Nutrition Counseling and Stunting Prevention in Toddlers: A Systematic Literature Review

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Doi: 10.31316/g-couns.v9i2.7115

Abstract

Stunting in children is a serious global nutrition issue that long-term impacts health and development. This study aims to analyze the role of nutrition counseling in preventing stunting through a systematic review of 162 articles from databases such as PubMed, Google Scholar, Semantic Scholar, and Scopus, with 16 articles meeting the criteria for further analysis using NVivo and Biblioshiny. The results show that nutrition counseling can improve nutritional knowledge and child growth, although its effectiveness varies across studies. Some research, such as Nadimin et al. (2021) and Christian et al. (2020), indicates that while counseling does not directly reduce the prevalence of stunting, it does raise parental awareness about healthy feeding practices. In conclusion, a comprehensive approach is needed, including family involvement and improved access to healthcare services. Further research is recommended to broaden the scope and explore the long-term impact of these interventions.
Keywords: counseling, nutrition, stunting, toddlers, systematic literature review

Abstrak

Stunting pada balita adalah masalah gizi serius yang berdampak jangka panjang pada kesehatan dan perkembangan anak. Penelitian ini bertujuan menganalisis peran konseling gizi dalam pencegahan stunting melalui tinjauan sistematis terhadap 162 artikel dari basis data seperti PubMed, Google Scholar, Semantic Scholar, dan Scopus, dengan 16 artikel yang memenuhi kriteria untuk analisis menggunakan NVivo dan Biblioshiny. Hasilnya menunjukkan bahwa konseling gizi berpotensi meningkatkan pengetahuan gizi dan pertumbuhan anak, meski efektivitasnya bervariasi. Beberapa studi, seperti yang dilakukan oleh Nadimin et al. (2021) dan Christian et al. (2020), mengindikasikan bahwa meskipun konseling tidak secara langsung menurunkan prevalensi stunting, intervensi ini meningkatkan kesadaran orang tua tentang praktik pemberian makan sehat. Kesimpulannya, pendekatan komprehensif diperlukan, termasuk keterlibatan keluarga dan peningkatan akses layanan kesehatan. Penelitian lebih lanjut disarankan untuk memperluas cakupan dan mengeksplorasi dampak jangka panjang intervensi ini.
***Keywords**: konseling, gizi, stunting, balita, tinjauan literatur sistematis*

Article info
Received October 2024, accepted February 2025, published April 2025

INTRODUCTION

Stunting is a chronic condition that describes growth failure in children due to long-term malnutrition, especially in the first 1,000 days of life, from pregnancy to age two. Children who experience stunting have a much lower height than children of the same age, accompanied by stunted cognitive development (Suratri et al., 2023). However, the impact of stunting is not limited to the physical aspect; stunting also affects mental development, learning ability, and endurance and increases the risk of degenerative diseases such as diabetes and heart disease in the future (Yani et al., 2023). The root causes of stunting are very complex and include various factors, ranging from poor maternal nutritional intake during pregnancy to inadequate sanitation, high incidence of infection, and lack of access to quality health services (Fitriani et al., 2022). Lack of protein, vitamins, and essential minerals during a child's critical growth period will disrupt the formation of body and brain cells that cannot be restored, creating long-term impacts that are difficult to overcome (Elwan et al., 2022).

In Indonesia, the prevalence of stunting is still a major challenge in efforts to improve the quality of human resources. This problem is related to the lack of access to nutritious food. However, it is also influenced by socio-economic conditions, education levels, parenting patterns, and culture and eating habits in the family. Many children born in rural or poor areas experience stunting due to the lack of clean water, poor sanitation, and minimal basic health services (Mediani et al., 2022). A holistic approach is needed in prevention efforts, from increasing awareness of the importance of nutritional intake during pregnancy and after childbirth to providing integrated health services with sustainable interventions. The government, NGOs, and the private sector must work together to create an environment that supports child growth, both in terms of nutrition, sanitation, and education, so that stunting can be suppressed and the future generation of Indonesia can grow up healthy, smart, and productive. In 2022, 148.1 million children under 5 years of age were too short for their age (stunting), 45.0 million were too thin for their height (wasting), and 37.0 million were too heavy for their height (overweight) (WHO, 2022). As an illustration, the prevalence of stunting in Indonesia tends to fluctuate yearly. It increased in the period 2010-2013, then decreased in the period 2014-2018. Furthermore, in 2021, the results of the Indonesian Nutritional Status Survey (SSGI) showed a decrease in the prevalence of 3.3% to 24.4%, and in 2022, it decreased to 21.6% (BRIN, 2023).

