Review

What Factors Drive Childhood Stunting? Examining Child Health Risks, Maternal and Early-Life Determinants, Nutrition, and Socioeconomic Influences

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ARTICLE INFO

Article History

Submit : October 25, 2025
Accepted : March 26, 2026
Published : March 30, 2026

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Citation:

Barkah, A. ., Usep, U., Sony, U. ., Nugraha, D. ., Amin, K. F. ., Lestari, V. ., & Fauzi, A. . (2026). What Factors Drive Childhood Stunting? Examining Child Health Risks, Maternal and Early-Life Determinants, Nutrition, and Socioeconomic Influences. Journal of Applied Nursing and Health, 8(1), 650–662. https://doi.org/10.55018/janh.v8i1.610

ABSTRACT

Background: Childhood stunting remains a major global public health challenge driven by complex interactions among child health risks, nutritional status, maternal and early-life determinants, and socioeconomic conditions. Although the literature on stunting has expanded substantially, a comprehensive bibliometric mapping focusing on immunization, nutrition, and maternal determinants remains limited. This study aimed to map global research trends, thematic structures, and collaboration networks related to childhood stunting determinants.

Methods: This study employed a bibliometric analysis of Scopus-indexed publications. Data were retrieved from the Scopus database in January 2026 using search terms related to childhood stunting, immunization, nutrition, and maternal factors. Eligible documents included journal articles and review articles published between 2010 and 2026 in English. After screening and data cleaning, 323 documents were included for analysis. Bibliometric indicators were analyzed using VOSviewer version 1.6.20, including publication trends, keyword co-occurrence, co-authorship networks, and thematic clustering.

Results: The findings showed a growing volume of publications on childhood stunting determinants over time, indicating increasing global scholarly attention. Keyword co-occurrence analysis identified four major thematic clusters: child health risk factors, maternal and early-life determinants, socioeconomic influences, and nutritional status and malnutrition. The term “stunting” emerged as the central keyword with strong links to child health, maternal nutrition, breastfeeding, poverty, and sanitation. The results indicate that stunting research has evolved into an interdisciplinary field integrating biological, maternal, environmental, and structural perspectives.

Conclusion: Research on childhood stunting has developed within an increasingly multidimensional and collaborative scientific landscape. Bibliometric mapping highlights the need for integrated research and policy strategies that connect maternal care, nutrition interventions, immunization services, and socioeconomic support. Future studies should strengthen cross-country collaboration, expand interdisciplinary approaches, and address research gaps in low- and middle-income settings.

Keywords: Stunting; Child Nutrition; Maternal Health; Immunization Coverage; Bibliometric Analysis

Implications for Practice:

- Integrated maternal nutrition, immunization coverage, and early child health interventions should be prioritized to reduce childhood stunting.
- Health systems in low- and middle-income countries should strengthen multisectoral coordination linking maternal care, child nutrition services, sanitation, and vaccination programs.
- Bibliometric evidence can guide policymakers and public health practitioners in identifying priority themes, research gaps, and collaborative strategies for more effective stunting reduction programs

Introduction

Childhood stunting remains one of the most critical global public health challenges and continues to receive significant attention from international health organizations and policymakers. Stunting is defined as impaired linear growth in children, characterized by a height-for-age measurement that falls below the standard for children of the same age, primarily as a result of chronic undernutrition during the early stages of life (Azzahra et al., 2025). This condition reflects long-term nutritional deprivation and exposure to adverse environmental conditions during the first years of life, particularly during the first 1,000 days, a critical developmental window that strongly influences growth and health outcomes throughout the life course. Beyond its immediate effects on physical growth, childhood stunting represents a complex public health problem that reflects broader social, environmental, and health system inequalities.

The consequences of stunting extend far beyond childhood growth impairment. Numerous studies have demonstrated that stunting is associated with significant long-term effects, including delayed cognitive development, reduced academic performance, decreased economic productivity in adulthood, and an increased risk of chronic diseases later in life (Awaludin et al., 2025). Children who experience stunting during early life often face lifelong disadvantages that affect educational attainment, labor market participation, and overall socioeconomic status. These long-term impacts not only affect individuals but also contribute to broader societal and economic burdens, particularly in low- and middle-income countries where the prevalence of stunting remains disproportionately high.

