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A Literature Review of Community-Based Interventions for Stunting Reduction in Children under Five

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ABSTRACT

Stunting is a significant chronic nutritional problem in Indonesia and the world, caused by long-term malnutrition, especially in the first 1000 days of life. Community-based interventions effectively reduce stunting rates by involving the community in health promotion, providing nutritious food, environmental sanitation, and education for pregnant and lactating mothers. This narrative literature review aims to assess the effectiveness of community-based interventions in reducing stunting among children under five years old. A structured literature search was conducted using three electronic databases: PubMed, ProQuest, and Emerald Insight. The search strategy applied Boolean operators and was framed as follows: community-based intervention AND stunted. Filters included publication years 2020–2025, articles available in full text, written in English or Indonesian, and focused on children under five. The initial search yielded 628 articles. After removing 15 duplicates and excluding irrelevant studies based on population, topic, or article type, 12 articles were selected for final analysis. The results show from 12 articles, there are six articles discussed about nutrition education, three articles about supplementary food and three articles about water and sanitation hygiene. The findings show that community-based interventions, led to stunting reduction rates ranging from 15% to 25% in developing countries. This research can serve as a reference for stunting intervention policies through nutrition education, WASH (water sanitation and hygiene), and supplementary food.

Keywords
Children under five
Community-based
Stunting

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Introduction

Stunting is a significant chronic nutritional problem in Indonesia and the world, caused by long-term malnutrition during the first 1000 days of life. Stunting is a common condition that occurs in children. The threat of stunting the quality of human resources is increasingly concerning. Stunting reflects a failure to obtain adequate nutrition over a long period and can be influenced by recurrent and chronic diseases. This condition affects children's physical growth, cognitive development, future economic productivity, and the risk of chronic diseases in adulthood [1].

Based on WHO data in 2022, the prevalence of stunting in children under 5 years of age was 22.3 %. The Indonesian Ministry of Health announced the results of the Indonesian nutrition survey, where the prevalence of stunting in Indonesia decreased from 22.4% in 2021 to 21.6% in 2022. Although there was a decrease from the previous year, great efforts are still needed to achieve the target of reducing stunting. Stunting can occur before birth; this can be seen from the prevalence of stunting based on age groups from the 2022 SSGI results, where 18.5% of babies were born with a body length of less than 48 cm. A fairly concerning result from the same survey is that the risk of stunting increases 1.6 times from 6-11 months to 12-23 months (13.7% to 22.4%).

Stunting is one of the Sustainable Development Goals (SDGs) in Sustainable Development 2: eliminating hunger and all forms of malnutrition by 2030. Stunting is also one of the government's priority programs, reducing stunting rates by 40% by 2025. Along with the development of science, preventing stunting in children under five requires a multi-generational perspective, multi-sectoral actions, and a shift in emphasis on early life and environmental conditions [2].

Stunting management is not limited to hospitals but can also be effectively carried out at the community level. Community-based approaches are essential because they enable the direct involvement of local residents, health cadres, and families in both the prevention and management of stunting. Several community-level interventions have been shown to be effective, including health education, home visits, cadre training, and supplementary feeding. Community-based and continuous health education has been proven to reduce the prevalence of stunting among children under five from 23% to 14%. These findings highlight the important role of health education in the early prevention of stunting [3]. Other studies have also reported that home visit

interventions, when supported by nutrition education, growth monitoring, and supplementary feeding, show the potential to reduce stunting by up to 27% [4]. Research on cadre training has shown that it can enhance the capacity of community health workers to deliver effective nutrition education to mothers, thereby supporting proper and effective feeding practices as a contributing factor in reducing stunting rates [5].

Based on the background above, this literature review aims to determine community-based interventions for reducing toddler stunting rates [6].