Stunting or failure to thrive in children due to chronic malnutrition has serious short-term impacts on children's health and development (Tello et al., 2022). Children who experience stunting generally have a weak immune system, making them more susceptible to infections such as diarrhoea and pneumonia (Louis et al., 2022). In addition, stunting also affects children's brain development and cognitive function, causing delays in motor development and slower learning abilities compared to children of the same age. These impacts can hinder children's ability to interact with their surroundings and excel in school. In the long term, stunting can permanently affect children's health and future (Arisandi et al., 2022). Stunting not only has an impact on shorter stature as adults but also increases the risk of degenerative diseases such as diabetes, hypertension, and heart disease. In addition, delays in cognitive development experienced during childhood can affect academic ability and productivity in adulthood (Halli et al., 2022). This stunting can impact employment opportunities, income, and overall quality of life. Therefore, early prevention and treatment of stunting is crucial to ensure children reach their maximum potential.

Adequate nutrition plays a central role in supporting children's physical growth, especially during the critical growth period of the first 1,000 days of life, which starts from pregnancy to the age of two (Nasriyah & Ediyono, 2023). Balanced nutrition ensures that the child's body obtains macronutrients such as carbohydrates, proteins, and fats, which function as sources of energy and building materials for cells and tissues (Retnaningtyas et al., 2022). Protein, for example, is essential for developing muscles, bones, and vital organs. Meanwhile, micronutrients such as vitamins and minerals, especially iron, calcium, and vitamin D, play an important role in supporting the development of strong bones and maintaining the function of the immune system. When these nutritional needs are unmet, children risk experiencing stunted growth or even stunting, which can have long-term health impacts (Jelmila et al., 2023). Therefore, providing nutritious and balanced food is crucial to ensure children achieve optimal physical growth according to age.

Nutrition is important for physical growth and plays a fundamental role in children's brain development and cognitive function (Widiawati & Haryani, 2023). Nutrients such as omega-3 fatty acids, found in fish and nuts, are essential for developing brain structure and function, especially in improving cognitive abilities such as memory, attention, and critical thinking skills. In addition, nutrients containing iron and vitamin B12 help produce red blood cells that carry oxygen to the brain, which is essential for optimal cognitive function. Nutritional deficiencies, such as iron deficiency, can result in decreased learning ability, behavioural disorders, and delays in language and communication development (Nugroho et al., 2023). Therefore, providing adequate nutrition from an early age is the foundation for healthy intellectual development in children, allowing them to learn better and achieve their maximum academic potential.

Nutrition counseling is one of the important interventions in preventing stunting because it can provide appropriate education to parents and caregivers about the importance of balanced nutritional intake during a child's growth period. Through nutritional counseling, experts can help families understand children's nutritional needs based on age, including the important role of micronutrients such as iron, zinc, and vitamin A in preventing chronic malnutrition, which is the main cause of stunting (Hapsari et al., 2023). This counseling also helps families identify unbalanced diets and recommends affordable and nutritious local foods. With the right information, families can improve the quality of children's nutritional intake from an early age, which is important in supporting optimal growth and development and preventing stunting.

Furthermore, nutritional counseling provides an opportunity to monitor children's growth regularly, identify early signs of malnutrition, and intervene as early as possible (Melinda et al., 2023). Nutrition counsellors can also work with health care providers to provide needed nutritional supplementation, such as iron or vitamin supplements, to ensure that children get adequate nutritional intake. With a personalized and evidence-based approach, nutritional counseling helps address families' specific challenges, such as economic constraints or access to nutritious food. Therefore, nutritional counseling plays a strategic role in preventing stunting effectively by empowering families to create a nutritional environment that supports optimal child health and development (Puspitasari et al., 2023). To strengthen understanding of the importance of nutritional counseling in preventing stunting, a systematic literature review is needed to explore scientific evidence related to the effectiveness of this intervention. A systematic literature review can identify various studies that have been conducted in various contexts, examining the impact of nutritional counseling on improving the nutritional status of toddlers and reducing the

prevalence of stunting. Through structured analysis, this review will also highlight the success factors of nutrition counseling, such as frequency of sessions, involvement of health workers, and barriers faced in program implementation. Thus, the results of this review can provide a strong foundation for designing more effective policies and programs in stunting prevention, as well as strengthening evidence-based approaches in nutrition interventions at the family and community levels.

METHOD

Research Design

The Systematic Literature Review (SLR) method is a structured and comprehensive research approach to identify, assess, and synthesize literature relevant to a particular research topic (Shafira et al., 2024). In this study, the SLR method was used to explore and understand the role of nutritional counseling in preventing stunting in toddlers. The SLR process begins with determining a clear research question, followed by a systematic literature search through trusted academic databases (Silviawi & Darmayanti, 2024). Each study was evaluated based on strict inclusion and exclusion criteria to ensure its relevance and quality. Furthermore, data from selected studies were analyzed and synthesized to identify key findings, research gaps, and practical implications. SLR offers a comprehensive and evidence-based view of the topic under study so that the results can be used as a strong basis for developing more effective policies or interventions in preventing stunting through nutritional counseling.