The determinants of childhood stunting are multifactorial and operate across multiple biological, behavioral, environmental, and socioeconomic domains. From a biological and health perspective, infectious diseases and inadequate nutritional intake play a crucial role in disrupting child growth. Evidence suggests that incomplete immunization coverage increases the risk of recurrent infections such as measles, diarrhea, and respiratory illnesses, which can impair nutrient absorption and contribute to growth failure (Solis-Soto et al., 2020). In parallel, nutritional deficiencies remain a central determinant of stunting. Chronic energy deficiency and insufficient intake of essential micronutrients, including iron, zinc, and vitamin A, have been consistently associated with impaired child growth and increased vulnerability to malnutrition (Ernawati, 2024). Inappropriate infant and young child feeding practices further exacerbate these risks and significantly contribute to poor nutritional status during early childhood.

Maternal factors also play a fundamental role in shaping child growth trajectories. Maternal age at pregnancy, maternal nutritional status, birth spacing, and maternal education have been identified as key predictors of stunting among children under five years of age (Yulika & Afrainin Syah, 2024). In addition, maternal height, antenatal health

conditions, and caregiving capacity influence both intrauterine growth and postnatal child development outcomes. Maternal characteristics therefore represent important intergenerational determinants of stunting, highlighting the importance of maternal health and nutrition during pregnancy and early child-rearing periods. Research has also shown that maternal height serves as a practical predictor of childhood stunting risk, reflecting cumulative nutritional and health conditions across generations (Rahman et al., 2016).

Beyond biological and maternal determinants, household and socioeconomic conditions significantly contribute to the risk of childhood stunting. Studies have identified several household-level factors associated with stunting, including non-exclusive breastfeeding during the first six months of life, low household socioeconomic status, preterm birth, short birth length, and low maternal education and stature (Beal et al., 2018). Environmental conditions further influence child growth outcomes, particularly in households with inadequate sanitation facilities, unsafe drinking water, and limited access to health services. These findings illustrate that stunting is not solely a nutritional problem but a multidimensional public health issue that reflects complex interactions between biological, social, and environmental determinants.

In response to the global burden of stunting, research addressing the determinants of childhood growth failure has expanded substantially over the past two decades. Studies examining the relationships between immunization, nutrition, maternal characteristics, and socioeconomic conditions have been conducted across multiple disciplines, including public health, epidemiology, nutrition science, and health policy. This growing body of literature reflects increasing recognition that stunting prevention requires integrated and multisectoral approaches that address health services, maternal and child nutrition, environmental conditions, and social protection policies simultaneously.

Despite the rapid expansion of scientific publications on childhood stunting, the overall structure and development of research within this field remain fragmented. While numerous empirical studies have investigated individual determinants of stunting, fewer studies have systematically mapped the intellectual landscape of the research domain. In particular, there remains limited bibliometric evidence that integrates the roles of immunization, nutrition, and maternal factors in shaping the broader scientific discourse on childhood stunting. Understanding how research themes evolve, how collaboration networks develop, and which topics dominate the scientific literature is essential for identifying research gaps and guiding future research priorities.

Bibliometric analysis offers a robust methodological approach to address these challenges by systematically examining publication trends, citation patterns, collaboration networks, and thematic structures within a particular field of research. Through quantitative mapping techniques, bibliometric studies enable researchers to identify influential authors, institutions, and countries, as well as dominant research themes and emerging knowledge clusters (Donthu et al., 2021). Such analyses provide a comprehensive overview of the scientific landscape and can inform future research agendas, policy development, and interdisciplinary collaboration.

Therefore, this study aims to conduct a bibliometric analysis of global research on childhood stunting with a particular focus on immunization, nutrition, and maternal

determinants. Specifically, this study seeks to map publication trends, identify key contributors and collaboration networks, and explore the thematic structure of research in this field. By providing a systematic overview of the global research landscape, this study contributes to a deeper understanding of how scientific knowledge on childhood stunting has evolved and highlights potential directions for future research and policy development (Passas, 2024).

