

REVIEW ARTICLE

Policy, intervention, and management in addressing stunting in children: A systematic review

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Abstract

Stunting is a chronic malnutrition problem caused by a lack of nutrients over a long period. This leads to problems later in life, resulting in difficulty in achieving optimal physical and cognitive development. This study analyzes policies, interventions, and addresses of child stunting in Asian, African, and American countries through a systematic review. The design used is a systematic review, articles are collected using electronic databases such as ScienceDirect, SpringerLink, ProQuest, PubMed, and SAGE from 2019-2023 using the keywords policy, management, and stunting. As the results of the literature review to reduce stunting rates, stunting policies and programs focus on food security, decentralization of the health system, availability of health services and access to health services, maternal education, access to water, hygiene, sanitation, maternal nutrition, and poverty alleviation—appropriate policy implementation results of holistic and comprehensive policy formulation. Stunting prevention requires cross-program and cross-sector collaboration and is carried out comprehensively. (*Afr J Reprod Health* 2024; 28 [10s]: 348-357).

Keywords: Policy; intervention; management; stunting

Résumé

Le retard de croissance est un problème de malnutrition chronique causé par un manque de nutriments sur une longue période. Cela entraîne des problèmes plus tard dans la vie, ce qui entraîne des difficultés à atteindre un développement physique et cognitif optimal. Cette étude analyse les politiques, les interventions et les réponses au retard de croissance chez les enfants dans les pays asiatiques, africains et américains au moyen d'une revue systématique. La conception utilisée est une revue systématique, les articles sont collectés à l'aide de bases de données électroniques telles que ScienceDirect, SpringerLink, ProQuest, PubMed et SAGE de 2019 à 2023 en utilisant les mots-clés politique, gestion et retard de croissance. Comme les résultats de l'examen de la littérature pour réduire les taux de retard de croissance, les politiques et programmes de retard de croissance se concentrent sur la sécurité alimentaire, la décentralisation du système de santé, la disponibilité des services de santé et l'accès aux services de santé, l'éducation maternelle, l'accès à l'eau, l'hygiène, l'assainissement, la nutrition maternelle et la réduction de la pauvreté - la mise en œuvre appropriée des politiques résulte d'une formulation de politiques holistiques et complètes. La prévention du retard de croissance nécessite une collaboration interprogrammes et intersectorielle et est réalisée de manière globale. (*Afr J Reprod Health* 2024; 28 [10s]: 348-357).

Mots-clés: Politique; intervention; gestion; retard de croissance

Introduction

Stunting is a problem of nutritional throughout the world, especially in poor and developing countries¹. Stunting is a form of developmental delay caused by accumulated malnutrition that lasts for a long time from pregnancy to the age of 24 months^{2,3}. Stunting in children is the result of malnutrition in the first 1,000 days of life. This can cause permanent damage to the child's physical development, resulting in reduced cognitive and motor skills and reduced work performance.

The average *Intelligence Quotient* (IQ) of stunted children is eleven points lower than the average IQ of normal children⁴. If not treated early, growth and development impairment caused by malnutrition can persist into adulthood⁴. Stunting is a nutritional status characterized by stunted growth, based on anthropometric parameters of height, namely Body Height according to Age or Body Length according to Age. Thresholds (Z-scores) for measurements are < -2 SD to -3 SD (stunted) and < -3 SD (severely stunted)⁴. Globally, the world's stunting share is relatively

high at 24%, where the highest are Papua New Guinea and Timor Leste (50% each), followed by Pakistan (45%), Mozambique (43%), Zambia (40%), India (39%), Nepal (37%), Indonesia (36%), Myanmar (35%). The United Republic of Tanzania (36%), and based on contiguous coverage, South Asia ranks as the highest stunting presentation in the world at 37%, followed by sub-Saharan Africa (36%), eastern and southern Africa (36%), western and central Africa (35%), and East Asia and the Pacific (11%). The lowest are Latin America, the Caribbean, and the Russian Federation (10%)⁵. The global prevalence of stunting in children under five is 141.3 million, and in 2025 WHO predicts the incidence of stunting in children under five is 128.3 million. It will decrease to 116.5 million by 2023⁶. Despite the decline, this number is still the largest number of cases globally, so efforts to prevent and minimize stunting must still be optimized because this cannot be separated from the short-term and long-term impact of stunting. Short-term consequences are impaired brain development, cognitive development, impaired physical growth, and metabolic disorders in the body. Long-term consequences are decreased cognitive ability and learning achievement, a low immune system so that children are susceptible to disease, a high risk of developing diabetes, obesity, impaired heart and blood vessel function, cancer, stroke, and disability in the old phrase⁷.

