

## Enhancing Maternal Health Literacy for Stunting Prevention: A Systematic Review of Effective Approaches and Strategies

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### ABSTRACT

**Background:** Stunting is a global health problem with a significant impact on the physical and cognitive development of children, particularly in developing countries. Health literacy, defined as an individual's ability to understand and utilize health information, plays an important role in preventing stunting. Low health literacy in many developing countries hampers the effectiveness of stunting prevention measures. **Objectives:** This study explores the roles, approaches, and effective strategies of health literacy in stunting prevention through a systematic review using the PRISMA method. **Method:** Data were collected from scientific databases such as Scopus, PubMed, ScienceDirect, Emerald Insight, and Taylor & Francis, using keywords including "health literacy," "stunting," "stunting prevention," "approach," and "strategy." The articles included in the study were published between 2020 and 2024. Out of 4,126 identified articles, nine met the inclusion criteria and were further analyzed. **Results:** Maternal health literacy significantly improved understanding of child nutrition, exclusive breastfeeding practices, and growth monitoring. Cultural, community, and technology-based approaches—including digital education through social media—proved effective in enhancing health literacy. Key barriers included limited access to information, low education levels, and cultural norms that challenged implementation. Cross-sector collaboration among government, health workers, and communities is crucial to ensuring sustainable strategies. **Conclusion:** Health literacy plays a vital role in preventing stunting. Community- and technology-based interventions tailored to local contexts have been effective in improving maternal health knowledge and practices. Implementing health literacy programs can support the achievement of national and global targets for stunting reduction.

**Keywords:** Approach, Health Literacy, Role, Strategy, Stunting

### INTRODUCTION

Stunting is a condition characterized by impaired growth and development due to chronic malnutrition affecting children worldwide (Anggraini & Rachmawati, 2021). It results from long-term nutritional deficiencies, which negatively impact both physical and cognitive growth in children (Purbandini, 2023). In 2012, the World Health Assembly (WHA) endorsed a comprehensive implementation plan on maternal, infant, and young child nutrition, setting six global nutrition targets for 2025, including a 40% reduction in the number of stunted children under five years old (World Health Organization, 2014). Additionally, Sustainable Development Goal (SDG) number 2 aims to eliminate all forms of malnutrition by 2030 (United Nations, 2022).

Globally, approximately 22.0% or 149.2 million children under five were stunted in 2020 (United Nations Children's Fund & World Health Organization, 2021). Regionally, the prevalence of stunting in Asia was recorded at 21.8%, while in Africa, the figure was higher, reaching 30.7% (United Nations Children's Fund & World Health Organization, 2021). Compared to these global and regional figures, Indonesia still faces significant challenges in reducing stunting. The national target is to decrease the prevalence of stunting to 14% by 2024, as outlined in the National Medium-Term Development Plan (RPJMN) (Ministry of Health, 2021). However, based on the results of the Indonesian Health Survey (IHS) in 2023, the stunting rate only decreased slightly from 21.6% in 2021 to 21.5% in 2022, indicating that progress

remains far from the target (BKPK, 2022). This persistent prevalence underscores the urgent need for more effective interventions to mitigate the long-term impacts of stunting on children's health and future development (Huriah et al., 2021).

Efforts to prevent stunting must begin within the family, including through educating parents on providing adequate nutrition during critical periods of child growth (Hadiyanto, 2024). Health literacy, defined as an individual's ability to access, understand, and use health information, is a key component of health promotion (Nutbeam, 2000). Improved health literacy has been shown to enhance the capacity to understand information related to nutrition, child healthcare, and healthy living practices necessary to prevent stunting (Ickes et al., 2015; Mazida et al., 2024).

Despite the implementation of various programs, stunting remains prevalent in developing countries, including Indonesia. This persistence is partly due to low health literacy, especially among mothers, which affects nutrition and child health decisions (WHO, 2018; World Bank, 2021). Good health literacy enables parents to better understand their children's nutritional needs and the importance of proper health practices to prevent stunting (Ickes et al., 2015; Kickbusch et al., 2013).

