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Research Article

Effectiveness of Community-Based Nutrition Interventions in Preventing Stunting and Malnutrition in Toddlers: A Literature Review

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Abstract: Stunting and undernutrition remain serious public health issues among under-five children, particularly in developing countries. Community-based nutrition interventions are considered effective in integrating both specific and sensitive approaches to address these challenges. This study aims to review the effectiveness of various community-based nutrition interventions in preventing stunting and undernutrition among under-five children. A narrative review approach was employed to analyze six peer-reviewed articles published in the last five years (2021–2025), selected from PubMed, ScienceDirect, and Google Scholar using relevant keywords and inclusion criteria. The findings demonstrate that community-based nutrition interventions positively impact stunting reduction and improve child nutritional status. The most effective interventions included family-based nutrition education, growth monitoring, supplementary feeding, lipid-based nutrient supplementation, and innovative programs such as child-owned poultry. Active community participation, engagement of health cadres, and multi-sectoral collaboration were critical to the success of the programs. Community-based nutrition interventions are effective strategies to improve child nutrition and prevent stunting, particularly when implemented participatively and sustainably. These findings provide a basis for community nursing practices and the formulation of contextually appropriate and impactful nutrition policies.

Keywords: community-based nutrition intervention, stunting, undernutrition

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1. Introduction

Currently, stunting is still a public health problem both globally and nationally. Based on a global conference held by member countries of the United Nations (UN) in 2016, an agenda was born which was summarized into the Sustainable Development Goals (SDGs) which aims to overcome 17 global problems, some of which are to end poverty, hunger, and improve the health and welfare of people around the world[1].

Stunting is closely related to the global agenda of SDGs, especially the second target, which is to end all forms of hunger and malnutrition. Specifically, reducing the prevalence of stunting is part of the official SDGs indicators, namely indicator 2.2.1; prevalence of stunting (children under 5 years of age with height for age below WHO standards[1]. From this indicator it is clear that this standard is used globally to assess the growth status of children and to mark the presence of chronic growth and development disorders that last in the long term.

Based on data from the 2022 Indonesian Nutritional Status Survey (SSGI), the prevalence of stunting in toddlers in Indonesia is still quite high, reaching 21.6%.[2]. This figure is still quite high compared to the national target of 14% to be achieved in 2024 in accordance with the provisions in the National Medium-Term Development Plan (RPJMN)

2020-2024.[3]. To achieve this target, Indonesia needs to reduce the prevalence of stunting by an average of 3.8% per year to achieve the target that has been set. This is inseparable from various factors, conditions and interventions carried out by the government and public awareness so that they can synergize towards reducing stunting and malnutrition.

Stunting is a condition of growth failure in children due to chronic malnutrition and repeated infections, especially in the first 1000 days of life, which lasts from pregnancy to the age of two. This condition not only affects the child's physical growth, but can also reduce cognitive abilities, increase the risk of chronic diseases in adulthood, and can reduce economic and social productivity in the future. Stunting is a multidimensional condition influenced by various factors, such as low nutritional intake, poor sanitation, lack of access to health services, and inadequate parenting practices. Therefore, the approach used in preventing stunting needs to involve a comprehensive and cross-sectoral strategy.[4].

Malnutrition reflects a condition of chronic lack of energy or macro and micro nutrient intake which is directly linked to increased risk of stunting and linear growth disorders in children. Based on a recent systematic review, factors that influence and are found to be the main determinants of malnutrition are such as low maternal nutritional status, lack of access to sanitation, low access to clean water, and poor parenting practices, especially in feeding children under the age of one year, especially in developing countries.[5]. These findings are in line with UNICEF's guidelines on the conceptual framework for malnutrition, which distinguishes between basic, intermediate and immediate determinants, where malnutrition (such as wasting and underweight) can develop into stunting if not addressed promptly and comprehensively.[6].

Currently, the Indonesian government has developed various intervention programs that include specific nutrition and sensitive nutrition approaches. The specific nutrition approach focuses on direct interventions against the main causes of stunting such as fulfilling macro and micro nutrient needs for pregnant and lactating mothers, and toddlers through the provision of iron and vitamin A supplements, additional food, and the promotion of exclusive breastfeeding and appropriate complementary feeding.[7]. Meanwhile, the sensitive nutrition approach is directed at indirect interventions that support improvements in social and environmental determinants of nutrition, such as increasing access to clean water and sanitation, providing basic health services, nutrition education for families, and social protection for underprivileged communities.[8]. Both of these approaches have been sufficient, but the main challenges that are still faced are the affordability of the program and the sustainability of the intervention, especially in rural and remote areas. One approach that is considered effective in responding to these challenges is community-based nutrition intervention. This approach involves active participation from the community, including health cadres, community leaders and families in supporting activities to provide nutritious food needs, provide education, and monitor child growth.