Methods

Design

This study employed a quantitative bibliometric analysis to systematically map the global research landscape on childhood stunting determinants, with a particular focus on immunization, nutrition, and maternal factors. Bibliometric analysis was selected because it enables the quantitative evaluation of scientific publications, including publication trends, collaboration networks, citation patterns, and thematic development within a research field. This approach allows researchers to identify influential contributors, dominant research topics, and evolving knowledge structures within the literature.

The methodological framework of this study consisted of several stages, including identification of the research topic, development of the search strategy, retrieval of bibliographic data, document screening, data cleaning, bibliometric analysis, and interpretation of the results. The study followed established bibliometric research guidelines to ensure transparency and reproducibility in the data collection and analysis process.

Eligibility Criteria

Documents were selected based on predefined eligibility criteria to ensure their relevance to the objectives of this study. The inclusion criteria comprised publications addressing childhood stunting and its determinants, particularly those related to immunization, nutrition, and maternal factors. Only documents indexed in the Scopus database were considered, as this database provides comprehensive coverage of high-quality peer-reviewed international publications. The analysis included peer-reviewed journal articles and review articles written in English and published between 2010 and 2026. These criteria were applied to capture relevant and contemporary scientific contributions examining the determinants of childhood stunting.

Conversely, several types of publications were excluded to maintain the quality and consistency of the dataset. Conference papers, book chapters, editorials, letters, and notes were excluded because they generally provide limited bibliographic information for comprehensive bibliometric analysis. In addition, publications that were not directly related to childhood stunting determinants were removed during the screening stage. Articles lacking essential bibliographic metadata required for bibliometric mapping were also excluded. Finally, duplicate records identified during the data cleaning process were removed to ensure that each publication was represented only once in the final dataset used for analysis.

Information Sources

The bibliographic data used in this study were obtained from the Scopus database. Scopus was selected because it provides extensive coverage of peer-reviewed international journals across multiple scientific disciplines and offers high-quality bibliographic metadata suitable for bibliometric analysis. Additionally, Scopus includes comprehensive citation data, author affiliations, and indexing information that facilitate the construction of collaboration

and citation networks. The database search was conducted in February 2026 to ensure that the most recent publications were included in the analysis

Search Strategy

A structured search strategy was developed to retrieve publications related to childhood stunting determinants. The search was conducted within the title, abstract, and keyword fields in the Scopus database. Boolean operators were used to combine relevant keywords associated with childhood stunting and its determinants.The search query applied in the Scopus database was structured as follows:TITLE-ABS-KEY ("childhood stunting" OR "child stunting") AND ("immunization" OR "vaccination") AND ("nutrition" OR "malnutrition") AND ("maternal factors" OR "maternal health"). This search strategy was designed to capture publications that examine the relationships between childhood stunting and key determinants related to child health, nutrition, and maternal conditions. Filters were applied to limit results to journal articles and review articles published between 2010 and 2026.

Selection Process

The document selection process involved several screening stages to ensure the relevance and quality of the retrieved publications. First, all records obtained from the Scopus search were exported in CSV format, including bibliographic information such as author names, titles, abstracts, keywords, publication years, journals, affiliations, and citation counts.

Second, duplicate records were identified and removed during the data cleaning stage. Titles and abstracts were then screened to determine whether the publications met the inclusion criteria. Articles that did not focus on childhood stunting determinants were excluded during this stage. Finally, the remaining documents were reviewed to confirm their relevance to the study objectives. Only publications that met all eligibility criteria were included in the final bibliometric dataset.

Data Analysis and Synthesis of Results

Bibliometric analysis was conducted using VOSviewer version 1.6.20. VOSviewer was used to construct scientific visualization maps, including co-authorship networks, keyword co-occurrence networks, and thematic clusters within the literature. The analysis consisted of two main components. First, descriptive bibliometric indicators were calculated to summarize publication trends, document types, citation counts, and contributions from authors, institutions, and countries. Second, science mapping techniques were applied to visualize relationships between keywords and research themes. Keyword co-occurrence analysis was used to identify thematic clusters representing major research domains within childhood stunting research.