In recent decades, various approaches have been developed to improve health literacy among mothers. Cultural, educational, and community-based strategies are considered effective, particularly when tailored to local contexts to ensure that mothers understand the importance of proper nutrition and health practices (EUPHA, 2023; Flecha et al., 2011). Additionally, community-based approaches involving active participation of local residents have been shown to strengthen social support networks and improve access to relevant health information (Monani et al., 2021). In today's digital age, digital health literacy has emerged as an innovative strategy for stunting prevention, especially through social media and digital platforms that facilitate wider dissemination of health information (Levin-Zamir & Baron-Epel, 2020; Mårtensson & Hensing, 2011). However, challenges such as the digital divide—where certain groups have limited

access to information technology—pose obstacles to its implementation (Shaw, 2023).

While numerous studies have explored the relationship between health literacy and stunting incidence (Kickbusch et al., 2013; Nutbeam, 2008; WHO, 2018), there remains a gap in understanding the most effective strategies to improve health literacy for preventing stunting across different social and cultural contexts. Many previous studies have focused on individual education without considering community-based approaches and the role of technology in enhancing mothers' understanding and practices related to nutrition. Additionally, strategies often overlook socio-economic barriers, limited access to information, and cultural factors that influence community health practices (Levin-Zamir & Baron-Epel, 2020; Mårtensson & Hensing, 2011; Shaw, 2023).

Furthermore, there is disagreement regarding the most effective strategies for integrating health literacy into stunting prevention programs (Lindberg et al., 2022; Nugroho et al., 2024). Therefore, a systematic review is necessary to identify and summarize the most effective approaches for integrating health literacy into stunting prevention efforts (Lindberg et al., 2022; Nugroho et al., 2024). Consequently, this study aims to answer the following questions: What is the role of health literacy in stunting prevention? What are the most effective approaches and strategies for improving health literacy to prevent stunting? This article, therefore, seeks to conduct a systematic review of the role of health literacy in stunting prevention and to identify the most effective strategies for integrating health literacy into prevention programs.

## METHODS

This article was prepared using a systematic review design following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach (Haddaway et al., 2021). The data referenced in this study were sourced from international scientific publications in the Scopus, PubMed, ScienceDirect, Emerald Insight, and Taylor & Francis databases. The criteria utilized in this study were based on the PICOS framework as follows:

- **P (Population and their problem):** The target populations included mothers and caregivers of children under five years old, pregnant women, and healthcare providers.
- **I (Intervention):** A health literacy program, educational intervention, or communication strategy aimed at increasing knowledge and understanding of stunting prevention.
- **C (Comparison):** Standard care, no health literacy intervention, or other types of stunting prevention strategies.
- **O (Outcome):** Outcomes measured included improved health literacy, increased exclusive breastfeeding rates, better child nutrition, and reduced stunting rates.
- **S (Study type):** All study types were considered.

The data search process employed relevant keywords such as "literacy," "health literacy," "stunting," "stunting prevention," "role," "approach," and "strategy." Boolean operators were used to combine keywords to obtain more focused and specific results. The articles were searched within a publication period of five years, starting from 2020. The initial search yielded 4,126 articles, which were then screened based on inclusion criteria and relevance to the research. The article selection process is illustrated in the PRISMA flow diagram presented in Figure 1 below.

