should be assessed. The effectiveness of MBG should not be reduced to the number of meals distributed to beneficiaries. Menu quality, dietary diversity, nutrient adequacy, food safety, acceptability, actual consumption, targeting accuracy, monitoring, and evaluation are also important dimensions. This perspective is supported by Gelli et al. [5], whose cluster randomized trial in Ghana demonstrated that the nutritional effects of a large-scale school feeding program varied across population groups. Such findings indicate that program effectiveness can depend on beneficiary characteristics and implementation conditions. The educational benefits associated with meal programs further reinforce the importance of a comprehensive approach. Jomaa et al. [9] found positive associations between school feeding programs and educational outcomes, including school attendance and learning. Wang et al. [3] likewise reported that school feeding can generate both nutritional and educational benefits. Therefore, the community's understanding of MBG needs to extend beyond the immediate provision of food to include its broader potential contribution to children's health, learning, and human capital development.

The Indonesian experience also provides an important basis for interpreting the findings. Mahananny et al. [11], in evaluating the School Nutrition Program (Program Gizi Anak Sekolah/ProGAS), found improvements in dietary diversity, meal frequency, handwashing practices, and nutrition knowledge. However, changes in nutritional status and certain nutrient intakes were not statistically significant. This finding illustrates that improvements in knowledge and food-related practices do not necessarily translate immediately into measurable changes in nutritional status. Consequently, the increase in knowledge observed in the present activity should be regarded as an important initial outcome rather than as evidence that the MBG Program has already produced long-term nutritional effects. From a policy perspective, the results reinforce the importance of community literacy in supporting the implementation of MBG. Presidential Regulation of the Republic of Indonesia Number 83 of 2024 provides the institutional foundation for the National Nutrition Agency (Badan Gizi Nasional/BGN) and its role in national nutrition fulfillment. Meanwhile, Presidential Regulation of the Republic of Indonesia Number 115 of 2025 establishes a governance framework for the implementation of the MBG Program. Within this policy context, community literacy becomes relevant because effective implementation requires not only government institutions and program implementers but also informed and participatory communities.

The improvement in knowledge among the 68 participants also has implications for community empowerment. Parents and community members who understand balanced nutrition and the objectives of MBG are better positioned to support healthy food practices within their households and to participate constructively in the implementation of nutrition programs. Community participation can also help bridge the gap between policy objectives and everyday nutritional practices. In this sense, nutrition literacy education functions as a complementary intervention that strengthens the social environment surrounding MBG implementation. Nevertheless, the findings have several limitations. First, the evaluation focused primarily on changes in knowledge measured immediately before and after the activity. Therefore, the findings cannot establish whether the intervention resulted in sustained behavioral changes or improvements in nutritional status. Second, the evaluation used descriptive comparison of mean scores; no inferential statistical test was conducted. Accordingly, the 34.86% increase should be interpreted as a descriptive improvement rather than a statistically significant effect. Third, the activity did not include a long-term follow-up assessment to determine whether participants applied the knowledge acquired during the activity in their daily dietary practices.

Future community service activities should therefore incorporate follow-up assessments to examine the sustainability of knowledge improvements and their translation into dietary behavior. Additional indicators, such as dietary diversity, frequency of nutritious food consumption, food safety practices, and community participation in monitoring MBG, could provide a more comprehensive assessment of outcomes. Continued collaboration among universities, local governments, health cadres, schools, families, and other stakeholders is also needed to ensure that nutrition literacy becomes a sustained community capacity rather than a one-time educational outcome. Overall, the findings demonstrate that community nutrition literacy education can serve as an important complementary strategy for supporting MBG implementation. The increase in the average knowledge score from 65.4 to 88.2 among 68 participants provides evidence of a positive learning outcome from the activity. More importantly, the intervention encouraged participants to understand MBG from a broader perspective, linking nutritious food provision with dietary quality, food safety, community participation, monitoring, and sustainable nutrition improvement. These findings support the continuation of community-based nutrition literacy programs as part of broader efforts to strengthen the implementation and accountability of the MBG Program.

## 5. Conclusion

The community service activity demonstrated that nutrition literacy education and mentoring can serve as an important complementary strategy for strengthening community understanding of the Free Nutritious Meals (MBG) Program in Bogor Regency. Involving 68 participants, the activity resulted in an increase in the average knowledge score from 65.4 before the intervention to 88.2 afterward, representing an improvement of 22.8 points or 34.86%. This improvement indicates that the educational intervention was effective in strengthening participants' understanding of balanced nutrition, dietary diversity, food safety, the objectives and implementation of MBG, and the role of the community in supporting the program. Nevertheless, the findings primarily reflect changes in knowledge and should not be interpreted as evidence of direct improvements in nutritional status or the long-term effectiveness of MBG. Continued nutrition literacy education, community mentoring, and periodic follow-up evaluations are therefore recommended to sustain knowledge improvements and encourage their translation into healthy dietary practices and meaningful community participation in supporting the implementation and accountability of the MBG Program.