Results

This section presents the findings of the bibliometric analysis conducted to map the research landscape on childhood stunting determinants, particularly those related to immunization, nutrition, and maternal factors. The analysis focuses on identifying patterns within the scientific literature, including thematic structures, relationships among keywords, and the conceptual organization of research topics within the field. By examining keyword co-occurrence networks and thematic clustering, the results provide an overview of how research on childhood stunting has evolved and which major domains dominate the scholarly discourse. The findings are presented through network visualization and thematic cluster analysis to illustrate

the intellectual structure of the research field.

Keyword Co-Occurrence Network

The bibliometric mapping conducted using VOSviewer produced a network visualization illustrating the co-occurrence relationships among keywords in publications related to childhood stunting between 2010 and 2026. This visualization provides an overview of the conceptual structure of the research field by identifying frequently occurring keywords and their associations across the analyzed documents. The network map reveals the interconnected nature of research topics and allows the identification of thematic clusters representing dominant research domains.

As shown in **Figure 1**, the keyword "stunting" appears as the largest node and occupies a central position within the network, indicating its high frequency of occurrence and strong connections with other keywords. The centrality of this term demonstrates that stunting serves as the primary focal point within the scientific literature. Several related keywords are strongly connected to this central node, including child nutrition, maternal nutrition, malnutrition, infant, breastfeeding, and socioeconomics. These connections suggest that research on stunting has evolved within an integrated framework encompassing biological, nutritional, maternal, and socioeconomic determinants

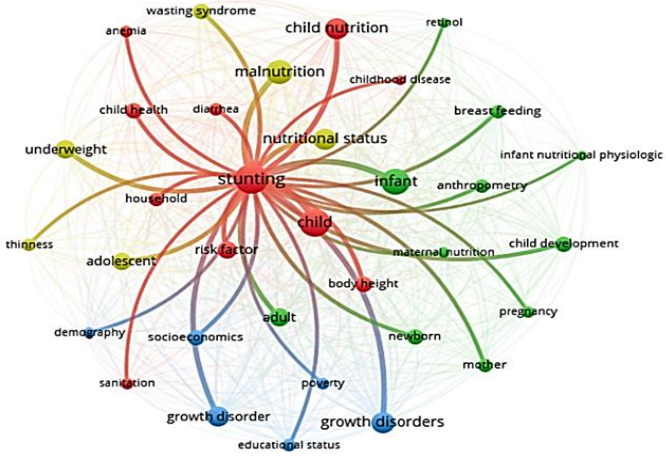

Figure 1 Co-occurrence of documents. Source: Scopus Analysis

Thematic Clusters in Childhood Stunting Research

The co-occurrence analysis grouped the keywords into four major thematic clusters based on the frequency of co-occurrence and the strength of relationships among terms. Each cluster is represented by a different color in the network visualization, reflecting distinct but interconnected research themes (**Table 1**).

Table 1. Research Clusters, Main Themes, and Associated Keywords

No	Cluster Color	Main Research Theme	Cluster Keywords
1	Red Cluster	Stunting and Child Health Risk Factors	stunting, child, child nutrition, child health, childhood disease, anemia, diarrhea, risk factor, body height, sanitation
2	Green Cluster	Maternal Factors and Early-Life Period	infant, maternal nutrition, pregnancy, mother, newborn, breastfeeding, child development, anthropometry, retinol
3	Blue Cluster	Socioeconomic Determinants	growth disorders, growth disorder, socioeconomics, poverty, educational status, demography, adult
4	Yellow Cluster	Nutritional Status and Malnutrition	malnutrition, nutritional status, underweight,

No	Cluster Color	Main Research Theme	Cluster Keywords
			thinness, wasting syndrome, adolescent, household

The first cluster (red) represents research focusing on clinical aspects and child health risk factors associated with stunting. This cluster includes keywords such as *stunting*, *child*, *child nutrition*, *child health*, *anemia*, *diarrhea*, *childhood disease*, *risk factor*, and *sanitation*. The presence of these terms indicates that a substantial portion of the literature examines the role of infectious diseases, micronutrient deficiencies, and environmental health conditions in contributing to impaired child growth. The cluster highlights the close relationship between child health status and nutritional outcomes.