Inclusion and Exclusion Criteria

Inclusion and exclusion criteria are important aspects of research methodology that ensure the literature analyzed in a systematic review is relevant and high-quality (Munawaroh & Setiyowati, 2024). In the context of this study, inclusion criteria were designed to select articles that specifically discuss the role of nutritional counseling in preventing stunting in toddlers. The following is Table 1, containing the specified inclusion and exclusion criteria:

Table 1.
Inclusion And Exclusion Criteria

Criterion	Inclusion	Exclusion
Year of Publication	Articles published between 2019–2024.	Articles published before 2019.
Key Topics	Research that discusses counseling AND stunting AND nutrition AND malnutrition	Research that does not discuss counseling, stunting, nutrition and malnutrition
Type of Study	Empirical studies (quantitative/qualitative), systematic reviews, or relevant meta-analyses.	Articles are in the form of comments, editorials, opinions, or readers' letters without any basis for empirical research.
Population	The study involved toddlers (ages 0-5 years) in various contexts, especially in developing countries.	Studies involving populations other than toddlers (e.g., school-age children, adolescents, or adults).
Language	Articles are written in English or Indonesian.	Articles written in languages other than English or Indonesian.
Accessibility	Articles are available in full text and can be accessed through journals or academic repositories.	Articles are only available as abstracts or require a subscription fee without access to full-text.

By applying these criteria, it is hoped that this systematic literature review can present accurate and relevant findings, contributing to a deeper understanding of stunting prevention through nutritional counseling.

Data Source

The data sources used in this study include several leading academic databases that can be relied upon to access high-quality scientific literature. Databases such as PubMed, Google Scholar, Semantic Scholar and Scopus were selected because they provide extensive access to articles, journals and related studies on health and nutrition. The publications reviewed in this systematic literature review were limited to 2019 to 2024, thus allowing researchers to obtain the latest and relevant information on nutritional counseling and stunting prevention in children under five. Using these databases ensures that the analysis is based on the latest evidence and contributes to a deeper understanding of the studied issue.

Literature Search Process

The literature search process is a crucial stage in this study, which aims to identify and select relevant articles on nutritional counseling and to prevent stunting in toddlers. In the search strategy, keywords such as counseling AND stunting AND nutrition AND Malnutrition were used to optimize search results in various academic databases, including PubMed, Semantic Scholar, Google Scholar, and Scopus. The following table 2 explains the prism procedure carried out in this study.

Table 2.
Flowchart Of The Article Search And Selection Process

Component	Information	Information
Identification		Data collection from the Scopus database with the keywords counseling AND stunting AND nutrition AND Malnutrition (N=162)
Screening	Selected article N=162	Excluded records (n = 62) year of publication less than 2019)
	Articles retrieved (n = 100)	Articles not picked up (n = 6) are excluded from the publication type.
	Articles taken N=94	Articles excluded by publication type (n = 1)
	Articles rated for analysis N=93	Excluded records (n=81) Articles are excluded because they do not meet the title, abstract and research keywords criteria.
include	Studies included in the review (n = 16)	

Through these steps, it is hoped that quality and relevant literature can be obtained for an in-depth analysis of the role of nutritional counseling in preventing stunting.

Data Analysis

Data analysis in this study was conducted using a systematic analysis method to synthesize findings from selected articles. The data extraction process involved collecting important information related to nutritional counseling interventions, the characteristics of the population studied, research findings, and the methodological quality of each study. To facilitate this analysis process, Biblioshiny and R Studio software were used to

effectively manage and analyze bibliographic data. At the same time, NVivo 14 was utilized to analyze qualitative data emerging from the articles. Using Biblioshiny, researchers can easily generate data visualizations and summaries, which help understand patterns and trends in the existing literature. Furthermore, NVivo 14 allows researchers to conduct a more in-depth thematic analysis, categorization of counseling interventions, and relevant research findings. Through this approach, it is hoped that a comprehensive and evidence-based synthesis can be produced regarding the effectiveness of nutritional counseling in preventing stunting in toddlers.