## References

- [1] R. Sekartaji *et al.*, "Dietary Diversity and Associated Factors Among Children Aged 6-23 Months in Indonesia.," *J. Pediatr. Nurs.*, vol. 56, pp. 30–34, 2021, doi: 10.1016/j.pedn.2020.10.006.
- [2] R. A. D. Mardani, W.-R. Wu, Z. Hajri, Z. Thoyibah, H. Yolanda, and H.-C. Huang, "Effect of a Nutritional Education Program on Children's Undernutrition in Indonesia: A Randomized Controlled Trial.," *J. Pediatr. Heal. care Off. Publ. Natl. Assoc. Pediatr. Nurse Assoc. Pract.*, vol. 38, no. 4, pp. 552–563, 2024, doi: 10.1016/j.pedhc.2024.02.006.
- [3] D. Wang, S. Shinde, T. Young, and W. W. Fawzi, "Impacts of school feeding on educational and health outcomes of school-age children and adolescents in low- and middle-income countries: A systematic review and meta-analysis.," *J. Glob. Health*, vol. 11, p. 4051, 2021, doi: 10.7189/jogh.11.04051.
- [4] J. F. W. Cohen, A. A. Hecht, G. M. McLoughlin, L. Turner, and M. B. Schwartz, "Universal School Meals and Associations with Student Participation, Attendance, Academic Performance, Diet Quality, Food Security, and Body Mass Index: A Systematic Review.," *Nutrients*, vol. 13, no. 3, Mar. 2021, doi: 10.3390/nu13030911.
- [5] A. Gelli *et al.*, "A School Meals Program Implemented at Scale in Ghana Increases Height-for-Age during Midchildhood in Girls and in Children from Poor Households: A Cluster Randomized Trial.," *J. Nutr.*, vol. 149, no. 8, pp. 1434–1442, Aug. 2019, doi: 10.1093/jn/nxz079.
- [6] S. Adelman, D. O. Gilligan, J. Konde-Lule, and H. Alderman, "School Feeding Reduces Anemia Prevalence in Adolescent Girls and Other Vulnerable Household Members in a Cluster Randomized Controlled Trial in Uganda.," *J. Nutr.*, vol. 149, no. 4, pp. 659–666, Apr. 2019, doi: 10.1093/jn/nxy305.
- [7] S. E. Whaley *et al.*, "The impact of dietary intervention on the cognitive development of Kenyan school children.," *J. Nutr.*, vol. 133, no. 11 Suppl 2, pp. 3965S–3971S, Nov. 2003, doi: 10.1093/jn/133.11.3965S.
- [8] C. G. Neumann, S. P. Murphy, C. Gewa, M. Grillenberger, and N. O. Bwibo, "Meat supplementation improves growth, cognitive, and behavioral outcomes in Kenyan children.," *J. Nutr.*, vol. 137, no. 4, pp. 1119–1123, Apr. 2007, doi: 10.1093/jn/137.4.1119.
- [9] L. H. Jomaa, E. McDonnell, and C. Probart, "School feeding programs in developing countries: impacts on children's health and educational outcomes.," *Nutr. Rev.*, vol. 69, no. 2, pp. 83–98, Feb. 2011, doi: 10.1111/j.1753-4887.2010.00369.x.
- [10] M. K. Spill *et al.*, "Universal Free School Meals and School and Student Outcomes: A Systematic Review.," *JAMA Netw. open*, vol. 7, no. 8, p. e2424082, Aug. 2024, doi: 10.1001/jamanetworkopen.2024.24082.
- [11] I. L. Pramesthi *et al.*, "Evaluating the Impact of Indonesia's National School Feeding Program (ProGAS) on Children's Nutrition and Learning Environment: A Mixed-Methods Approach.," *Nutrients*, vol. 17, no. 22, Nov. 2025, doi: 10.3390/nu17223575.
- [12] P. E. Lukitasari, H. Hariyono, and N. Mahananny, "Analisis Kerjasama Lintas Sektor dalam Program Pemberian Makanan Tambahan Lokal pada Balita Gizi Kurang di Puskesmas.," *Nutr. J. Pangan, Gizi, Kesehat.*, vol. 7, no. 1 SE-Articles, pp. 48–56, doi: 10.30812/nutriology.v7i1.5804.
- [13] A. Fachrullah, "Implementation of the Free Nutritious Meal Program: Evaluation of Implementation and Operational Challenges," *Sci. J. Has. Penelit.*, vol. 11, no. 1 SE-Articles, 2026, doi: 10.32923/g2g5hb02.
- [14] M. F. Akbar, "Implementation of the Free Nutritious Meal Program in Indonesia: A Systematic Review of Governance, Institutional Capacity, and Implementation Gaps," *Int. J. Pap. Public Rev.*, vol. 7, no. 1 SE-, pp. 46–60, Jul. 2026, doi: 10.47667/ijppr.v7i2.484.
- [15] F. A. Suprpto, E. Praditya, R. M. Dewi, and W. Adiyoso, "A Policy Implementation Review of the Free Nutritious Meal (MBG) Program," *J. Indones. Sustain. Dev. Plan.*, vol. 6, no. 2 SE-Policy Paper, pp. 297–312, Aug. 2025, doi: 10.46456/jisdep.v6i2.798.