Methods

This study uses a literature review design to analyze community-based interventions to reduce toddler stunting rates. A literature review allows researchers to integrate previous research results to understand the topic being studied comprehensively. The data sources in this study come from scientific articles published in national and international journals with a publication period of the last five years (2020 - 2025). Articles were obtained through electronic databases such as PubMed, ProQuest, and Emerald.

The inclusion criteria in this literature review were determined to ensure the selection of relevant and high-quality studies. Studies were included if they reported empirical research, defined as original investigations that utilized either quantitative or qualitative methodologies to collect and analyze primary data—such as experimental, quasi-experimental, cohort, or cross-sectional designs. Articles also had to focus specifically on community-based interventions aimed at reducing stunting, with the primary population being children under five years of age (0–59 months). Only studies published between 2020 and 2025, written in English or Indonesian, and available in full-text format were considered eligible.

On the other hand, articles were excluded if they were not original research, including literature reviews, opinion papers, editorials, or policy reports that did not present original data. Studies were also excluded if their primary focus was not related to stunting outcomes in children under five, for instance, those targeting school-aged children, adolescents, or general nutrition without explicit reference to stunting. Additionally, studies were omitted if they presented incomplete data, lacked outcome indicators relevant to stunting, or were not peer-reviewed.

The researcher started the article search using the keywords community-based intervention AND stunted. The articles found were identified to remove duplication. Next, relevant articles are selected based on the title and abstract. Articles meeting the inclusion criteria were read in full to ensure relevance to the study. The initial search results found 628 articles. After the filtering process, 12 articles were selected for further analysis.

Data were analyzed narratively by identifying key findings from each article. The analysis focused on the type of intervention, implementation method, results achieved, and challenges in implementing community-based interventions to reduce stunting rates.

This study used secondary data, so it did not involve human subjects. Researchers remain compliant with ethical principles by ensuring all sources of information are correctly cited to respect intellectual property rights. Figure 1 describe the identification of studies with PRISMA diagram.

