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Socioeconomic Determinants of Stunting Among Children Under Five in Developing Countries: A Scoping Review

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ABSTRACT

Background: Stunting among children under five remains a major public health concern in developing countries. Socioeconomic disadvantages may affect child growth through inadequate nutrition, limited healthcare access, and unfavorable living conditions.
Purpose: This scoping review aimed to identify and describe socioeconomic determinants associated with stunting among children under five in developing countries.
Methods: A scoping review was conducted following the Arksey and O'Malley framework and PRISMA-ScR guidelines. Relevant studies published between 2015 and 2025 were identified through four electronic databases. Ten studies met the eligibility criteria and were included in the descriptive synthesis.
Results: The included studies identified household income, parental education, employment, sanitation, and access to healthcare as socioeconomic factors associated with stunting among children under five. These factors may influence child growth through dietary adequacy, caregiving practices, healthcare utilization, and household living conditions.
Conclusion: Stunting is a multifactorial problem associated with socioeconomic conditions at household and community levels. Prevention strategies should integrate nutrition interventions with efforts to improve parental education, household welfare, healthcare access, and living environments.

Keywords : Developing Countries, Scoping Review, Socioeconomic Determinants, Stunting, Under-Five Children

BACKGROUND

Stunting, defined by the World Health Organization (WHO) as a height-for-age z-score below two standard deviations from the median of the WHO Child Growth Standards, remains a major public health concern among children under five in developing countries (Alam et al., 2020). Stunting reflects chronic nutritional deprivation and adverse socioeconomic conditions

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that may impair children's physical growth, cognitive development, learning capacity, and future economic productivity (Tola et al., 2023). The burden of stunting remains particularly high in low- and lower-middle-income countries, where socioeconomic inequalities can limit families' access to adequate nutrition and essential health services (Ssentongo et al., 2021).

Socioeconomic determinants, including parental education, household income, employment stability, and living conditions, are important factors associated with children's nutritional outcomes (Takele et al., 2022). Evidence from sub-Saharan Africa and South Asia indicates that children in the poorest household wealth groups experience a greater risk of stunting than those in wealthier households (Baye et al., 2020). Maternal education has also been associated with feeding practices, sanitation behaviors, and healthcare utilization, which may influence children's growth and nutritional status (Adedokun & Yaya, 2021; Amugsi & Dimbuene, 2022). In Indonesia, socioeconomic disparities have similarly been linked to unequal nutritional outcomes among children, highlighting the importance of household economic resources and parental education in stunting prevention (Yani et al., 2023).

Environmental conditions further interact with socioeconomic disadvantage. Limited access to safe water, inadequate sanitation, and poor housing conditions can increase children's exposure to infection and contribute to impaired linear growth (Kibemo et al., 2022). These circumstances may coexist with rural residence, inadequate infrastructure, and limited healthcare access, reinforcing inequalities in child health (Martin et al., 2020). Previous research has therefore examined stunting through multiple socioeconomic, environmental, and structural pathways. However, differences in cultural contexts, governance, and social protection systems complicate comparisons across countries and may affect the applicability of findings across settings (Biegert et al., 2022). In addition, the predominance of cross-sectional studies limits the ability to establish causal relationships, while fragmented analytical approaches may not adequately capture determinants operating at individual, household, community, and policy levels (Hertog, 2023; Mazeikaite et al., 2021).

These limitations support the need for a scoping review that maps the breadth and nature of available evidence rather than focusing exclusively on estimating pooled effects. Scoping reviews are particularly useful for examining conceptually diverse evidence, identifying knowledge gaps, and informing future research priorities (Estecha Querol et al., 2022). For nursing practice, a comprehensive understanding of socioeconomic determinants may strengthen family-centered nutritional assessment, identification of vulnerable households, health education, and coordination of community-based interventions. Accordingly, this scoping review aimed to map the available evidence on socioeconomic determinants associated with stunting among children under five in developing countries and identify gaps in the literature relevant to nursing practice and child health services.