Handling stunting requires coordination across programs and sectors and involving various stakeholders, namely the government, the business world, the community, and others. Mitigation efforts are carried out by the government through specific interventions, carried out by the Ministry of Health, Provincial Offices, and Districts/Cities, and sensitive interventions related to environmental health, poverty reduction, and women's empowerment⁸. Commitment and policies from the government are needed to ensure the success of stunting-free regions. This commitment and policy are certainly built from the central, and regional leaders to the leaders of the smallest units in the community. This study aims to analyze policies, interventions, and management of handling stunting in children through a systematic review. while the question in this study is how policies, interventions, and management in dealing with stunting in children through a systematic review.

Methods

This review was conceptualized and conducted by the Preferred Reporting Items for Systematic Review and PRISMA Meta-Analysis statements⁹. Criteria methods, screening, inclusion, and exclusion analysis are developed following the above protocol.

Inclusion and exclusion criteria

We reviewed peer-reviewed journal articles on policies, interventions, and management addressing child stunting in various countries. In writing this article, to obtain the latest literature, literature searches in the last 5 years, namely from 2019 to 2023, were published in English and are eligible for review.

Search strategy and study identification

A comprehensive search was conducted to identify relevant literature on this subject from 2019 to 2023 which included searching national and international literature using ScienceDirect, SpringerLink, ProQuest, and PubMed databases using the keywords policy, intervention, management, and stunting.

Data collection, extraction, and assessment tools

Data extraction spreadsheets are created using Microsoft Excel to systematically record all relevant studies. An initial account was created at EBSCO Host and Web of Science, to be temporarily stored during the search process and subsequently transferred to the RefWorks reference manager. All relevant studies are then exported to Microsoft Word. The data extraction titles included are author name, year of publication, research location, research intent and objectives, research design, and findings. Lead reviewers sift through each title, extract data, and rate the quality of all included studies. A second reviewer then checks the extracted sheet and inconsistencies are resolved in consultation with the third author.

Data and thematic analysis

The findings of the review are synthesized thematically. This is due to the varied nature of

primary studies making it difficult for meta-analysis. Themes are developed following six phases of thematic analysis¹⁰. This is first done by actively reading each article to understand the content of each paper, followed by assigning the initial code to the relevant article features. Similar codes are grouped to form a theme. The themes were checked for accuracy, and finally, four themes were obtained.

Results

the first stage of the journal article search, 1,228 articles were obtained through database search. The PRISMA flow chart in Figure 1 provides details of the selection process. Of these, only 16 articles were found to be relevant. 9 studies were conducted in Asia, 4 in Africa, 1 in the Americas, and 2 in Asia, Africa, and the Americas. Table 1 summarizes the papers included in the review with the author's name, country, methods, and research results. The results of the review show that policies, interventions, and management in addressing stunting in children include providing essential nutrition, counseling parents on child feeding priorities, encouraging optimal breastfeeding duration, and preventing diarrhea in children aged 6–59 months²⁷. 21.58% of stunting in children under 5 years old in rural areas can be prevented through better access to drinking water sources and better household waste disposal^{17,21} to prevent the recurrence of infection¹². Increase multisectoral nutrition collaboration to strengthen local governance and implementation to improve child nutrition^{13,18}. Key policies and programs to reduce stunting focus on improving rural agriculture to improve food security^{14–16} the role of parents in determining nutritional adequacy¹⁵, decentralization of health systems¹⁷, increasing rural access to health services²¹ and reducing open defecation, multi-sector poverty alleviation strategies^{14–17,19,21,25}, and committed to developing girls' education^{14,17}.