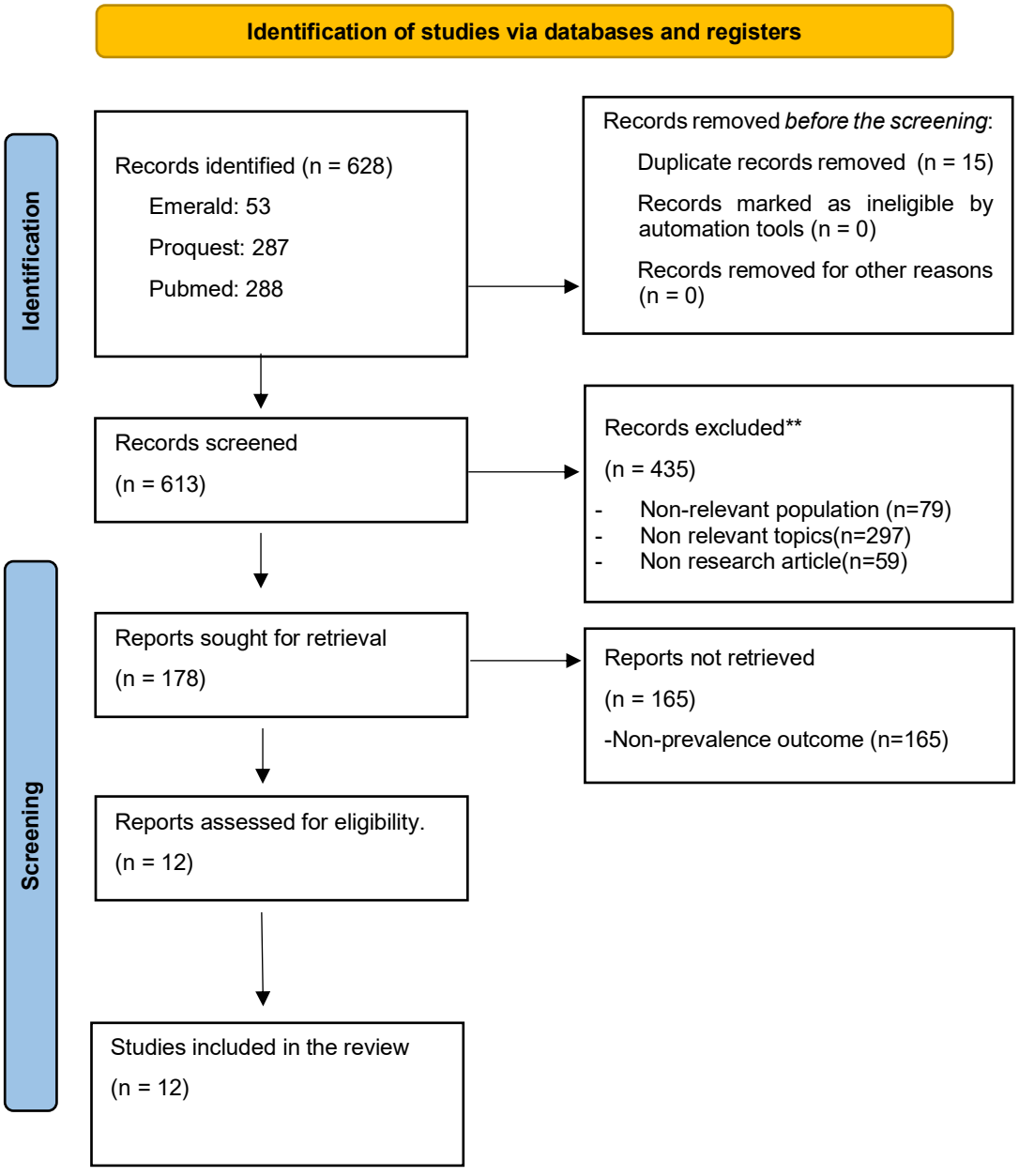


Figure 1: PRISMA Flow Diagram

Table 2. Gathered Studies.

Authors, Country	Title	Characteristics	Intervention	Results	Study Design	Risk of Bias / Limitation
[7] Sutinbuk et al (2024) Indonesia, Bangka Belitung	Effectiveness of ERKADUTA model to increase stunting prevention behaviors among mothers with toddlers in Indonesia:	Children under 5 years of age	Implementing the Erkaduta model by respondents receiving regular education about the importance of balanced nutrition and the importance of monitoring toddler health	The results showed significant changes in improving stunting prevention behavior. This study suggests that the ERKADUTA model can be an effective strategy for reducing stunting rates.	Quasi-experimental, pre-post design with non-randomized groups	Medium risk: no randomization, potential confounders, short follow-up, self-report measures
[8] Ademas et al (2021) Ethiopia	Water, sanitation, and hygiene as a priority intervention for stunting in under-five children in northwest Ethiopia: community-based cross-sectional study	children under 5 years old.	The implementation was the construction of toilets and hand washing facilities, training and awareness campaigns on the importance of hygiene, training on nutrition for pregnant and breastfeeding mothers, and conducting routine health checks on children.	The study showed that water, sanitation, and hygiene interventions significantly prevented stunting in five-year-old children.	Cross-sectional, community-based survey	High risk: cannot establish causality risk of recall and confounding bias, limited policy inference
[9] Zewdie, et al (2021) Southwest Ethiopia	Stunting and its associated factors in children aged 6–59 months in Illubabor zone, Southwest Ethiopia	Children aged 6 – 59 months	Evaluating various stunting factors, such as nutrition, sanitation, access to health services, and parental education.	About 33.7% of children aged 6–59 months included in this study were stunted. The proportion of moderate and severe stunting among the stunted children was 26.4% and 7.3%, respectively. Large family size (AOR = 4.0; 95% confidence interval [CI]: 2.5, 6.4), low dietary diversity score (AOR = 7.8; 95% CI: 4.6, 13.0), and household food insecurity (AOR = 16.4; 95% CI: 10.0, 26.7) were independent predictors of stunting.	Community-based cross-sectional	**High risk**: temporal ambiguity; recall and confounding bias
[10] Abera et al (2019) Ethiopia	Nutrition-specific and sensitive drivers of poor child nutrition in Kilt Selaelo and Demographic Surveillance Site, Tigray,	Children under 5 years old	Practicing exclusive breastfeeding, distributing nutritious food, and supplementing Vit A and iron for children.	Nutrition-specific interventions, such as micronutrient supplementation and promotion of exclusive breastfeeding, have significantly improved child growth.	Cross-sectional using HDSS data	Medium to high risk: no causal inference, confounding variables, setting-limited generalizability