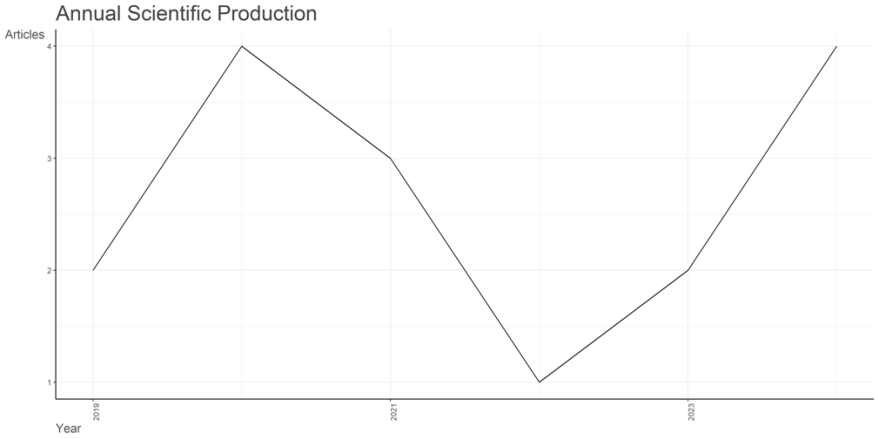
RESULT AND DISCUSSION

Result

Figure 1. Data analysis

Based on the results of the bibliometric analysis of the study related to "Nutrition Counseling and Stunting Prevention in Toddlers: A Systematic Literature Review," it can be seen that during the period 2019 to 2024, there were 16 documents that were the subject of the study, with an annual growth rate of 14.87%. This study involved 79 authors, with no documents with a single author, indicating strong collaboration, where, on average, each document was written by five authors. As many as 50% of the documents resulted from international collaboration, indicating cross-country collaboration. 50 keywords were used, which most likely included terms related to nutrition counseling, stunting, and toddler health. The average age of the documents analyzed was 2.44 years, indicating that this study was based on relatively new and relevant data. Each document received an average of seven citations, reflecting the significant impact of the literature on stunting prevention in toddlers. Although no references were reported, these results indicate that research in this field is growing rapidly and contributing to the understanding and developing stunting prevention strategies through nutrition counseling.

Graph 1.
Annual Scientific Production



The increase in scientific production related to nutrition and stunting prevention shows the increasing attention from the scientific community. Graph 2 above illustrates the trend of scientific production during the period 2019 to 2023. There is a significant fluctuation in the number of scientific articles produced yearly. Article production peaked in 2020 with the highest number of 4 articles, followed by a sharp decline in 2022 with only 1 article produced. However, in 2023, there was an increase in the number of articles published, indicating a positive trend in research productivity. Further analysis results show a significant downward trend in the number of citations since 2019 to reach its lowest point in 2021. However, there was a slight increase in 2022 and 2023, although still below the initial average.

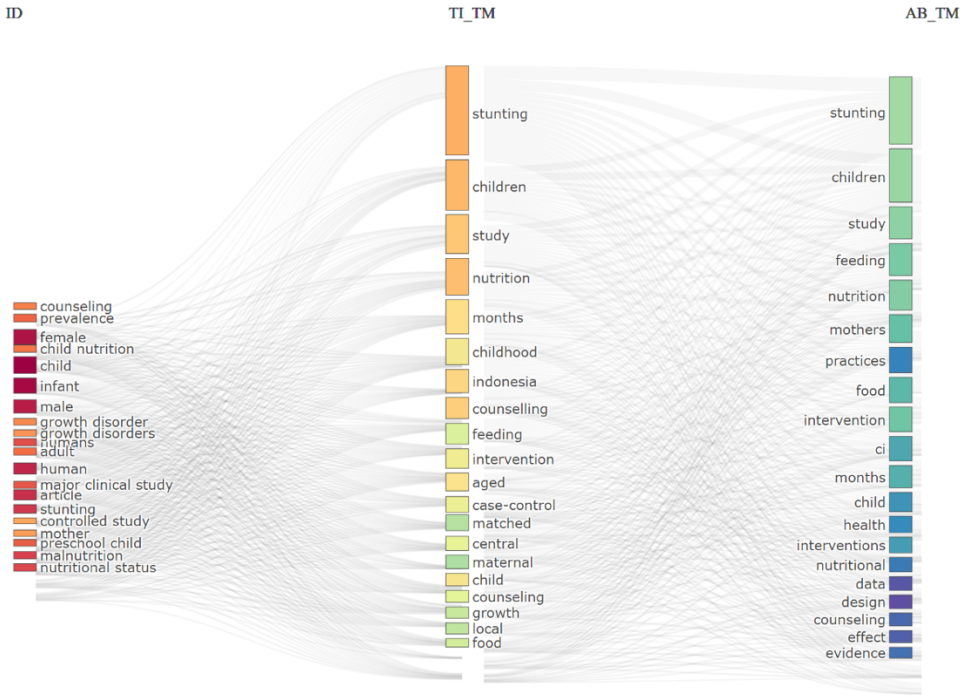
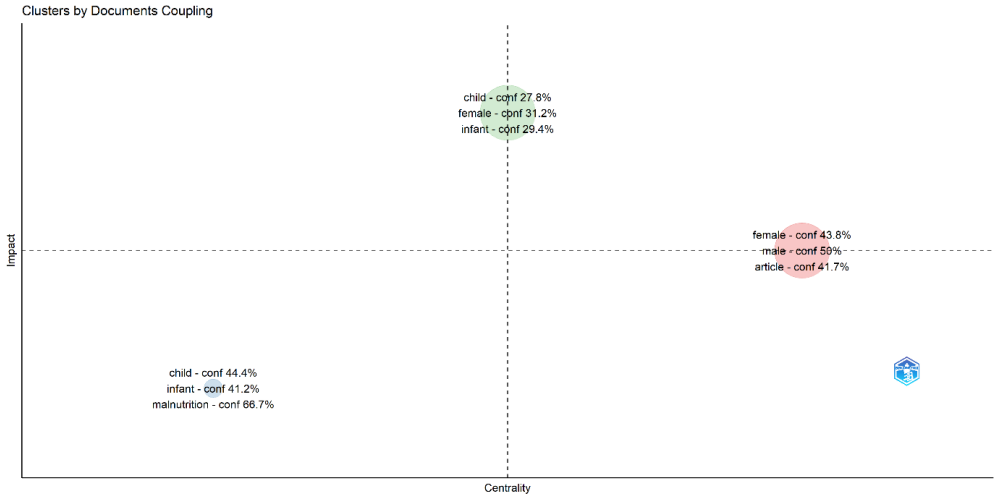