Implementation of specific and sensitive nutrition policies²⁴ and programs related to the promotion of breastfeeding, social protection schemes, and land and sectoral reform¹⁶. Peru can reduce child stunting by improving socioeconomic factors, implementing sustainable change within and outside the health sector, and implementing health interventions¹⁹. These efforts rely on multi-

sectoral approaches, strong civil society support, and affirmative political leadership¹⁹. Daily administration of lipid-based micronutrient supplements started ≥ 3 months before conception showed benefits for fetal growth and improved female nutrition²⁰. Senegal's achievements in reducing stunting are largely due to the government's nutrition priorities, the country's political stability, and the implementation of nutrition efforts using a multi-sectoral approach, the availability of better maternal health and education services, access to water and sanitation, and poverty alleviation²¹. Additional efforts in the health, water, sanitation, and land sectors will contribute to sustainable success²¹.

Some countries have significantly reduced the prevalence of stunting in children, with or without closing geographical, economic, and other population disparities²⁸. The country is progressing through interventions from inside and outside the health sector. Improved maternal education^{21,28}, maternal nutrition, maternal and newborn care, and reduced fertility/decreased spacing between pregnancies are strong contributors to change²⁸. The roadmap for a massive reduction in child stunting contains several stages related to diagnosis, stakeholder consultation, and implementation of direct and indirect nutrition interventions related to the health and non-health sectors²⁸. Parenting serves to improve stunting handling²³. An increase in specific nutrition assistance per capita of one dollar was associated with a decrease in the proportion of stunted children and nutrition assistance successfully reduced the proportion of stunted children²⁶. The findings in this study are in line with previous evidence that to reduce the incidence of stunting, efforts to prevent stunting in children must include efforts to strengthen the provision of essential nutrients, provide education to parents about food priorities in children, and provide encouragement. optimal duration of breastfeeding and prevention of diarrheal diseases in children aged 6–59 months²⁷.

Convergence measures as the main strategy in the stunting reduction program require attention at the level of operational. Front guard leaders in the region, as holders and agents of political and bureaucratic specialists in the regions, must be able to ensure that the key policies are implemented in the institutions closest to their communities. If there is a lawful and formal order, the district government