In community nursing practice, nurses not only act as educators and facilitators, but also as empowerment agents who encourage the community to be more independent in maintaining the health of their families, especially children. Community nurses are important to understand the various forms and effectiveness of community-based nutrition interventions as a basis for developing more contextual and evidence-based community nursing strategies. In a study conducted in Indonesia on 80 mothers of toddlers by conducting a four-week nutrition education program, it has been shown to significantly increase knowledge, self-efficacy, and practice of providing complementary feeding, thereby reducing the risk of stunting and malnutrition for up to 24 weeks after the intervention.[9]. This shows that interventions related to family nutrition play an important role in family health, so there needs to be health awareness in every family to improve the health status of the family, especially children.

Although various intervention programs have been developed related to stunting prevention, until now there have been few literature studies that specifically examine the role of community-based nutritional interventions in the context of stunting prevention in toddlers, especially in developing countries such as Indonesia. In fact, interventions that involve direct active community participation have great potential in increasing program effectiveness and the sustainability of the program itself.[10]. Therefore, this article aims to review and analyze various community-based nutrition interventions that have been reported in the scientific literature in the last ten years, and to examine their effectiveness in reducing the prevalence of stunting in toddlers. The results of this study are expected to be a scientific

reference in the planning and implementation of community-based nutrition intervention programs for the prevention of stunting in toddlers in Indonesia that are more effective and sustainable.

2. Literature Review

Research related to community-based nutrition interventions can be one of the efforts to prevent stunting and malnutrition in toddlers. Beatty et al (2023) assessed the effectiveness of a comprehensive community-based intervention package in reducing stunting in Indonesia. The intervention package consisted of community-based development grant funds for health and education services, training of health workers on feeding and monitoring infant and child growth, and community-based sanitation training. However, the results of the study showed that the community-based intervention package had no significant impact on stunting (0.5 pp; 95% confidence interval [CI]: -3.0 to 4.1 percentage points [pp]) and there was also no significant change in sanitation. although there were changes in maternal and child nutrition practices, such as increased consumption of iron-folic acid tablets in pregnant women according to recommendations, increased exclusive breastfeeding in infants aged 0-5 months, and increased meal frequency in children aged 6-23 months according to recommendations [11].

Another community-based nutrition intervention in the form of education to reduce stunting was carried out by Rochmah et al (2024) showing an increase in parental knowledge regarding stunting prevention, although there was an increase in understanding about nutrition, immunization, the importance of growth monitoring, but there were still gaps in the field of exclusive breastfeeding and the long-term effects of stunting. In addition, the intervention given was short in duration so that it could not see any changes in child growth[12].

Increased appetite in stunted children who received community-based nutritional interventions in Bangladesh conducted by Naila et al (2021) showed that during the provision of nutritional intervention by consuming eggs and milk, children's appetite scores increased from 49 to 60. Small sample size, difficulty recruiting participants and no control group are weaknesses in the study[13]. Yao and Jian (2021) stated that the Chinese government program, Ying Yang Bao (an iron-rich supplement made from soybean powder) can reduce the prevalence of stunting from 26.3% to 10.8%, underweight from 13.4% to 8.7%, wasting from 14% to 10.5% and anemia from 52.1% to 43.9% [14].

Several other studies only assess predictors or factors, the prevalence of stunting and malnutrition, including research conducted by Li et al (2022) in children under 6 years of age showing a prevalence of stunting of 4.4% (241), malnutrition 3.9% (217), thinness 4.0% (221), risk factors for malnutrition are higher in children with low birth weight, maternal weight gain, ethnicity of caregivers, large family size during pregnancy[15] and other research by Ngassa (2022) showing the main predictors of malnutrition in children aged 6-59 months are drinking water from inappropriate sources, food diversity and gender of the child[16].