Figure 2. Relationship Of Studies

The keyword network diagram shows the close relationship between various topics in the study "Nutrition Counseling and Stunting Prevention in Toddlers." Keywords such as counseling, prevalence, female, child nutrition, infant, male, and stunting are the focus of various parts of the study, including the title, abstract, and description. Topics frequently appearing in the title include stunting, children, nutrition, childhood, and counseling, emphasizing the importance of stunting and child nutrition. In the abstract, words such as feeding, mothers, intervention, health, and evidence stand out, highlighting the role of nutritional interventions, maternal feeding practices, and health in preventing stunting. The word Indonesia appears to be an important geographical context, indicating the possibility that this study will focus on stunting prevention efforts in Indonesia.

Graph 3.
Clusters by Documents Coupling

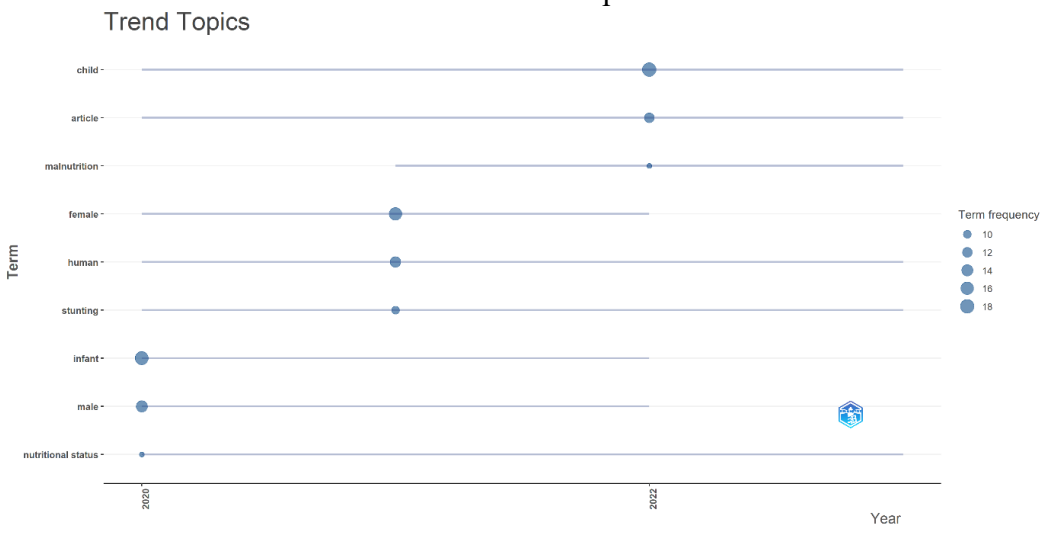


Based on the results of the "Clusters by Documents Coupling" analysis in the study related to "Nutrition Counseling and Stunting Prevention in Toddlers," it was found that clusters discussing children (27.8%), women (31.2%), and infants (29.4%) had high impact and centrality, indicating that this topic is the centre of influential discussion in the literature related to stunting. On the other hand, clusters covering children (44.4%), infants (41.2%), and malnutrition (66.7%) had lower impact and centrality, so although relevant, this topic has not become the main focus of scientific discussions. In addition, clusters discussing women (43.8%), men (50%), and articles (41.7%) had high centrality but relatively lower impact, indicating that this topic often appears in research but has not had a major influence on the development of literature. Overall, the topics of children, women, and infants dominate in influence and central role in research on stunting prevention and nutritional counseling.