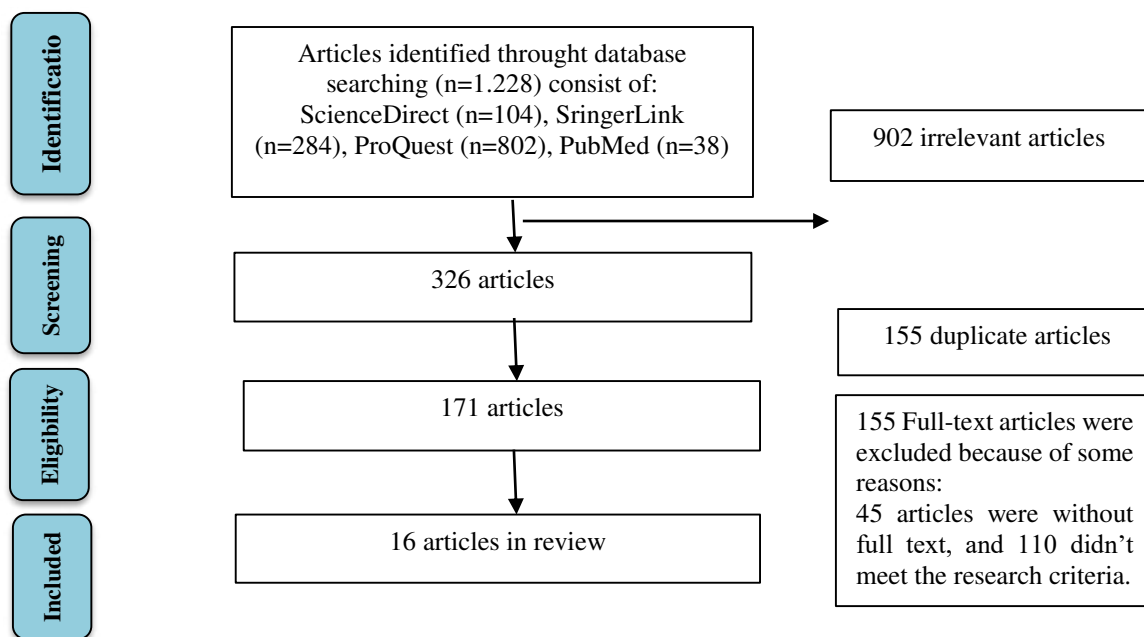


Figure 1: Database search diagram based on PRISMA guidelines

Table 1: Summary of selected studies

Authors	Country	Methods	Results
Tadesse, S.E., et al (2020)	Northeastern Ethiopia	Case-control study w	Intervention measures to prevent stunting in children must include strengthening actions to provide essential nutrients, counseling parents about child feeding priorities, promoting optimal duration of breastfeeding, and preventing diarrheal in children aged 6–59 months ¹¹ .
Irianti, S., et al (2019)	Indonesia	Regresi logistik multivariabel	Household wealth protects the risk of stunting. The analysis of PAF shows that 21.58% of stunting in children under 5 years old in rural areas could be prevented through better access to drinking water sources and better disposal of household waste to prevent recurrence of infections ¹² .
Klemm, Gina C., et al (2022)	Tanzania	Descriptive–Analytical	Four regions successfully established action groups bridged the communication gap between administrators and implementers, achieved progress in nutrition advocacy, collaboration, and budgeting, and launched multisectoral nutrition implementation in the community. Improve multisectoral nutrition collaboration. Findings provided by officials to local and regional leaders support the importance of Multi-Sector Nutrition Action Teams as a viable and acceptable approach to strengthening local governance and implementation to increase child nutrition ¹³ .
Tasic, Hana., et al (2020)	Ethiopia	mixed methods	Key policies and programs to reduce stunting focus on promoting rural agriculture to increase food security; decentralize the health system, involving health education workers to increase rural areas' access to health services and reduce open defecation; multi-

Hidayat, B.A., Erlyn, P (2021)	Indonesia	Mixed methods	sector poverty reduction strategy; and commit to developing girls education ¹⁴ . The strategy to accelerate the reduction of stunting is that family food security and parenthood determine nutritional adequacy and are enhanced by the coordination of poverty reduction programs, specifically the New Entrepreneur Growth Program and the Empowerment of Small and Micro Enterprises ¹⁵ .
Wigle, J. M., et al (2020)	Kyrgyz Republic	Mixed methods	Poverty alleviation, increased migration and remittances, food security, and maternal nutrition are the main drivers in reducing stunting. Land reform and improved food security are important factors. Specific and sensitive nutrition policies and programs are implemented related to breastfeeding promotion, social protection schemes, and land and sectoral reforms ¹⁶ .
Conway, K., et al. (2020)	Nepal	Mixed methods	Key initiatives focus on decentralizing the health system and mobilizing community health workers to improve accessibility; providing longstanding primary health interventions nationwide; Targeted efforts to advance maternal and child health; and prioritizing nutrition-sensitive initiatives from governments and donors. Stakeholders at the national and community levels as well as mothers at the village level emphasized access to health services, a combination of poverty alleviation, increased education and improved access to water sanitation and hygiene are factors that help reduce stunting ¹⁷ .
Naila, N.N., et al (2021)	Bangladesh	Methods A longitudinal prospective intervention study	Stunted children received nutritional interventions: one boiled egg and 150 ml of milk every day for 3 months, psychosocial stimulation including structured play activities, and parental counseling for 6 months as well as routine clinical care. Results During the nutrition intervention period, the average appetite score increased from 49 to 60 in stunted children and was associated with enhanced food consumption ¹⁸ .
Huicho, L., et al (2020)	Peru	Mixed methods	Peru can reduce child stunting by improving socio-economic factors, implementing sustainable changes within and outside the health sector, and implementing health intervention. These efforts rely on a multi-sectoral approach, strong civil society support, and affirmative political leadership ¹⁹ .
Shaded, S.M., et al. (2020)	South Asia	Secondary analysis	Daily lipid-based micronutrient supplements began ≥ 3 months before conception. Point estimates of continuous and binary anthropometric outcomes were consistently better when maternal nutritional supplementation was started ≥ 3 months before conception, showing benefits for fetal growth and improved nutrition in women in this population ²⁰ .
Brar, S., et al. (2020)	Senegal	Mixed methods	Senegal's achievements in reducing stunting are largely due to the government's nutrition priorities, the country's political stability, and implementation of nutrition efforts using a multi-sectoral approach, the availability of improved maternal health and education services, access to water and sanitation, and poverty alleviation. Additional efforts in the health, water,