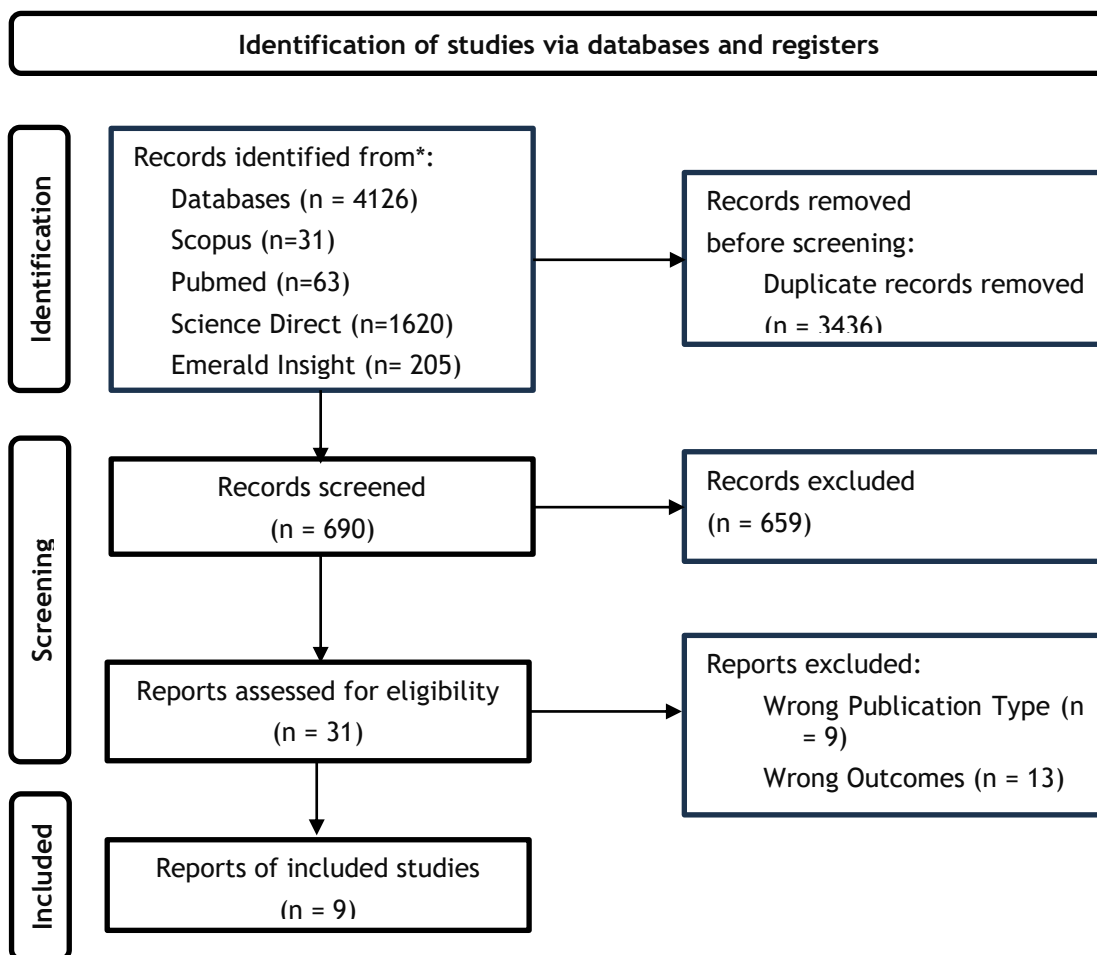


FIGURE 1. PRISMA flow diagram

Figure 1 illustrates the stages involved in the article reference search process. Subsequently, the researchers grouped articles related to the role of health literacy in stunting prevention and identified effective approaches and

strategies for integrating health literacy into stunting prevention programs. The systematic review employed a descriptive method as the analytical approach, aligned with the chosen topic, with the aim of presenting the research findings from the

literature in a narrative format. This descriptive approach was used to collect and examine evidence in order to answer the research questions in a comprehensive and narrative manner.

## RESULTS AND DISCUSSION

Upon selection, 4,126 articles were identified from various databases, including Scopus (31), PubMed (63), ScienceDirect (1,620), Emerald Insight (205), and Taylor & Francis (2,207). After removing 3,436 duplicate articles, 690 articles remained for further screening. During the screening process, 659 articles were excluded for not meeting the inclusion criteria, leaving 31 articles to be assessed for eligibility. The inclusion criteria required studies to: (1) examine the relationship between health literacy and stunting prevention; (2) involve populations such as mothers, caregivers, pre-marital couples, or communities contributing to stunting prevention; (3)

utilize observational (cross-sectional, case-control, cohort) or intervention (experimental, quasi-experimental) study designs; (4) report measurable outcomes related to stunting prevalence, health literacy improvements, or nutritional status changes; (5) be published between 2020 and 2024; and (6) be written in English. After applying these criteria, 31 articles were assessed for eligibility. During this phase, 22 articles were further excluded due to irrelevant publication types (9 articles) or findings that did not align with the study objectives (13 articles). Ultimately, 9 studies met the criteria and were included in the systematic analysis. This process demonstrates a rigorous selection approach to ensure that only relevant studies were incorporated into this systematic review. The main articles used in the systematic assessment are summarized in Table 1 below.