Authors, Country	Title	Characteristics	Intervention	Results	Study Design	Risk of Bias / Limitation
	Northern Ethiopia: implications for public health nutrition in resource-poor settings					
[11] Andersen et al (2024) India	Maternal and child nutrition services associated with nutritional knowledge and practices, India	Children aged 0 – 5 years, pregnant women	The implementation included training and education for pregnant and breastfeeding mothers, promotion of exclusive breastfeeding, and additional food provision.	Among 110 regression models testing unique pairs of seven activities and 18 nutrition messages, 103 showed a statistically significant positive relationship (median risk ratio, RR: 1.14). For activities and nine nutrition practices, 39 out of 54 tested pairs were significantly associated (median RR: 1.16). We observed statistically significant mediation through nutrition messages for 28 out of 42 tested pairs of activities and nutrition practices	Cross-sectional survey	Medium risk: self-report data, no causality, potential confounders
[12] Atamou et al (2023) NTT, Indonesia	Analysis of the Determinants of Stunting among Children Aged below Five Years in Stunting Locus Villages in Indonesia	Children aged 24-59 months	Monitoring toddler growth to detect and address nutritional problems early, encouraging mothers to provide exclusive breastfeeding for the first 6 months of the baby's life.	This study found that the chance of stunting occurring was 20% lower in locus villages compared to non-locus villages.	Cross-sectional	High: no causality, confounding, self-report bias, limited generalizability
[13] Mistry el al (2019) Bangladesh	Maternal nutrition counseling is associated with reduced stunting prevalence and improved feeding practices in early childhood: a post-program comparison study.	Children under 5 years of age.	Providing counseling to pregnant and breastfeeding mothers about the importance of nutrition during pregnancy, educating them on healthy eating patterns, and monitoring children's nutritional status from birth to pre-school age to detect the risk of stunting early on.	The study revealed that stunting was significantly lower in areas where the intervention was delivered compared to the comparison areas (29% vs. 37%, P < 0.001). Furthermore, after adjusting for the administrative zone, household wealth quintile, child's age, gender, maternal age, education, occupation, cluster disparity, and variation between study groups, it was seen that the	Quasi-experimental	High: no baseline control, possible selection & reporting bias, confounding variables

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Authors, Country	Title	Characteristics	Intervention	Results	Study Design	Risk of Bias / Limitation
				risk of stunting was 25% lower in the intervention areas compared to the comparison areas (aOR: 0.75, 95% CI: 0.60–0.94; P = 0.012). Optimal child feeding practices were also more common among mothers from intervention areas than those of the comparison areas (exclusive breastfeeding: 72.7 vs. 59.4%, P = 0.008; feeding 4+ food groups: 42.9 vs. 34.1%, P < 0.001; having minimum acceptable diet: 31.2 vs. 25.3%, P = 0.017; feeding multiple micro-nutrient powders: 16.2 vs. 7.4%, P < 0.001).		
[14] Banerjee et al (2020) India	Disparity in childhood stunting in India: Relative importance of community-level nutrition and sanitary practices	Children under 5 years old	Government has launched several programs to address malnutrition and improve child health, such as the Integrated Child Development Services (ICDS) and the Midday Meal Scheme. These programs aim to provide health services, nutrition education, and supplementary food to children and pregnant or lactating mothers.	Overall, this study highlights the importance of community-level sanitation practices in influencing inter-state disparities in India, with the implication that interventions targeted at improving sanitation and nutrition at the community level can help reduce stunting in children.	Cross-sectional observational design	Medium-to-high risk: ecological bias, no causal inference, residual confounding, proxy measures from self-report
[15] Galasso et al (2019) Madagascar	Effects of nutritional supplementation and home visiting on growth and development in young children in Madagascar: a cluster-randomized controlled trial.	Early childhood (0-5 years)	The health team conducts structured home visits to provide iron, vitamin A, and folic acid supplements to children aged 24 months and up to provide nutritional education about food intake and monitor	Children who received micronutrient supplementation and regular home visits showed better growth than the control group, which received only standard care.	Cluster-Randomized Controlled Trial (RCT)	Low risk: strong design, but potential for variability across clusters and implementation inconsistencies