The second cluster (green) reflects studies emphasizing maternal determinants and the early-life period. Keywords within this cluster include *infant*, *maternal nutrition*, *pregnancy*, *mother*, *newborn*, *breastfeeding*, *child development*, and *anthropometry*. These terms illustrate the strong focus of the literature on maternal health and the early developmental period as critical determinants of child growth. The presence of keywords related to pregnancy and infant development suggests that research in this area often examines factors influencing growth during the first 1,000 days of life.

The third cluster (blue) highlights the influence of socioeconomic determinants on childhood stunting. This cluster includes keywords such as *socioeconomics*, *poverty*, *educational status*, *demography*, and *growth disorders*. These terms indicate that structural and social determinants play an important role in shaping child nutritional outcomes. Research within this cluster frequently investigates the relationship between household socioeconomic conditions and access to adequate nutrition and health services.

The fourth cluster (yellow) represents research related to nutritional status and forms of malnutrition associated with stunting. Keywords within this cluster include *malnutrition*, *nutritional status*, *underweight*, *thinness*, *wasting syndrome*, and *household*. The presence of these keywords suggests that stunting is often examined within the broader context of child undernutrition and growth failure.

Overall, the clustering results demonstrate that research on childhood stunting has developed into a multidimensional field integrating biological, maternal, environmental, and socioeconomic perspectives. The interconnected nature of the clusters indicates that stunting is increasingly studied as a complex public health issue influenced by multiple determinants operating across different levels.

Discussion

The present bibliometric analysis provides a comprehensive overview of the intellectual structure and thematic development of global research on childhood stunting, particularly studies focusing on immunization, nutrition, and maternal determinants. The keyword co-occurrence network reveals that research on childhood stunting has evolved into a multidimensional and interdisciplinary field integrating biological, nutritional, maternal, and socioeconomic perspectives. The central position of the keyword *stunting* within the network highlights its role as the primary focal point in the scientific literature, while its strong connections with numerous related terms demonstrate that stunting is increasingly recognized as a complex public health issue influenced by multiple interacting determinants.

The first thematic cluster identified in this study highlights the importance of child

health risk factors, particularly infectious diseases and micronutrient deficiencies, in contributing to growth failure. Keywords such as anemia, diarrhea, and childhood disease indicate that a substantial body of research has examined the interaction between infection and malnutrition during early childhood. These findings are consistent with existing evidence demonstrating that recurrent infections disrupt nutrient absorption and increase metabolic demands, thereby worsening growth impairment among children (Natalie et al., 2025). Environmental factors such as sanitation also appear within this cluster, suggesting that inadequate sanitation and poor hygiene practices remain significant determinants of child health and nutritional outcomes. This pattern reflects the growing recognition that childhood stunting is closely associated with environmental health conditions and exposure to infectious diseases.

The second thematic cluster emphasizes the role of maternal determinants and early-life conditions in shaping child growth trajectories. Keywords such as maternal nutrition, pregnancy, breastfeeding, and infant illustrate the strong emphasis placed on maternal health and caregiving practices during the early stages of life. This focus aligns with the life-course perspective of child development, which emphasizes the importance of the first 1,000 days as a critical window for preventing growth faltering. Research has consistently demonstrated that maternal nutritional status during pregnancy plays a crucial role in determining birth outcomes and subsequent child growth patterns (Rotella et al., 2025). In addition, maternal characteristics such as height and nutritional status have been identified as strong predictors of childhood stunting risk, reflecting the intergenerational transmission of nutritional disadvantage.