**Table 1.** Summary of Findings

Author	Year	Findings
Jiregna et al.	2024	<p>Most women (71.3%) have an inadequate level of health literacy. This has a negative impact on the understanding of child nutrition and health care, which are important factors in stunting prevention.</p> <p>Factors such as place of residence (urban vs. rural) and number of antenatal care (ANC) visits are associated with health literacy levels. Approaches and strategies that improve access to health services and health education contribute to improved health literacy.</p>
Mazida et al.	2024	<p>There is a significant relationship between maternal health literacy and the incidence of stunting in toddlers, with a p-value of 0.001. Mothers with better health literacy tend to have children who are not stunted.</p> <p>Mothers who have better access to health information and engage in good parenting practices have a lower risk of having stunted children.</p>
Sirajuddin et al.	2021	<p>Interventions focusing on maternal nutrition literacy significantly reduce the prevalence of stunting in children. In the intervention group, there was a decrease in the percentage of stunting from 23.3% to 14% (<math>p=0.046</math>), indicating that improved maternal nutrition knowledge and practices contribute to the improvement of children's nutritional status.</p> <p>Interventions involving education, practice simulation and regular monitoring of children's growth are more effective in improving literacy.</p>
(Lindberg et al., 2022)	2022	<p>Mothers have a good awareness of the causes of malnutrition, but lack the knowledge and skills to recognize and address the problem. Mothers actively requested more information and education on how to prevent and treat malnutrition.</p> <p>Social and economic conditions, such as poverty and cultural norms, affect mothers' ability to manage their children's nutrition.</p>
Putri et al.	2024	<p>Factors that contribute to the low health literacy in Baduy community include illiteracy, cultural taboos that limit the consumption of nutritious food, and lack of access to health information.</p> <p>Strategies to improve health literacy in Baduy communities include the development of health education programs involving community leaders and the use of information technology to disseminate health information.</p>

Author	Year	Findings
Kumeh et al.	2020	Mothers with better literacy levels are more likely to have children who are not malnourished. Although formal education level is not always directly related to nutritional status, literacy provides mothers more power and ability to make better decisions regarding child care and feeding.  Structural barriers, such as poverty and food insecurity, prevent mothers from applying the correct knowledge of feeding and healthcare practices.
Asriadi et al.	2023	The use of culture-based educational videos significantly improves public health literacy regarding stunting.  The improvement in health literacy after the intervention showed no significant difference between the two cultural groups (Makassar and Bugis), indicating that this approach can be widely applied in various communities to improve health literacy in stunting prevention efforts.
H. Huriah et al.	2023	The education level of parents, especially mothers, has a significant influence on the knowledge of stunting and its prevention.  Access to and understanding of the right information on stunting is essential to build good knowledge among parents.
Nugroho et al.	2024	93.9% of respondents understood the phenomenon of stunting, and 75.8% recognized the difference between stunting and malnutrition. 75.8% of respondents were confident in using health apps to detect stunting in children.  Digital health literacy of rural communities regarding stunting applications is adequate

Based on the selected articles, the study focused on health literacy in stunting prevention in three main topics, namely roles, approaches and strategies.

### The Role of Health Literacy in Stunting Prevention

Maternal health literacy plays a crucial role in preventing and reducing the stunting rate among children under five. Mothers with high health literacy tend to better understand the importance of providing nutritious food and implementing optimal health management for their children's growth and development (Ickes et al., 2015). A good knowledge of children's nutritional needs enables mothers to provide age-appropriate diets and avoid feeding errors that can contribute to malnutrition (Jiregna et al., 2024). Additionally, mothers with good health literacy are more likely to monitor their children's growth regularly, which helps in early detection and timely intervention of stunting issues.

Maternal health literacy levels are strongly associated with child nutritional status. Mothers who possess better knowledge of nutrition and healthy parenting practices—such as exclusive breastfeeding and the provision of nutritious complementary foods—tend to have children with better nutritional

outcomes (Kumeh et al., 2020). Conversely, mothers who lack an understanding of the importance of nutrition or are unaware of how to properly manage their children's diets are at higher risk of having stunted children due to prolonged malnutrition. Research by Ickes et al. (2015) showed that mothers with high levels of health literacy are more likely to avoid feeding errors that could worsen their children's nutritional status (Ickes et al., 2015).