Authors, Country	Title	Characteristics	Intervention	Results	Study Design	Risk of Bias / Limitation
			child growth and development.			
[16] Juarez et al (2021) Guatemala	Community-Based Interventions to Reduce Child Stunting in Rural Guatemala: A Quality Improvement Model.	For children under 5 years old	The implementation was nutrition counseling, provision of additional food, or sanitation improvement.	These results suggest that adding structured performance visualization and audit and feedback components to existing community-based nutrition programs can significantly improve child health indicators by increasing adherence to evidence-based nutrition packages.	QI non-randomized pre-post	Medium: no control, potential confounders, aggregate analysis, implementation variability
[17] Soofi et al (2024) Afghanistan	Specialized nutritious foods and behavior change communication interventions during the first 1000 d of life to prevent stunting: a quasi-experimental study in Afghanistan.	Children aged 0 – 23 months, breastfeeding mothers, and pregnant women	Provide nutritious food for breastfeeding and pregnant mothers and children aged 0-23 months, and an education campaign to increase understanding of nutrition during the first 1000 days.	There was a decrease in the prevalence of stunting in children aged 0-23 months by 25% compared to the control group; children who received the intervention showed a significant increase in growth parameters such as body length and body weight for age.	Quasi-experimental	Medium-to-high risk: no randomization, implementation variability, possible confounders, dropout risk
[18] Yao et al (2022) China	Effect of a community-based child health counseling intervention on health-seeking behaviors, complementary feeding, and nutritional condition among children aged 6-23 months in rural China: A pre-and post-comparison study.	Children aged 6 – 23 months	Conducting health counseling that includes nutrition education, exclusive breastfeeding, providing nutritious complementary foods, and improving health service-seeking behavior.	Children from the intervention group showed significantly improved nutritional status compared to the control group.	Pre-post non-randomized study	**Medium–high risk**: no randomization/control, self-report data, potential secular trends, cannot confirm causality

Results

The 12 selected studies were conducted across diverse settings including Indonesia, Ethiopia, Bangladesh, Afghanistan, China, India, Madagascar, and Guatemala. Community based intervention was grouped thematically into three: nutritional education, water sanitation and hygiene (WASH) and supplementary food.

A. Nutritional education

Several study by Sutinbuk et al (2024), Andersen et al (2024), Atamou et al (2023), Mistry et al (2019), Juarez et al (2021), Yao et al (2022). Sutinbuk in his study explained that regular education about the importance of balanced nutrition and the importance of monitoring toddler health can improve stunting prevention behavior. Health cadres training, mother groups, and local leadership involvement enhanced outreach and adherence. In Indonesia, the ERKADUTA model led to improved maternal knowledge and more consistent stunting prevention behaviors, highlighting the importance of culturally grounded, community-based approaches [19]. Andersen et al. (2024) in India also demonstrated that providing education to pregnant and lactating women improved their knowledge and feeding practices, particularly related to exclusive breastfeeding and age-appropriate complementary feeding [20]. This aligns with Mistry et al. (2019), who found that maternal nutrition counseling reduced stunting prevalence from 37% to 29%, while also improving feeding behaviors such as dietary diversity and the use of micronutrient powders. Their study confirmed that increased knowledge, when combined with behavioral practice, results in measurable improvements in stunting prevention [21].