These findings highlight the importance of strengthening maternal health and nutrition programs as a key strategy in preventing childhood stunting. Recent empirical studies have further confirmed that maternal-related factors, including maternal age, maternal nutritional status, and maternal health conditions during pregnancy, significantly contribute to the risk of childhood stunting among children under five years of age (Dayani & Widyantari, 2024). The third thematic cluster highlights the influence of socioeconomic determinants on childhood stunting. Keywords such as poverty, educational status, and socioeconomics indicate that structural and social inequalities play a significant role in shaping child nutritional outcomes. Children living in households with limited economic resources often encounter barriers to accessing adequate nutrition, healthcare services, and safe living environments (Karczewski et al., 2020).

These findings are consistent with global evidence demonstrating that socioeconomic disparities remain among the strongest drivers of childhood stunting in many low- and middle-income countries (Jeong et al., 2025). Investments in infrastructure and social services, including water supply systems, sanitation facilities, healthcare access, and social protection programs, have therefore been identified as essential components of comprehensive strategies aimed at improving early childhood development and reducing undernutrition (Balza et al., 2025).

The fourth thematic cluster focuses on the broader framework of malnutrition and nutritional status. Keywords such as malnutrition, underweight, thinness, and wasting syndrome indicate that stunting is frequently examined within the wider spectrum of child growth disorders. This cluster illustrates that research on stunting is closely connected with broader

discussions regarding child undernutrition and nutritional deficiencies. Previous studies have identified multiple determinants of child undernutrition operating at different levels, including maternal factors, child-related conditions, household characteristics, and community-level influences. Among these determinants, maternal education has been identified as one of the most influential predictors of child nutritional outcomes, while low birth weight remains a significant risk factor associated with impaired growth (Mukisa et al., 2024).

The clustering pattern observed in this study also reflects the increasingly interdisciplinary nature of research on childhood stunting. The strong interconnections between clusters related to maternal health, nutrition, infectious diseases, and socioeconomic conditions suggest that contemporary research approaches increasingly recognize the multifactorial nature of stunting. This finding aligns with the widely recognized conceptual framework of child undernutrition, which emphasizes that stunting arises from both immediate determinants, such as inadequate dietary intake and infectious diseases, and underlying determinants including socioeconomic conditions, sanitation, and access to health services (Black et al., 2013). The integration of these diverse research themes demonstrates that addressing childhood stunting requires coordinated interventions across multiple sectors, including health, nutrition, education, and social protection.

Another important finding from this bibliometric analysis is the increasing recognition of the life-course perspective in stunting research. The presence of keywords related to maternal nutrition, infant development, and early childhood health indicates that researchers increasingly view stunting as the cumulative result of risks occurring across multiple stages of development. Global evidence has demonstrated that maternal height, maternal nutritional status, maternal education, and household poverty significantly influence child growth outcomes and contribute to the persistence of intergenerational cycles of undernutrition (Khatun et al., 2019). This perspective highlights the importance of early interventions targeting maternal and child health to prevent long-term growth impairment. Previous global analyses have also identified multiple risk factors contributing to childhood stunting across developing countries, including poor maternal health, inadequate nutrition, and unfavorable socioeconomic conditions, which collectively influence child growth outcomes (Danaei et al., 2016).

Despite the growing volume of scientific publications addressing childhood stunting, important research gaps remain. The bibliometric mapping suggests that while considerable attention has been given to nutritional and maternal determinants, there is still a need for more integrated research examining the combined influence of health services, environmental conditions, and socioeconomic policies on child growth outcomes. In particular, future research should explore how multisectoral interventions integrating maternal health services, nutrition programs, immunization coverage, sanitation improvements, and social protection policies can be implemented effectively in different contexts (Dwi et al., 2024). Bibliometric evidence can therefore play an important role in guiding future research priorities and fostering interdisciplinary collaboration across fields.

Furthermore, the findings of this study have important implications for public health policy and program development. The strong interconnectedness between maternal health, child nutrition, and

socioeconomic determinants observed in the keyword network suggests that single-sector interventions are unlikely to produce substantial reductions in childhood stunting. Instead, integrated strategies that simultaneously address maternal nutrition, infant feeding practices, immunization coverage, environmental sanitation, and household socioeconomic conditions are required to achieve sustainable improvements in child growth outcomes (Null et al., 2018). Such multisectoral approaches have been increasingly emphasized in global nutrition initiatives aimed at accelerating progress in reducing childhood stunting worldwide.