Good nutrition during pregnancy and the first year of a child's life is essential for brain growth, body growth, and a strong immune system. Many studies have shown that the 1000 HPK period determines a person's health throughout their life, including the possibility of suffering from obesity and other chronic diseases. Diabetes, cardiovascular and brain blood vessel disease are examples of such chronic diseases. Therefore, obtaining balanced nutrition and proper nutrition from pregnancy until the child is less than 2 years old is very important[17]. The importance of balanced nutrition during the 1000 HPK period requires appropriate nutritional interventions and requires community involvement in implementing and monitoring the program on an ongoing basis to increase the effectiveness of the program.

3. Method

This article is a literature review compiled using a narrative review approach that aims to identify and analyze empirical evidence related to community-based nutritional interventions in preventing stunting in toddlers under five years of age sourced from international journal articles. The literature search was carried out with the following steps:

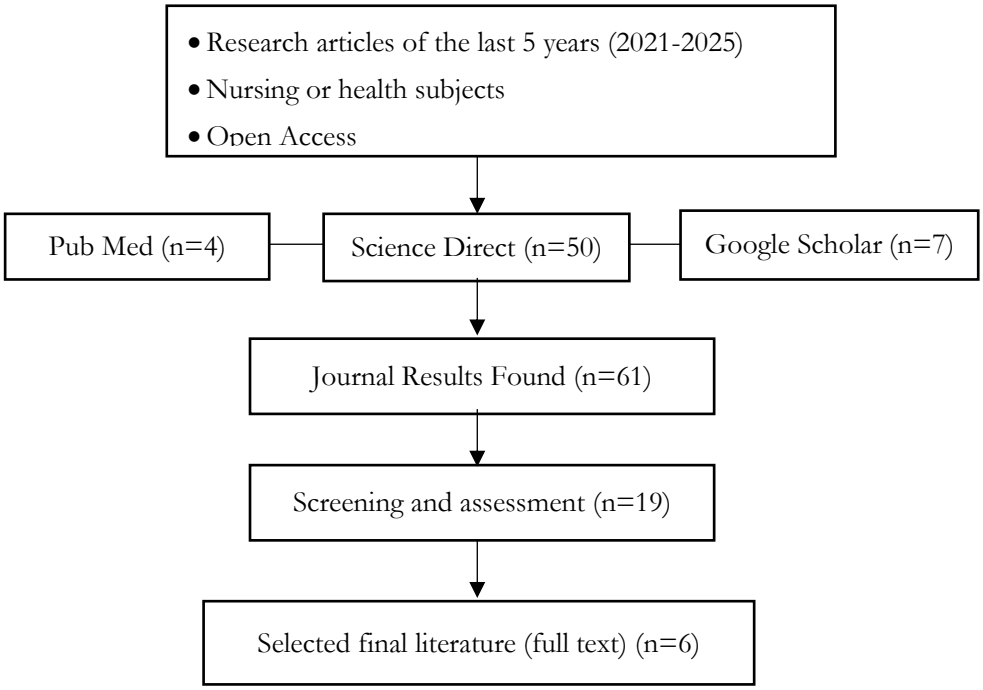

Figure 1. Literature search process

Based on the results of journal searches on Google Scholar, Pub Med, and Science Direct using the keywords 'community-based nutrition intervention', 'stunting', 'under-five children' or 'community-based nutrition intervention', 'stunting' and 'toddlers', using a research article filter within the last 5 years (2021-2025), and the type of open access article, the researcher obtained 61 articles. Furthermore, the researcher conducted screening and assessment of the abstract to determine the criteria that were in accordance with the topic using the PICO method, namely based on the population in the study, the intervention whose effectiveness was to be studied, comparison or comparator (if any), and the results measured (outcome). From this stage, the researcher obtained 19 articles. After carrying out this stage, the author further examined the articles by determining the inclusion criteria according to the expected topic, namely the implementation of community-based nutrition interventions through both specific nutrition and sensitive nutrition which have been proven effective in preventing stunting in children under 5 years of age (toddlers). From the in-depth search, the author obtained 6 articles of literature, this is because only a few articles discuss specific nutritional interventions given to toddlers to prevent stunting. In general, the research conducted only looks at the correlation between nutritional factors and the prevalence of stunting, but no specific interventions related to nutrition are carried out. In several other articles, interventions related to nutrition were found but did not focus on the problem of stunting in toddlers. Therefore, the following are research articles obtained by the author after conducting an in-depth search related to nutritional interventions to prevent stunting in toddlers.