Graph 4.
Research topics

The results of this study show that most topics discussed were related to children (6%) and infants (6%), which were the main focus of the study. Gender issues were also noted, with women and men appearing at 5% each. In addition, health issues such as malnutrition, nutritional status, and stunting appeared significantly (3% each), along with topics related to weight and underweight (1%). The study involved many clinical studies, such as large clinical studies (3%), controlled studies (2%), cross-sectional studies and randomized controlled trials (2% and 1% respectively). The study also included cross-country studies, especially in developing countries such as Bangladesh, Somalia, Ethiopia, Peru, and Malawi. In addition, concerns about food security (1%) and rural populations (1%) were also part of the study. Maternal nutrition and breastfeeding behaviour (2%) were important focuses, highlighting factors influencing overall human health and nutrition.

Graph 5.
Trend Topics



The graph shows the trend of research topics from 2020 to 2023, where the frequency of use of certain terms varies. Terms such as "child" and "infant" experienced a significant increase in 2023, while terms such as "female", "human", and "stunting" also had significant occurrences in the same period. The term "malnutrition" showed a stable frequency throughout the period from 2020 to 2023, indicating consistent attention to the issue of malnutrition. Although "male" and "nutritional status" appeared less frequently, they remained relevant to the research topics. These differences in frequency reflect how some health topics have received greater attention over time, possibly due to changes in research foc s or increased concern for specific populations, such as children and women.

Table 3.
Article Analysis

Name	Method	Interventions	Subjects	Location	Obstacles	Implication	Limitations
(Nadimin et al., 2021)	Randomized pretest-posttest control	Virtual Nutrition Counseling	Mother with stunted toddler child in South Sulawesi	South Sulawesi, intervention for 1 month	Some results were insignificant, such as increased height and nutritional knowledge.	Tibus snacks and virtual nutrition counseling increase maternal nutrition growth and knowledge	Height gain and maternal nutrition knowledge showed no significant difference between groups
(Christian et al., 2020)	Quasi-experimental	IYCF lipid nutrition supplement and education	Children aged 6-23 months, n = 2404 (baseline), n = 2453 (endline).	Rural Malawi.	There was no significant change in stunting.	Programs improve weight, health, and maternal practices but do not reduce stunting.	There is no impact on anaemia and stunting.
(Elba et al., 2024)	Quasi-experimental, two-group pretest-posttest	Nutrition counseling and protein intake measurement	124 mothers of stunted toddlers,	Batujajar and Cihampelas, West Bandung.	No specific barriers were mentioned in the study	Counseling boosts maternal nutrition knowledge, toddler protein intake, and health education.	Not explained in detail.
(Nyamasege et al., 2021)	Follow-up of a randomized controlled trial in a group	Monthly nutrition education and counseling	1004 mother-child pairs, with 438 couples	A slum in Nairobi, Kenya.	Loss of participants due to drop out during the study	Home interventions are effective in reducing the prevalence of stunting.	Loss of participants in the long-term
(Darawati et al., 2020)	Quasi-experimental design.	Participatory counseling	66 people, consisting	Central Lombok Regency,	challenges in receiving	This intervention has the	Facing the problem of generalizing

Name	Method	Interventions	Subjects	Location	Obstacles	Implication	Limitations
			of 33 people in the control and experiment groups	West Nusa Tenggara.	intervention or community involvement.	potential to be an alternative to prevent stunting in children under five years old	results and controlling external variables.
(Eshete Tadesse et al., 2020)	Community-based case-control studies.	Focus on identifying intervention priorities.	321 (107 cases, 214 controls).	Kemissie City Administration, Ethiopia.	It is not mentioned, but it can include data limitations.	Interventions for maternal nutrition, breastfeeding, and diarrhoea to reduce stunting.	Unexplained, but memory bias may be an issue.
(Eshete Tadesse et al., 2020)	Community-based individual control case studies.	Identifying Intervention Priorities for Stunting Prevention	321 (107 cases and 214 controls).	Administration of the city of Kemissie, eastern Ethiopia, lau	limitations in data collection	Focus interventions on maternal nutrition, exclusive breastfeeding, food priorities, and diarrhoea prevention to address stunting.	It is not explicitly explained, but memory bias and difficulties in assessing cause-and-effect relationships can be an issue.
(Ali et al., 2022)	Quasi-experimental design.	Nutrition counseling (NC) and a combination of nutrition counseling	255 caregivers, with 184 children aged 6 to 59 months	Two districts in the Banadir region of Somalia.	Acceptance of the intervention or local culture may affect the outcome.	The intervention did not show a significant impact on child growth or food safety	so further evaluation is needed to identify factors that may affect the effectiveness of the intervention.
(Mbabazi et al., 2024)	Cross-sectional studies.	Focus on the correlation analysis of factors that affect child development	750 children aged 12–59 months who are stunted	Uganda	Malnutrition, malaria infection, and lack of stimulation hinder child development.	Stunting rates, head circumference, and household income positively correlate with child development.	The need for further analysis of the factors contributing to the development of stunted children
(Rousham et al., 2023)	Participatory design with workshops.	Development of prototypes to address malnutrition.	Involving a babysitter, an unspecified amount	Lima and Huánuco, Peru	It is not explicitly mentioned.	Findings will guide malnutrition interventions and	It's unexplained, but the potential for generalization is limited.