Bhutta, Z.A., et al. (2020)	Nepal, Ethiopia, Peru, Kyrgyz Republic, Senegal.	Mixed methods	sanitation, and land sectors will contribute to continued success ²¹ . Some countries have significantly reduced the prevalence of stunting in children, with or without closing geographic, economic, and other population gaps. The country is making progress through intervention from within and outside the health sector. Improved, maternal education, maternal nutrition maternal and newborn care, and reduced fertility/decreased interval between pregnancies are strong contributors to change. The road map for reducing stunting in children on a large scale contains some stages correlated to diagnostics, the consultations of stakeholders, and the implementation of direct and indirect nutritional interventions correlated to the health and non-health sectors ²² .
Putri, A.P., Rong, Jin-Ru (2021)	Indonesia	Walker and Avant's method of concept analysis	Parenting serves to improve stunting management. The characteristics of the nurturing function are knowledge, competence, effort, partnership, responsibility, caring, communicating, and teaching. The antecedents to parenting functions are relationships, characteristics of children, careful observation, and vicarious experience. The consequences are positive parenting practices, reduced psychological stress, and child health ²³ .
Sunjaya, D.K, Herawati, D.M.D (2022).	Indonesia	Mixed methods	Comparative analysis of cross-district activity locations is applied between subdistricts and villages. The results of the implementation of various convergence action policies have been implemented well at the district levels, in line with adequate regulations, controls, and budgets from the central government. Meanwhile, at the subdistrict and village level, they only carry out aspects of acceptability, suitability, and coverage of certain interventions ²⁴ .
Essa, W.Y., et al (2021).	Indonesia	Mixed methods	This research recommendation focuses on the areas of development planning, increasing community participation, and multistakeholder cooperation through strengthening innovation, collaboration, and innovation ²⁵ .
Khalid, H., et al. (2019)	Guatemala, Chad, Burkina Faso, Côte d'Ivoire, Ghana, Nigeria, Cameroon, Congo, Angola, Zambia, South Africa, Mozambique, Malawi, Madagascar, Tanzania, Kenya, Mali, Niger, Sudan, Rwanda, Uganda, Ethiopia, Yemen, Egypt, Iraq, Afghanistan, Pakistan, India, Nepal, Bangladesh, Myanmar, Vietnam, Indonesia and the Philippines	fixed-effects regressions	An increase in specific nutrition assistance per capita by one dollar is associated with a decrease in the proportion of children experiencing stunting and nutrition assistance has successfully decreased the proportion of stunted children ²⁶ .

will accept the principal²⁹⁻³¹. Stunting prevention and control have many obstacles and challenges, for example, program ineffectiveness, utilization of resources, and inefficient allocation³². Efforts to prevent and overcome stunting will not be successful if they rely solely on individuals or one sector. Success in reducing stunting can be achieved faster if integration and convergence measures are implemented at central, regional, and village levels³³. Clear resourcing, leadership, and governance responsibilities across all sectors of specific and sensitive nutrition interventions have great potential to support accelerated reductions in stunting²². The strategies developed will be implemented through cross-sector cooperation and coordination at the central and regional levels, as well as by providing sustainable food, water, health, and nutrition³⁴. Multi-sector action plans at different levels have been proven to be able to reduce stunting^{22,35,36}.