Moreover, Juarez et al. (2021) highlighted that adding structured feedback mechanisms (audit and feedback) to nutrition programs significantly enhanced adherence to evidence-based nutrition practices [22]. In China, Yao et al. (2022) found that counseling interventions improved the nutritional status of children aged 6–23 months compared to a control group [23]. Similarly, Atamou et al. (2023) reported that mothers who participated in community services such as posyandu (integrated health posts) were more likely to access healthcare services regularly and support the optimal growth and development of their toddlers [24].

Overall, community-based nutrition education has been proven to have multi-level effects—ranging from increased knowledge to improved practices. When implemented in a structured and consistent manner, this education can reduce the risk of stunting by improving feeding behaviors, increasing participation in growth monitoring, and enhancing the utilization of health services. This intervention is highly effective when supported by empowered community health workers (cadres), appropriate educational media, and cross-sectoral collaboration, including support from government and community leaders.

B. Water, Sanitation and Hygiene (WASH)

Two studies Ademas et al (2021), Zewdie et al (2021), addressed the role of WASH in stunting prevention. Ademas et al. (2021) in Ethiopia implemented a community program that included toilet construction, handwashing promotion, and maternal hygiene education. The intervention led to improved hygiene behaviors and a notable reduction in stunting among children under five [25]. Zewdie et al. (2021) identified poor sanitation practices, household food insecurity, and limited maternal education as significant predictors of stunting, suggesting that inadequate WASH conditions directly contribute to poor child growth [26] . Although WASH interventions alone may not directly improve nutritional intake, the analysis of these studies indicates that improved hygiene and sanitation environments are critical for maximizing the impact of nutrition-related programs. Frequent infections like diarrhea caused by poor sanitation hinder nutrient absorption and growth. Therefore, WASH should be considered a foundational element within broader community-based stunting prevention strategies.

C. Supplementary Food

Four studies Soofi et al (2024), Galasso et al (2019), Abera et al (2019), Banerjee et al (2020) explored the impact of supplementary feeding interventions on reducing stunting among children. Soofi et al. (2024) conducted a large-scale intervention in Afghanistan that combined specialized nutritious foods with behavior change communication targeting pregnant women and children under two years. The study reported a significant 25% reduction in stunting prevalence, alongside improvements in child weight-for-age and length-for-age z-scores [27]. Galasso et al. (2019) in Madagascar implemented a cluster-randomized controlled trial that provided micronutrient supplementation and home visits. The findings showed better linear growth in children from the intervention group compared to the control group receiving standard care [28].

In Indonesia, Abera et al. (2019) examined an integrated intervention combining supplementary feeding (through local food models), exclusive breastfeeding promotion, and micronutrient supplementation. The study revealed that these strategies led to a notable improvement in children's growth metrics, particularly among those who received vitamin A and iron in addition to adequate food intake [29]. Banerjee et al. (2020) emphasized the importance of addressing inter-state disparities in India through nutrition-sensitive interventions. Their analysis found that children in areas with community-based supplementary feeding programs and adequate sanitation infrastructure had significantly lower stunting prevalence compared to those in under-resourced regions [30].

The analysis of these studies suggests that supplementary feeding alone is beneficial, but its success is greatly enhanced when combined with education, behavior change support, and health service access. These interventions work best when tailored to local contexts, especially when using locally available foods, delivered consistently, and reinforced through community involvement. This indicates that effective stunting prevention must move beyond simply providing food it must also address the broader behavioral and environmental determinants of malnutrition.