4. Results and Discussion

4.1 Results

Table 1 Community-Based Nutrition Intervention in Preventing Stunting and Malnutrition

Research Title	Researcher Name	Research purposes	Popul -ation	Research methods	Interventions Used	Research result
Process Evaluation of Community -Based	Teshome D. Nimani et al.	Evaluating the implement ation of a communit	Childr en under 2	Facility-based case study with a qualitative approach	Growth monitoring, nutrition promotion (GMP) for	The achievement of program implementati on is

Nutrition Services for Under 2 Years Children in Degadamot District Using Qualitative Approach, Western Ethiopia		y-based nutrition (CBN) service program in Ethiopia	years of age		children under 2 years. Nutrition education for mothers, including breastfeeding practices and complementary feeding.	62.68%; however, training and improvement of health worker compliance and availability of resources are still needed.
Effect of Nutritional Education on Anthropometric Deficits among Preschool Aged Children in Southwest Ethiopia: Quasi Experimental Study	Kebebe Bidira et al.	Evaluating the effects of nutrition education on the nutritional status of preschool children.	Preschool children (2-5 years) in Ilu Abba Bor zone, Ethiopiaa	Quasi-experimental with control group and pre-post-test	Nutrition education is carried out for 9 months with modules that include awareness of healthy diets, nutrition, and clean living behavior.	Effective interventions significantly reduce malnutrition rates in preschool children.
Treatment Outcome of Severe Acute Malnutrition Among Children (6-59 Months) in Outpatient Therapeutic Feeding Program in Gursum District, Somali region, Ethiopia	Abdulahi Bedel Budul et al.	To assess the treatment outcomes of severe acute malnutrition (SAM) and factors associated with treatment outcomes in children treated in the outpatient therapeutic program (OTP) in Gursum.	Children aged 6–59 months who are treated in the Gursum OTP program	Facility-based retrospective study	Outpatient Nutrition Therapy Program (OTP) that uses ready-to-use therapeutic foods (RUTF) and routine medications such as antibiotics, vitamin A, and vaccinations	The results of the study showed a relatively high recovery rate of SAM, there is a need to increase the average body gain and reduce the length of stay in OTP.
Protocol for Integrated Solutions for Healthy birth, growth and	Shan Huang et al.	Assessing the effectiveness of an integrated nutrition interventio	Children aged 6, 12, and 18	The research design used a cluster controlled experiment.	Primary health care services with a nutrition intervention package that includes	Nutrition intervention packages showed a reduction in the prevalence

development: a Cluster-Randomised Controlled Trial to Evaluate The Effectiveness of a Mixed Nutrition Intervention Package in Reducing Child Undernutrition in Lao People's Democratic Republic		n package, including specific and sensitive nutrition interventions in reducing malnutrition in children.	months		nutrition education, breastfeeding promotion, and childhood disease management.	of stunting in toddlers.
Egg Consumption of Children Under Two Years of Age Through a Child-Owned Poultry and Nutrition Intervention in Rural Ethiopia: A Community-Based Randomized Controlled Trial	Anteneh Omer et al.	Testing the effects of providing children with their own chickens and nutritional education on egg consumption.	Children aged 6–18 months in Halaba, Ethiopia	Randomized controlled trial	Provision of local laying hens and family nutrition education	Significant increase in egg consumption and diversity of children's diets.
Effect of Lipid-based Nutrient Supplement on Micronutrient Status and Hemoglobin Among Children with Stunting: Secondary Analysis of A Randomized Controlled	Rolland Mutumba et al.	Assessing the effects of lipid-based supplements (LNS) containing milk protein on micronutrient and hemoglobin status in children with stunting.	Children aged 12-59 months with stunting	Randomized controlled trial (RCT)	Administration of 100 grams of LNS containing milk protein per day for 12 weeks	LNS administration has been shown to be effective in improving micronutrient and hemoglobin status in children with stunting.

Trial in Uganda						

Based on the results of the review of the six articles, it was found that community-based nutrition interventions have a positive impact on reducing the prevalence of stunting, increasing the consumption of nutritious foods, and increasing parental knowledge in child care and feeding practices. The most effective interventions include specific nutrition programs, nutritional education approaches, and routine monitoring of child growth. Specific nutrition interventions such as the use of LNS supplements and the provision of high-protein foods such as eggs showed significant results in preventing stunting and improving malnutrition in children under five years of age.[18].