The empowerment of women, poverty alleviation, programs of public health that focus on water, sanitation, and hygiene (WASH), as well as increasing acceptance, coverage, and quality of maternal and child health services, are some of the interventions that can advance children's growth³⁷. In most food shortage areas and among households with higher levels of stunting, this strategy needs to be replicated to increase nutrition and health. By addressing multiple interrelated factors in middle- and low-income countries, the One Health strategy represents a new approach to addressing child stunting, where coordinated intervention across human, animal, and environmental health factors can help reduce developmental delays and create synergistic effects³⁸. To close achievement gaps, strengthening strategies to reduce malnutrition in vulnerable areas must be prioritized³⁹.

Governments and policymakers need to take long-term remedy several social and environmental problems associated with chronic malnutrition, with a focus on urban slums⁴⁰. Decision-making and practice can be improved through a variety of interventions, including policy dialogue⁴¹. There is a policy framework to address stunting during childhood, focusing on clearly defined requirements for developmental delays in adolescents and older children to simplify monitoring activities^{42,43}. The interventions of cultural communication can assist stop stunting by inviting religious leaders to speak about nutrition in

the pulpits and during religious events. Through this method, people will understand how to stop the lack of nutrition and how to prevent it⁴⁴. Relevant organizations are required to prioritize addressing the problem of stunting by promoting girls' education, increasing household economic situations, improving mothers' education, promoting contextual child-feeding practices, and increasing maternal nutrition education, counseling, sanitation, and hygiene practices²⁷. Steps need to be taken to accelerate the process of reducing stunting by leveraging the potential and benefits and aligning centrally initiated initiatives with national performance. Participate in and integrate co-production into existing health and nutrition policy frameworks⁴⁵. To increase speed a more equitable reduction of stunting, health, and food systems initiatives also need to be coordinated³⁴.

Discussion

Future policies and programs on reducing stunting prevalence at the national level for each country vary, but there are a set of key determinants that determine they must be addressed with policy changes and programmatic actions to encourage further progress in reducing stunting, optimizing child growth and development, ultimately achieving health and nutrition goals²⁸. The opportunities and ambitions of efforts to scale up action in high-burden countries must be balanced with financing needs, as assessed by the World Bank, and optimize available resources (Optima Nutrition)²⁸. Case studies in other countries on key drivers of improved nutrition, such as "Stories of Nutritional Change"⁴⁶ and "Stop stunting South Asia"⁴⁷, have highlighted the importance of strong leadership, political and institutional commitment, and strategic investments that target the most vulnerable groups and address the biggest risk factors for child growth. The findings support and agree on the importance of this for sustaining improvements in child malnutrition, also emphasizing the importance of multisectoral action plans to target malnutrition, although the importance of the sector varies by context²⁸. Improving Nutrition provides a collaborative and multisectoral framework for governments to commit to ending all forms of malnutrition⁴⁸. WHO has also compiled a list of evidence-based Essential Nutrition Measures⁴⁹ that can be used by countries to address the determinants of malnutrition, taking

into account, taking into account the local context and progress towards achieving global nutrition targets. By the end of the nutrition decade, an acceleration of activities in nutrition programs is urgently needed for countries to achieve the targets set by the WHA and the SDGs⁵⁰. The suggested action offers a pragmatic approach, an evidence-based approach to doing so⁵⁰.

Conclusions

This systematic review provides evidence-based information on policies, interventions, and management to address child stunting that will help to reduce and prevent future stunting. Stunting mitigation requires cross-program and cross-sector and is implemented comprehensively. Existing policies and regulations at the central level need to be followed up with monitoring at the village level and involve not only the health sector but also other related sectors. Community-based management systems need to be improved because strong public awareness of the importance of balanced nutrition, hygiene, and sanitation is the main key to reducing stunting.

Ethical approval

This article does not involve any studies with human participants or animals performed by any of the author.

Conflict of Interest

The authors have declared no conflict of interest.

Contribution of authors

Siti Aminah: conceptualized, designed research, collected, and analyzed data. Trias Mahmudiono: reviewing empirical studies, designing methodology. Siti Rahayu Nadhiroh: wrote the introduction and edited the paper.

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