Name	Method	Interventions	Subjects	Location	Obstacles	Implication	Limitations
						inform stakeholders.	
(Goudet et al., 2019)	A systematic review of previous studies	Nutrition supplements, education, and system strengthening	A total of 9,261 children and 3,664 pregnant women from 15 studies	Slums in Bangladesh, India, and Peru.	High mobility, lack of social services, and loss of follow-up rates in slum settings	Interventions in slums require a multisectoral approach and more evidence.	High risk of bias in most studies and a lack of reporting of differential impacts on equality issues
(Astuti et al., 2024)	Cross-sectional.	Education on feeding practices	706 children (352 stunted, 354 not stunted).	Karanganyar, Central Java, Indonesia.	False cultural beliefs regarding feeding.	The importance of education for mothers and counseling at the Health Center.	Not mentioned, but culture can influence outcomes.
(Yusriadi et al., 2024)	Observation, group discussions, and interviews (10, 45, 23).	Stunting prevention through dietary support and counseling.	Households, village officials, health providers.	Rural areas of Indonesia.	Negative social behaviours and lack of understanding of nutrition	Community education and logistical support are needed.	Supply chain issues and training of healthcare workers
(Mistry et al., 2019)	Cross-latitude survey	Nutrition counseling for mothers.	3009 mother-child (1557 interventions, 1452 controls).	114 sub-districts in Bangladesh.	It was not specifically mentioned.	Effectively reduce stunting and improve feeding practices.	Not explained in the abstract.
(Sumiaty et al., 2021)	Descriptive with an exploratory approach.	Midwives and organizations play a key role in reducing stunting.	288 midwives.	Central Sulawesi, Indonesia.	Improve stunting prevention, post-natal care, and early breastfeeding.	Midwives support health education, family planning, and breastfeeding to prevent stunting	It is not specifically explained in the abstract.
(Nasution et al., 2023)	Quasi-experimental.	Counseling and provision of premix cookies	Total: 52 mothers with children aged 1-2 years.	It is not specifically mentioned in the abstract.	It is not specifically explained in the abstract.	Premix cookies are effective in increasing	It is not specifically explained in the abstract.

Name	Method	Interventions	Subjects	Location	Obstacles	Implication	Limitations
						children's weight and good nutritional status.	

Effectiveness of Nutrition Counseling in Preventing Stunting

As revealed in several studies, nutrition counseling has shown varying degrees of effectiveness in preventing stunting. Nadimin et al. (2021) found that virtual nutrition counseling did not significantly improve height and nutritional knowledge, although there was an increase in child growth. In addition, Christian et al. (2020) showed that the lipid nutritional supplement and IYCF education program did not reduce the prevalence of stunting. However, it was successful in increasing child weight and health. Another study by Elba et al. (2024) noted that nutrition counseling successfully increased maternal knowledge and protein intake in toddlers, but its impact on stunting was not explained in detail.

On the other hand, Nyamasege et al. (2021) indicated that nutrition education and counseling effectively reduced the prevalence of stunting. However, further research is needed on its long-term effects. Darawati et al. (2020) also emphasized the potential of participatory nutrition counseling as an alternative for preventing stunting in local communities. Finally, Nasution et al. (2023) reported that using premix cookies effectively increased the weight and nutritional status of children aged 1-2 years. From this comparison, it can be concluded that although some nutrition counseling programs successfully improve knowledge and nutritional status, their impact on stunting varies and is often insignificant.

Supporting Factors and Barriers to Nutrition Counseling

Several factors, including maternal knowledge, family support, and access to health services influence the success of nutrition counseling interventions. The level of knowledge mothers have about nutrition greatly influences their decisions to provide food and supplements. In addition, support from the family in implementing good nutrition practices is key to the success of the intervention. Access to health services and nutrition counseling also play an important role in the program's effectiveness. However, several barriers are encountered in implementing nutrition counseling programs, especially in areas with limited resources. Limited resources in rural areas often result in a lack of health facilities and trained health workers. As Nyamasege et al. (2021) reported, loss of participants during the study can affect long-term outcomes. In addition, cultural beliefs about feeding practices can also hinder the effectiveness of nutrition counseling, as revealed in the study by Astuti et al. (2024). Considering these factors, it is important to develop a more holistic and integrated strategy to improve the effectiveness of nutritional counseling in preventing stunting.