One of the important findings from these articles is that community-based nutrition education has a significant impact on improving knowledge and practices of feeding toddlers, thus resulting in improved nutritional status. For example, a study conducted byBidira et al. (2022)in Ethiopia showed that a structured and sustainable nutrition education program can significantly reduce malnutrition in preschool children. In addition, other studies have shown that providing specific nutrition therapy in outpatient therapy for children with severe malnutrition has shown significant improvements.[20]. This intervention will be more effective if it is carried out together with the provision of nutritional education to mothers with toddlers, it can improve the mother's understanding of child care and feeding, thus providing a positive impact on child growth and development.

In addition to nutrition education, material interventions or direct support have also shown promising results, such as complementary or additional food programs, provision of health supplements, availability of primary health care facilities, and encouragement from professional health workers. A combination of several more innovative interventions such as those carried out byOmer et al. (2022)namely the provision of laying hens owned by children while providing nutritional education to their families has been proven to increase egg consumption in children so that they meet their protein requirements. This model not only improves nutritional status but also empowers families through a microeconomic approach based on household assets.

Furthermore, the results of the studies in these articles emphasize the importance of an integrative approach between specific and sensitive nutrition interventions and active community involvement in every stage of program implementation. The process evaluation study conducted byDemis Nimani et al. (2024)shows that the community nutrition service program in Ethiopia is running quite well but still faces challenges in terms of consistency of implementation, availability of training for cadres and logistical support. Therefore, the success of this intervention cannot stand alone and is highly dependent on cross-sector coordination and ongoing cadre development. Overall, the six articles show that community-based nutrition interventions that are designed in a participatory manner, supported by local capacity, and implemented consistently can be an effective strategy to reduce the prevalence of stunting and malnutrition in children.

4.2 Discussion

Stunting and malnutrition in toddlers are serious public health problems that occur in many developing countries, including Indonesia. According to data from UNICEF, around 22% of children under the age of five experience stunting which has a negative impact on their physical growth and cognitive development.[23]. Community-based nutrition interventions are one of the effective strategies to address this issue. The articles reviewed in this literature provide important insights into the role of specific and sensitive nutrition interventions that can be implemented in a community context to prevent stunting and malnutrition.

Specific nutrition interventions focus on providing nutritious food and supplements to improve nutritional status in children. From the results of the article study, it was found that community-based specific nutrition interventions provide real results in efforts to reduce the prevalence of stunting and malnutrition, as shown in a study by Omer et al. where providing laying hens to children to be raised accompanied by nutrition education involving families succeeded in increasing egg consumption and eating behavior with balanced nutrition in children. This study successfully showed that providing affordable animal protein sources such as eggs can increase children's nutritional intake and reduce the risk of stunting and malnutrition. Similar interventions were also carried out in Ethiopia with a family and

community-based education approach to improve anthropometric status in toddlers in Ethiopia[24].

On the other hand, sensitive nutrition interventions involve a more holistic approach, including nutrition education, increasing access to nutritious foods, and behavioral change.Bidira et al. (2022)shows that nutrition education provided to parents can reduce the prevalence of stunting and malnutrition in preschool children. This intervention can not only increase parents' knowledge about the importance of balanced nutrition, but also encourage them to implement better feeding practices for their families, especially their children. This approach aims to address the root causes of stunting and malnutrition by involving all parties in efforts to improve children's nutritional status. Families and communities have a very important role in the success of this intervention. The family as the smallest unit in society has the responsibility to apply the knowledge gained from balanced nutrition education into daily practices, such as preparing food with a varied menu, processing food while maintaining cleanliness and nutritional content, to regulating good eating patterns for the family, especially children. In addition, support from other family members such as grandparents, or other relatives can also strengthen good habits in feeding and maintaining children's health.

The role of family and community is very synergistic in helping the success of specific and sensitive nutrition interventions in children. As with the Community-Based Nutrition (CBN) program implemented in Ethiopia, it shows that the success of the intervention is very dependent on the role of health cadres (Health Extension Workers/HEWs), the availability of logistics, routine training, and cross-sector support.[22]. The program approaches using the concept of "Triple A" namely Assessment, Analysis, Action which reflects the framework of community nursing in identifying public health problems in a participatory manner. This approach not only involves data collection and problem analysis, but also encourages collective action to address nutritional problems in the community.