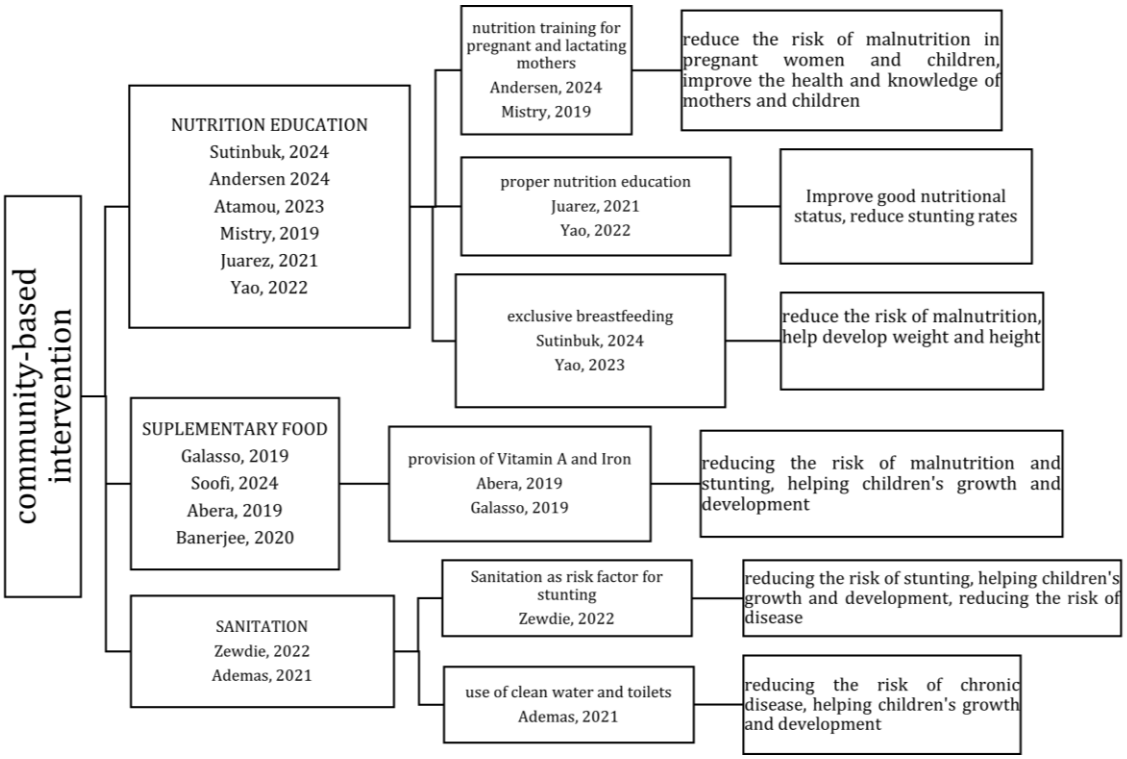


Fig 2. Mind Map

Discussion

A. Nutrition Education

The research shows that nutrition education can improve behaviors related to child feeding, including exclusive breastfeeding, appropriate complementary feeding, and dietary diversity. Community-based educational programs targeting pregnant and breastfeeding mothers have been associated with increased maternal knowledge and improved feeding practices, which in turn contribute to reductions in stunting prevalence. Structured counseling, when supported by growth monitoring and regular health promotion sessions, enhances behavior change and promotes better child health outcomes. Nutrition education is most effective when delivered consistently through local health workers, cadres, or mother support groups and reinforced by monitoring mechanisms at the community level [19] [20] [21] [22] [24] [23].

Additionally, nutrition education interventions that incorporate local food sources, respect cultural feeding norms, and use participatory learning methods are more likely to be accepted and sustained. Empowering health cadres through continuous training increases their confidence and capacity to deliver accurate nutrition messages. Furthermore, when caregivers are involved in peer-to-peer learning and supported by visible leadership within their communities, the likelihood of long-term behavior change increases. The sustainability of such programs depends not only on initial outcomes but also on the ongoing reinforcement of knowledge and skills through community engagement and health system support [31].