Furthermore, improving maternal health literacy is directly linked to reductions in stunting. Mothers with better health literacy are more capable of accessing information on nutrition and child care, and they tend to participate proactively in existing health programs such as immunization and growth monitoring. These efforts help prevent stunting by ensuring children are adequately nourished and developing properly (Mazida et al., 2024).

However, several factors can either support or hinder the role of health literacy in stunting prevention. Supporting factors include maternal access to accurate health information, adequate healthcare facilities, and sufficient education, which enable mothers to acquire appropriate knowledge regarding a healthy diet and the importance of monitoring their children's health (Putri et

al., 2024). Conversely, barriers include low levels of education, limited access to information, and cultural factors that influence mothers' perceptions of child care (Jiregna et al., 2024). In certain communities, especially in rural or remote areas, limited access to health information and healthcare services significantly impede improvements in maternal health literacy.

In summary, maternal health literacy is vital in stunting prevention, as it empowers mothers to understand the importance of proper nutrition and child health management. Mothers with high health literacy are more likely to provide appropriate dietary intake, monitor their children's growth, and avoid feeding errors that could lead to malnutrition (Ickes et al., 2015; Jiregna et al., 2024). Enhancing maternal health literacy is also associated with reduced stunting, as literate mothers are better equipped to access nutrition information, utilize health services, and ensure their children's nutritional needs are met (Mazida et al., 2024). Despite these benefits, challenges such as low education levels, limited access to information, and cultural influences remain significant barriers, especially in remote areas (Jiregna et al., 2024; Putri et al., 2024). Therefore, improving access to accurate health information and education is a critical step toward sustainably addressing stunting.

#### **Approaches to Enhancing Health Literacy for Stunting Prevention**

Effective approaches to improving maternal health literacy in stunting prevention involve integrated strategies that include formal education, specialized skills training, and community-based methods. One proven effective approach is through structured health education programs, which provide mothers with basic knowledge of nutrition and child care. Proper education enhances mothers' understanding of the importance of nutritious feeding and developmentally appropriate parenting (Ickes et al., 2015). Additionally, community-based approaches, such as the Posyandu (integrated health service center) program, enable mothers to access information directly from trained health workers, thereby improving their understanding of child growth monitoring

and stunting prevention (Jiregna et al., 2024).

Health literacy programs focusing on maternal nutrition can significantly reduce the stunting rate. Interventions that emphasize mothers' ability to provide the right foods and maintain hygiene during a child's early years have been shown to lower the prevalence of stunting more effectively in the intervention group than in the control group. Such programs are crucial for raising mothers' awareness of healthy diets and good parenting practices, which directly contribute to stunting prevention (Sirajuddin et al., 2021).

Culture-based approaches also play an important role in enhancing health literacy within communities. In communities with strong values and traditions—such as the Baduy community in Indonesia—approaches that respect local culture help deliver health information more effectively. Tailoring health education to local cultural values, involving community leaders, and using familiar cultural symbols increase community acceptance of the information provided (Putri et al., 2024). Furthermore, studies have demonstrated that culture-based educational videos in South Sulawesi are effective in improving community understanding of stunting by utilizing media that are culturally relevant and easy to comprehend (Asriadi et al., 2023).

In the digital era, technology and social media also play a significant role in enhancing health literacy, especially in areas with internet access. Digital platforms such as Instagram or online educational videos enable broader dissemination of health information that is accessible at any time. Social media can convey messages about stunting prevention in formats that are easy to understand, such as infographics and short videos (H. Huriyah et al., 2023). However, the successful use of technology depends on accessibility, particularly in rural areas with limited technological infrastructure. Lindberg et al. (2022) caution that programs utilizing technology should be adapted to the capacity of the local community and integrated with other community-based approaches.