Overall, this bibliometric analysis contributes to a deeper understanding of the evolving research landscape on childhood stunting. By identifying dominant research themes, collaboration patterns, and knowledge clusters within the scientific literature, this study provides valuable insights into how research on stunting has developed over time. These findings highlight the importance of interdisciplinary research and integrated policy approaches in addressing one of the most persistent challenges in global child health.

Implications and limitations

The findings provide important conceptual and scientific implications for future research on childhood stunting by demonstrating its evolution into a multidisciplinary field that integrates maternal health, child nutrition, infectious diseases, and socioeconomic determinants, highlighting the need for interdisciplinary approaches linking public health, nutrition science, epidemiology, and social policy to better understand its complex drivers. The results also emphasize a growing life-course perspective, particularly the critical role of maternal and early-life factors, reinforcing the importance of research that integrates maternal health services, infant feeding practices, immunization coverage, and environmental health interventions, as well as strengthened collaboration between research institutions and international organizations to support more comprehensive and evidence-based prevention strategies. However, several limitations should be acknowledged, including reliance on a single database which may not capture all relevant publications, potential citation bias that may overrepresent highly cited studies while underrepresenting newer research, and restriction to English-language publications, which may exclude relevant findings from other contexts; therefore, future studies should incorporate multiple databases and broader language coverage to provide a more comprehensive understanding of the global research landscape on childhood stunting.

Relevance to Practice

The findings offer important insights for healthcare professionals, policymakers, and public health practitioners working to reduce childhood stunting by highlighting the interconnected roles of maternal health, nutrition, immunization coverage, and socioeconomic conditions in shaping child growth outcomes. These results suggest that effective prevention strategies should move beyond single-focus nutrition interventions and adopt integrated approaches combining maternal health services, child nutrition programs, vaccination coverage, sanitation improvements, and social protection initiatives. For healthcare practitioners, particularly in maternal and child health services, the findings emphasize the importance of early interventions during pregnancy and infancy, including strengthening maternal nutrition, promoting exclusive breastfeeding, ensuring adequate immunization, and

improving access to primary healthcare. For policymakers, the results underline the need for multisectoral policies addressing structural determinants such as poverty, education, sanitation, and healthcare accessibility, thereby supporting the development of more comprehensive and sustainable strategies to reduce the global burden of childhood stunting.

Conclusion

This study provides a comprehensive overview of the global research landscape on childhood stunting, highlighting its evolution into a multidisciplinary field that integrates biological, maternal, environmental, and socioeconomic perspectives. The findings indicate that childhood stunting is increasingly understood as a complex public health issue shaped by multiple interacting determinants across the life course, as reflected in key thematic areas such as child health risk factors, maternal and early-life influences, socioeconomic conditions, and nutritional status. This underscores the growing recognition of the need for integrated and interdisciplinary approaches to address both immediate and underlying causes of undernutrition. Furthermore, the study emphasizes the importance of multisectoral strategies and expanded research efforts, particularly in low- and middle-income countries, while identifying critical research gaps and providing a foundation for future research and policy development aimed at improving child growth and health outcomes globally.

Funding

This research received no external funding.

CrediT Authorship Contributions Statement

Asep Barkah: Conceptualization, Methodology, Supervision, Writing – Original Draft, Validation.

Usep: Methodology, Formal Analysis, Supervision.

Ujang Sony: Investigation, Data Curation, Resources, Project Administration.

Dani Nugraha: Investigation, Data Curation, Resources, Project Administration, Visualization, Writing – Review & Editing.

Kamaludin Firdaus Amin: Software, Data Curation, Visualization, Investigation, Validation.

Vega Lestari: Writing – Review & Editing.

Achmad Fauzi: Writing – Review & Editing.

Conflicts of Interest

There is no conflict of interest.

Acknowledgments

The authors would like to acknowledge the researchers whose published studies contributed to the development of this review. Their work provided valuable insights and evidence that formed the basis of this study.

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