METHODS

Design and Setting

This study employed a scoping review design to map the available evidence on socioeconomic determinants associated with stunting among children under five in developing countries. The review followed the methodological framework developed by Arksey and

O'Malley (2005), with refinements proposed by Levac et al. (2010), and was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) guidelines (Tricco et al., 2018). The review process comprised identifying the research question, identifying relevant studies, selecting eligible studies, charting the data, collating and summarizing the findings, and conducting methodological quality appraisal.

The review protocol was developed before the review process but was not formally registered. The PRISMA-ScR checklist was used to guide reporting and improve transparency. The review focused on socioeconomic determinants at the economic, educational, environmental, and social levels.

Participants and Sampling

The units of analysis were published research articles rather than individual participants recruited directly by the reviewers. Eligible studies investigated stunting among children under five in developing countries or low- and middle-income countries (LMICs) and examined socioeconomic determinants using quantitative or mixed-methods designs.

Studies were eligible if they were peer-reviewed articles published in English between 2015 and 2025 and explicitly examined socioeconomic variables associated with stunting. Studies were excluded if they used qualitative methods exclusively without quantitative outcomes, were reviews, commentaries, editorials, or conference abstracts, or did not explicitly address socioeconomic determinants.

The literature search identified studies published between 2015 and 2025. The selection process involved screening titles and abstracts, followed by full-text assessment against the eligibility criteria. A total of 10 studies met the inclusion criteria and were included in the final review. The characteristics and findings of these studies were charted and synthesized descriptively. The study selection process is presented in the PRISMA-ScR flow diagram (Figure 1), and the characteristics of the included studies are summarized in Table 1.

Instruments and Data Collection

A comprehensive literature search was conducted between January and April 2025 using four electronic databases: Scopus, PubMed, Web of Science, and ScienceDirect. Search terms and Boolean operators were adapted to the requirements of each database. The search strategy combined terms related to stunting, socioeconomic determinants, and developing countries, as follows: ("stunting" OR "child malnutrition" OR "growth retardation") AND ("socioeconomic" OR "income" OR "education" OR "employment" OR "wealth" OR "inequality" OR "poverty") AND ("developing countries" OR "low and middle income countries" OR "LMICs"). The search was restricted to peer-reviewed articles published in English between 2015 and 2025. Additional publications were identified through reference-list screening and citation chaining of included studies and relevant systematic reviews.

All retrieved records were exported to Mendeley Reference Manager for reference management and duplicate removal. Study selection was conducted in two stages: title and abstract screening, followed by full-text assessment. The screening procedures were used to determine whether each publication met the predefined eligibility criteria.

Data were extracted using a standardized charting framework developed for this review. The extracted information included author and publication year, country, study design, data source, sample characteristics, socioeconomic variables, stunting measurement, and principal findings, including the reported direction and strength of associations. Socioeconomic variables included parental education, household income, employment, water, sanitation and hygiene (WASH) indicators, and residential setting. The complete data charting summary is provided in Supplementary Table S1.

Data Analysis

The extracted data were synthesized descriptively and thematically to identify recurring patterns, variations across geographical and socioeconomic contexts, and relationships among reported determinants of stunting. Findings were organized into three principal domains: economic determinants, including household income, employment, and poverty; educational determinants, including maternal and paternal education; and environmental and social determinants, including sanitation, access to clean water, healthcare services, and residential setting.

The synthesis focused on the distribution and characteristics of the available evidence rather than calculating pooled effect estimates. This approach was appropriate for the scoping review objective of mapping the range of socioeconomic determinants investigated in the literature and identifying evidence gaps.

Methodological quality appraisal was conducted using the Joanna Briggs Institute (JBI) critical appraisal checklist for analytical cross-sectional studies, where applicable. The appraisal considered the clarity of study objectives, sampling procedures, measurement of exposures and outcomes, and identification and management of potential confounding factors. Quality findings were summarized descriptively alongside the evidence synthesis. The criteria used to classify studies as high, moderate, or low quality should be specified in the full methodology or supplementary materials.

Ethical Considerations

This study synthesized evidence from previously published studies and did not involve direct human participant recruitment, interventions, or the collection of identifiable personal data. Ethical considerations were addressed through accurate attribution of the original sources and responsible reporting of the findings. Formal ethical approval was not obtained for this review.