Overall, an effective strategy to improve maternal health literacy related to stunting prevention should be comprehensive, combining formal

education, culturally tailored approaches, and technological tools. Locally relevant education—such as culture-based videos and engagement with community leaders—strengthens mothers' understanding of the importance of nutrition and proper parenting (Asriadi et al., 2023; Putri et al., 2024). Meanwhile, technology and social media offer opportunities to expand the reach of health education, although implementation must account for community access and capacity (H. Huriah et al., 2023). Health literacy programs that focus on maternal nutrition have demonstrated success in reducing stunting by increasing mothers' awareness of proper feeding and hygiene during early childhood—directly contributing to stunting prevention (Sirajuddin et al., 2021). With a holistic, locally adapted approach, maternal health literacy can be significantly improved, ultimately aiding in community-wide stunting prevention (Ickes et al., 2015; Jiregna et al., 2024; Putri et al., 2024).

#### **Strategies for Integrating Health Literacy into Stunting Prevention Programs**

Integrating health literacy into stunting prevention programs requires a coordinated approach that focuses on empowering mothers and communities. One effective strategy is empowerment through education at Posyandu and Puskesmas (community health centers), which serve as information hubs for mothers and families. Education provided at these health facilities helps mothers understand the importance of exclusive breastfeeding, healthy diets, and monitoring their children's growth and development—key steps in preventing stunting (Jiregna et al., 2024).

In addition, visual materials such as posters, infographics, and educational videos enhance the comprehension of mothers with low literacy levels, helping them grasp essential information about child health (Ickes et al., 2015). Mobile health apps are also an effective tool for delivering nutrition and stunting-related information to rural mothers. With locally appropriate digital literacy training, mothers in these areas can easily access vital information on child care, proper nutrition, and stunting prevention measures through their digital devices (Nugroho et al., 2024). Furthermore, training community health cadres and

volunteers to provide culture-based counseling has proven effective in improving health literacy in rural settings (Kumeh et al., 2020).

Cross-sector collaboration enhances efforts to improve health literacy related to stunting by integrating various sectors such as health, education, social services, and government. This collective effort allows for better resource utilization, increased accessibility, and a more comprehensive approach to health education. For example, collaboration with the education sector—such as integrating health literacy into primary school or early childhood education curricula—can foster an understanding of nutrition and health from an early age, as demonstrated by Lindberg et al. (2022) (Lindberg et al., 2022). Additionally, empowering local communities through cadre or volunteer training supported by the social sector and local government can expand the reach of health literacy into remote areas (Kumeh et al., 2020).

However, implementing health literacy strategies faces significant challenges, especially related to limited access, cultural barriers, and educational disparities. Several studies highlight that low maternal education levels are a major obstacle to understanding and applying health information effectively (Ickes et al., 2015). Cultural challenges, such as those encountered in Mozambique, further hinder mothers' access to and comprehension of health information (Lindberg et al., 2022). Therefore, it is crucial to tailor approaches to the local social and cultural context. For example, in the Baduy community in Indonesia, culture-based counseling proved effective in improving community understanding of stunting prevention (Putri et al., 2024). These challenges can be addressed by utilizing community- and culture-based approaches, which make information more relevant and relatable.

Overall, strategies for integrating health literacy into stunting prevention require a holistic approach that involves cross-sector collaboration and adaptation to local contexts. Collaboration among health, education, social, and government sectors can improve access to information and empower mothers to adopt health practices that prevent stunting. By addressing existing challenges and leveraging opportunities through culture-

based approaches and technology, health literacy can be significantly enhanced, ultimately contributing to more effective stunting prevention (Ickes et al., 2015; Jiregna et al., 2024; Kumeh et al., 2020; Lindberg et al., 2022; Putri et al., 2024).

## CONCLUSION

Improving health literacy plays a vital role in stunting prevention by enabling mothers to understand and apply nutrition information necessary for supporting optimal child development. Community-based, culturally sensitive, and technology-driven education strategies have proven effective in enhancing community understanding, although challenges such as limited access to information and cultural barriers remain. Integrating health literacy into stunting prevention programs requires a comprehensive approach that involves cross-sectoral collaboration, adaptation to local conditions, and community empowerment to overcome structural barriers such as poverty and food insecurity. Further research is needed to identify effective methods for improving health literacy that address specific structural and cultural challenges. With appropriate intervention design, it is possible to significantly reduce stunting rates and support the achievement of national and global health targets.

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