B. WASH

WASH interventions are essential in creating an enabling environment for effective stunting prevention. Poor sanitation and hygiene practices have been linked to increased incidence of diarrhea and environmental enteric dysfunction, both of which impair nutrient absorption and contribute to chronic undernutrition. Improvements in household access to clean water, the use of proper sanitation facilities, and hygiene education, especially for caregivers, have been shown to significantly reduce the risk of stunting. Though WASH interventions may not directly improve dietary intake, they are critical in supporting the success of nutrition-related programs by minimizing infection risks and improving nutrient utilization [25] [26] [30].

Community participation is also crucial in the implementation of WASH programs. When families are involved in the planning and maintenance of sanitation infrastructure, there is greater ownership and sustainability. Moreover, integrating hygiene promotion into regular health education sessions and involving school-based or faith-based organizations can broaden the reach of WASH messages. However, many WASH-related interventions reviewed did not evaluate long-term behavior change or infrastructure maintenance, indicating a gap in sustainability planning that should be addressed in future program designs [32].

C. Supplementary food

Supplementary feeding interventions have demonstrated strong potential in improving child growth, particularly when implemented during the first 1,000 days of life. These interventions typically involve the distribution of fortified foods, micronutrient powders, or locally produced complementary foods. Studies have shown that children who received supplementary feeding combined with behavior change communication and health monitoring had significantly better growth outcomes, including higher length for age and

weight for age z-scores. The greatest impact was observed when these programs were integrated with maternal education and regular follow-up. Community-based supplementary feeding programs using local food sources have been shown to be culturally appropriate and cost-effective when delivered consistently through existing platforms such as integrated health posts [27] [29][28] [30].

Nevertheless, challenges persist in maintaining the continuity and equity of supplementary food distribution, particularly in remote or resource-limited areas. Variations in program implementation, supply chain reliability, and community adherence can influence the effectiveness of the intervention. Moreover, without complementary behavior change efforts, the provision of food alone may not result in sustainable improvements. To address this, supplementary feeding programs should be aligned with broader multisectoral efforts that include nutrition education, maternal empowerment, and social protection schemes [33].

Conclusion

The results show that, out of 12 reviewed articles, six discussed nutrition education, four addressed supplementary feeding, and two focused on water, sanitation, and hygiene (WASH). These interventions represent the three major components commonly applied in community-based stunting reduction efforts.

Nutrition education interventions aimed at increasing caregivers' knowledge and changing behavior regarding child feeding. Outcomes observed included improvements in exclusive breastfeeding practices, timely initiation of complementary feeding, and better dietary diversity. These behavioral changes contributed to significant reductions in stunting prevalence, improved height-for-age z-scores (HAZ), and enhanced caregiver awareness of child nutrition and growth monitoring.

WASH interventions focused on improving household access to clean water, safe sanitation facilities, and hygiene behaviors such as handwashing with soap. These interventions reduced the incidence of infections such as diarrhea and environmental enteric dysfunction, which are known to impair nutrient absorption. As a result, children exposed to improved WASH conditions experienced better health environments that supported the effectiveness of nutrition programs and contributed to improved growth outcomes.

Supplementary feeding programs provided additional nutritional support to children and mothers during the critical first 1,000 days of life. These interventions included the distribution of fortified foods, micronutrient supplements (such as iron and vitamin A), and locally available nutrient-dense foods. The outcome of these programs included increased nutrient intake, improved weight-for-age and length-for-age scores, and reduced risk of stunting. Supplementary

feeding was most effective when combined with counselling and routine health monitoring through community health posts.

Overall, these findings highlight that multi-component interventions—when implemented at the community level—can address both direct and underlying causes of stunting and have measurable impacts on child nutrition and growth.

Conflict of Interest

The authors should declare that there is no conflict of interest.

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