RESULTS

Study Selection

The database search identified 1,263 records, including 412 from Scopus, 388 from PubMed, 286 from Web of Science, and 177 from ScienceDirect. After removing 312 duplicate records using Mendeley, 951 records remained for title and abstract screening. Of these, 814 records were excluded, and 137 full-text articles were assessed for eligibility. Following full-text assessment, 127 articles were excluded for the following reasons: wrong population (n = 39), wrong outcome (n = 28), wrong study design (n = 20), inaccessible full text (n = 30), and study

location outside developing countries (n = 10). The remaining 10 articles met the inclusion criteria, underwent critical appraisal, and were included in the final review and evidence synthesis.

The PRISMA-ScR flow diagram is shown in Figure 1.

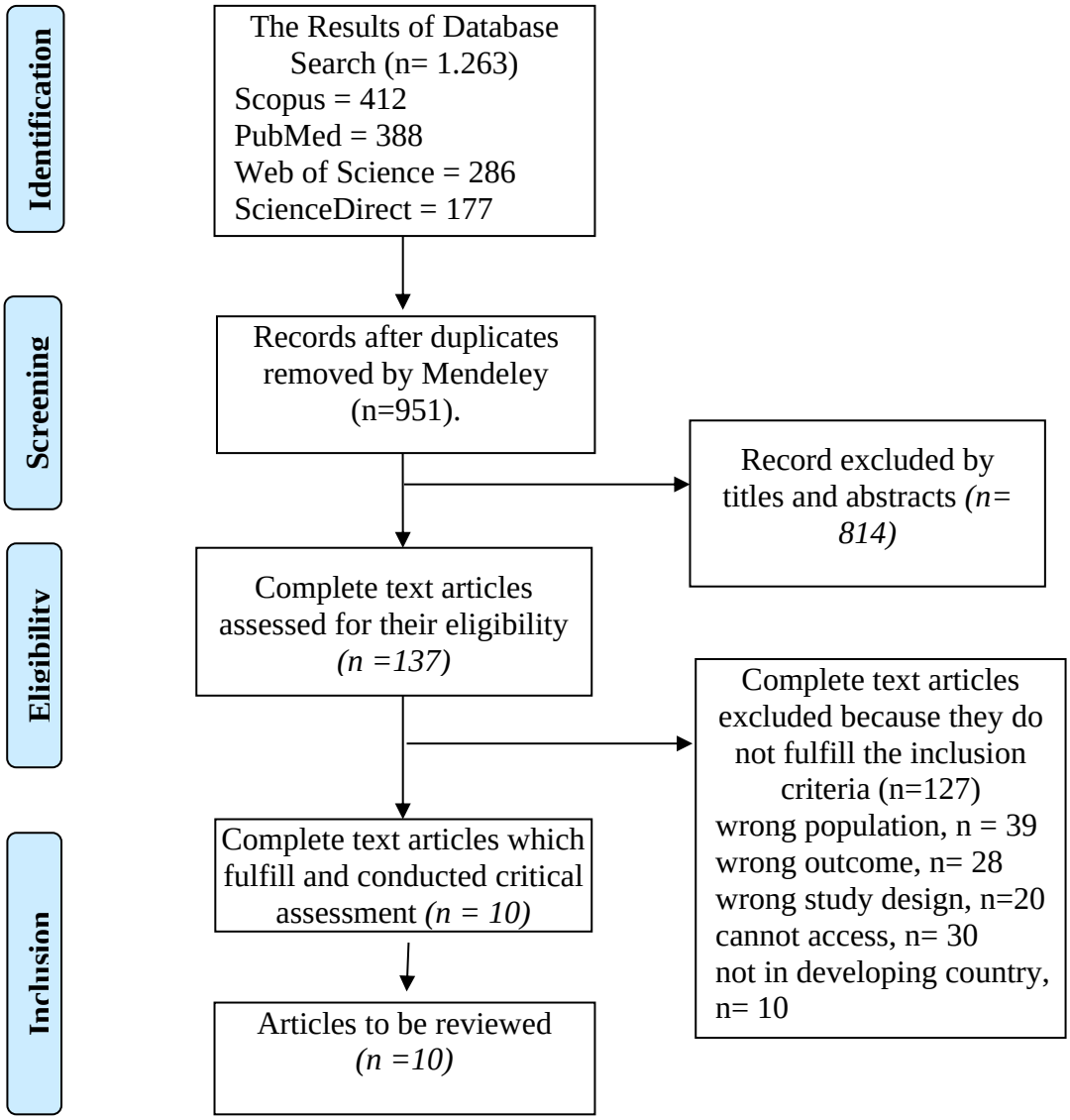


Figure 1. PRISMA Flow Diagram

Characteristics of Included Studies

The 10 included studies examined socioeconomic determinants of stunting among children under five in developing countries across Asia, Africa, and Latin America. The characteristics of the included studies are summarized as follows:

1. Study design: The included studies employed observational research designs, including cross-sectional, cohort, and case-control studies, as reported in the original publications.
2. Data sources: The studies used various data sources, including Demographic and Health Surveys (DHS), national nutrition surveys, and community-based data.

3. Sample characteristics: The studies primarily examined children under five years of age. Sample sizes varied across studies according to their populations and research designs.
4. Stunting measurement: Stunting was generally assessed using height-for-age z-scores (HAZ) based on the WHO Child Growth Standards.

Table 1. Representative Studies on Socioeconomic Determinants of Stunting in Developing Countries (2015-2025)

No	Author	Country	Design/ Data Source	Sample Size	Socio-economic Determinant Accessed	Stunting Measure	Main Finding