By involving families and communities, nutrition interventions become more relevant and sustainable. This is in line with community nursing theory which emphasizes the importance of collaboration between nurses, families, and communities in creating a health-supportive environment. Community nursing theory focuses on a holistic approach to caring for individuals and groups in the community. In this context, community nurses play an important role in identifying nutrition problems in the community, providing nutrition education, and facilitating access to nutrition resources. According to[25], community nurses must be able to collaborate with various stakeholders including government, non-governmental organizations, and communities to create effective intervention programs.

The results of the study in several articles show a strong relationship between the interventions carried out with several community nursing theories. Some relevant theories are the Health Promotion Model (HPM), Social Cognitive Theory (SCT), and Community as Partner Theory (CAP). In the HPM theory, there is relevance to the increase in maternal self-efficacy in the practice of feeding and the use of integrated health service posts to overcome nutritional problems in children. The self-efficacy possessed by mothers will direct behavior to seek help in improving health behavior, with the support of adequate primary health services, this can have a positive impact on improving nutritional status in toddlers as seen in the study byHuang et al. (2023). While SCT emphasizes the importance of interaction between individuals, behavior, and the environment. In this context, nutritional education provided to parents can increase their knowledge about the importance of balanced nutrition which can ultimately influence feeding behavior in children such as a study conducted by[19]. The results of the study show that providing balanced nutrition education has proven effective in changing parental behavior in providing nutritious food to their children, thereby reducing the prevalence of stunting and malnutrition.

In the theory of community nursing that uses the community as a partner (CAP) approach, it emphasizes the importance of a community-based approach in increasing public awareness for healthy living. This theory recognizes that individual health is influenced by various factors, including the social, economic, and cultural environment. In addition, this theory also emphasizes the importance of collaboration between parties in society, so that an intervention cannot run optimally if there is no support and participation from a community. With a sense of shared responsibility in resolving a problem, it is likely that the intervention will be successful because all parties will strive for the program to run according to the expected goals. This can be seen from the results of several studies involving various parties in society such as those conducted byDemis Nimani et al. (2024).

To mobilize community participation in the sustainability of an intervention, of course there must be a guide who can provide encouragement and be a role model for the activity. This is

where the importance of community nurses lies. In the context of nutritional interventions, community nurses play an important role in analyzing problems, providing health education related to problems, and being a bridge between vulnerable individuals or groups and health service providers.[27].

Community nurses are not only responsible for providing information, but also empowering families and communities to implement the behavioral changes needed to improve child nutrition. Trained community nurses can effectively identify nutritional problems in the community and design interventions that are appropriate to local needs, thereby increasing the success of nutrition programs.[28].

Ultimately, the success of community-based nutrition interventions is a complete package between providing balanced nutrition, in this case specific and sensitive nutrition, with active community involvement in various sectors. Because this intervention takes a long time in the process and the results cannot be seen immediately, there needs to be consistency and sustainability of the program that must be attempted by all parties, especially the community directly related to the families receiving the intervention. In addition, there needs to be a monitoring and evaluation process for the interventions carried out, because through this process it will provide a quick response to the improvements and changes expected in the future. Monitoring carried out by community nurses together with the community can help detect emerging nutritional problems and provide the necessary support to prevent the development of more serious problems in the future. Thus, community nurses not only function as health service providers, but also as agents of change who contribute to improving the health and well-being of children in the community, of course with direct community involvement that can improve the general nutritional status of the wider community.

5. Conclusions

Community-based nutrition interventions are an effective strategy to prevent stunting and malnutrition in toddlers with an approach that integrates specific and sensitive nutrition interventions. Specific nutrition interventions focus on providing nutritious food and supplements, while sensitive nutrition interventions include approaches by providing nutrition education, increasing access to nutritious food, and sustainable behavior change. Through these programs, community nurses act as a liaison between the community and health services and provide nutrition education and health promotion needed to increase knowledge and adaptive behavior change towards balanced nutrition. To increase the success of the intervention, it is recommended that these programs also involve various parties in cross-sector collaboration and ensure that the programs implemented are relevant and acceptable to the community. Building strong partnerships and sustainable support will greatly assist in achieving optimal public health goals. Therefore, joint efforts in community-based nutrition interventions are very important to reduce stunting and malnutrition in toddlers and improve the quality of life of children and community welfare.

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Conflicts of Interest: None declared

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