Stunting is a significant nutritional problem worldwide, especially in developing countries, characterized by children's height being lower than the standard set for their age (De Sanctis et al., 2021). This condition is often caused by chronic malnutrition due to lack of adequate nutrient intake during critical growth periods and social, economic, and environmental factors. Stunting not only affects children's physical health but can also negatively impact cognitive development and learning abilities, thus affecting their quality of life in the future (Beal et al., 2018). According to the World Health

Organization (WHO), stunting affects around 149 million children worldwide, making it a public health challenge that must be addressed seriously (Siswati et al., 2022). Preventing stunting requires a comprehensive approach involving nutritional interventions, health education, and improving socio-economic conditions to create an environment that supports optimal child growth and development (Muhammad R. D. Mustakim et al., 2022).

Nutrition counseling is important in preventing stunting in toddlers, which is one of the global public health challenges (Khairani et al., 2023). Stunting, characterized by a height lower than the standard for age, can negatively affect children's physical growth and cognitive development. Nutrition counseling increases parental awareness and knowledge regarding healthy feeding practices and the importance of balanced nutritional intake (Fitri & Fitria, 2023). In this context, a counseling-based approach is expected to support families in creating an environment that supports good eating patterns, which can reduce the risk of stunting in their children.

The results of the bibliometric analysis indicate that nutritional counseling has significant potential to prevent stunting in toddlers, although its effectiveness varies across studies. Several studies, such as those conducted by Nadimin et al. (2021) and Christian et al. (2020), indicate that although nutritional counseling does not directly reduce the prevalence of stunting, this intervention can improve nutritional knowledge and child growth. This finding aligns with previous literature stating that a counseling-based approach can increase parental awareness of healthy feeding practices, thus potentially preventing stunting. However, the results showing the lack of direct impact on stunting indicate the need for a more comprehensive approach that focuses on counselling and includes broader social and economic factors. Overall, this study contributes to the understanding that nutritional counseling can be important in stunting prevention strategies but must be integrated with other interventions to achieve more optimal results.

The implications of the results of this study are very important for public health policies, especially in the development of stunting prevention programs through nutritional counseling interventions. Based on the findings showing that family support and maternal knowledge play a crucial role in the success of nutritional counseling, recommendations can be directed at increasing family involvement in these programs. Health policies should include education that targets mothers and other family members to create an environment that supports good nutrition practices. In addition, improving access to health services in rural areas is key to ensuring that every family can benefit from nutrition counseling programs. Recommendations for improving nutrition counseling programs at various levels, including community, clinic, and national, should emphasize the importance of cross-sectoral involvement, including education, social, and economic, to holistically address the causes of stunting.

Although this study provides valuable insights, several limitations need to be noted. The Systematic Literature Review (SLR) method has limitations, such as the limited number of studies in certain areas and the variation in the quality of the studies reviewed. This study may affect the generalizability of the findings and recommendations produced. In addition, the period reviewed, from 2019 to 2024, may not include all relevant earlier studies, thus affecting a comprehensive understanding of the effectiveness of nutrition counseling. Therefore, suggestions for further research include the need for more comprehensive and inclusive longitudinal studies and a deeper analysis of the long-term impact of nutrition counseling interventions on stunting across cultural and social

contexts. Further research should also consider more appropriate measurement methods to evaluate the effectiveness of nutrition counseling interventions in different contexts.

CONCLUSION

This study suggests that nutritional counseling is important in preventing stunting in children under five, although its effectiveness varies across studies. Nutrition counseling can improve maternal knowledge and healthy feeding practices, but its impact on reducing stunting prevalence is often insignificant. Factors such as family support and access to health services also play key roles in the success of this intervention. Although it does not always result in direct changes in children under five's height or nutritional status, effective counseling can increase parental awareness and improve nutritional practices, ultimately contributing to children's health and growth. Therefore, nutrition counseling should be integrated into a more holistic approach to addressing stunting. Policymakers should consider developing stunting prevention programs that involve nutrition counseling as part of a cross-sectoral approach encompassing education, health, and social support. Policies should support increased access to health services, especially in rural areas. Health practitioners are advised to involve families in the nutrition counseling and education process and provide easily accessible and practical information to improve the implementation of good nutrition practices at home. In addition, researchers need to conduct further studies that include a longitudinal approach and deeper contextual analysis of the effectiveness of nutrition counseling in preventing stunting, as well as involving social, cultural, and economic factors to better understand the dynamics that contribute to stunting in different populations.

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