1	(Haile & Legisso, 2024)	Ethiopia	Cross-sectional; national/regional survey analyses (DHS-based)	National representative samples	Household wealth, maternal education, urban/rural residence, WASH	HAZ (WHO height-for-age z-score)	Higher household wealth and maternal education associated with lower stunting; regional disparities (e.g., Amhara higher).
2	(Tamir et al., 2024)	Low & lower-middle income African countries	Pooled cross-sectional analyses (DHS & national surveys)	multi-country pooled (tens of thousands)	Wealth index, maternal education, access to services, community factors	HAZ / prevalence (%)	Consistent association: low wealth, low maternal education, poor service access → higher stunting.
3	(Addae et al., 2024)	Ghana	Cross-sectional, national survey analysis (national survey)	reported using national survey sample (6-23 mo subset in paper)	Household socioeconomic status, WASH, low birth weight	HAZ (stunting 6-23 mo)	Low birth weight, poor household SES, and inadequate WASH associated with higher

No	Author	Country	Design/ Data Source	Sample Size	Socio-economic Determinant Accessed	Stunting Measure	Main Finding
							stunting/wasting.
4	(Olakunle, 2024)	12 Sub-Saharan African countries	Serial DHS analyses/decomposition methods	Multi-country DHS samples (years 2000–2020)	Wealth, maternal education, service coverage, food security indicators	HAZ / % stunted	Decomposition: changes in wealth and maternal education explain large shares of stunting reduction in some countries.
5	(Wulandari et al., 2025)	Indonesia	Cross-sectional / national survey subset	sample (children <2 yrs in low-income households), reported n in paper	Household income, maternal employment, wealth quintile	HAZ / stunting prevalence	Among low-income families, 19% of children <2 yrs stunted; maternal employment and poverty linked to risk.
6	(Asgedom et al., 2024)	Ethiopia (comparative context)	Cross-sectional, community / DHS analyses	ranges (several hundreds to thousands)	Maternal education, household wealth, maternal health	HAZ / stunting categories	Confirmed association between poor socioeconomic conditions and higher stunting across settings.
7	(Gebregergis, 2024)	Ethiopia	Cross-sectional;	national DHS samples	Wealth index, maternal	HAZ; concentr	Socioeconomic inequalitie

No	Author	Country	Design/ Data Source	Sample Size	Socio-economic Determinant Accessed	Stunting Measure	Main Finding
			decomposition analysis	/ study-specifics	education, sanitation	ation indices	s (wealth, education) are major contributors to stunting distribution.
8	(Tamanna et al., 2025)	Multi-country (DHS based predictive modeling)	Cross-sectional / predictive models (Scientific Reports)	large DHS-derived samples	Mother's education, father's occupation, wealth index, toilet facility	HAZ; Shapley / ML explainers	Mother's education, father's occupation, and wealth index among top predictors of stunting in SHAP/ML models.
9	(Sahiledengle et al., 2022)	Ethiopia	Cross-sectional; WASH and child growth	community / DHS-based samples	Sanitation, housing conditions ,water source, household SES	HAZ / stunting prevalence	Access to improved sanitation associated with better linear growth; WASH mediates SES stunting link.
10	(Soofi et al., 2023)	Pakistan	Cross-sectional; National Nutrition Survey / DHS-based analysis	national samples (NNS 2018 / survey samples)	Maternal education, household wealth, maternal and child health factors	HAZ / stunting prevalence	Maternal education, household socioeconomic status and maternal/child health services associated

No	Author	Country	Design/ Data Source	Sample Size	Socio-economic Determinant Accessed	Stunting Measure	Main Finding
							with stunting in Pakistan.

Thematic Synthesis of Socioeconomic Determinants

1. Economic Determinants

Economic deprivation consistently emerged as a primary driver of stunting. Children from households in the lowest income quintile were up to 2.5 times more likely to be stunted than those in the highest quintile (Wulandari et al., 2025). Studies from sub-Saharan Africa and South Asia demonstrated that low household income, food insecurity, and unstable employment jointly contributed to inadequate dietary diversity and maternal undernutrition (Tamir et al., 2024). Additionally, longitudinal decomposition analyses revealed that improvements in household wealth accounted for up to 40% of national stunting reduction over two decades (Olakunle, 2024).

2. Educational Determinants

Maternal education was the most consistent protective factor.

Children of mothers with secondary or higher education had 30–50% lower risk of stunting compared to those with no formal education (Tamir et al., 2024). Educated mothers were more likely to adopt optimal feeding practices, ensure immunization completion, and maintain hygiene. While paternal education showed smaller effects, it remained positively associated with household food security and healthcare access (Tamanna et al., 2025). Several studies emphasized the synergistic effect of dual parental education, which significantly enhanced child growth outcomes.

3. Environmental and Social Determinants

Environmental conditions particularly sanitation, access to clean water, housing quality, and rural residence played a critical role in mediating socioeconomic effects. Children in households without improved sanitation had a 25–30% higher stunting risk, while unsafe water sources and overcrowded living conditions increased exposure to diarrheal infections and intestinal parasites (Sahiledengle et al., 2022). Rural residence was consistently linked with higher stunting prevalence due to limited healthcare infrastructure, low service utilization, and geographical isolation. Studies integrating the WASH nutrition pathway confirmed that improved sanitation mediates the relationship between household SES and stunting (Gebregergis, 2024).

4. Cross Regional Patterns

Regional comparison revealed distinct but overlapping determinants:

a. South Asia (e.g., Bangladesh, India, Nepal): highest prevalence; wealth inequality and maternal education were dominant predictors.
b. Sub-Saharan Africa: multifactorial drivers involving low wealth, sanitation deficits, and limited maternal healthcare.
c. Latin America: lower prevalence due to policy-led nutrition programs, conditional cash transfers, and education-driven interventions.

5. Summary of Evidence

Overall, the findings demonstrate a robust, cross-contextual association between socioeconomic inequality and stunting. The evidence aligns with the WHO Social Determinants of Health framework, emphasizing that childhood malnutrition is not merely a biological outcome but a manifestation of structural inequity. Across all regions, three domains economic deprivation, educational disadvantage, and environmental inadequacy form the core triad sustaining intergenerational malnutrition.

DISCUSSION

This scoping review provides a comprehensive synthesis of evidence (2015–2025) on the socioeconomic determinants of stunting among children under five in developing countries. The findings collectively demonstrate that stunting is not merely a nutritional condition but a structural manifestation of enduring social and economic inequities. The results reinforce the theoretical premise of the World Health Organization's Social Determinants of Health (SDH) framework, which asserts that health outcomes are fundamentally shaped by the circumstances in which individuals are born, grow, and live (WHO, 2022).

1. Economic Disparities as Structural Drivers

Economic deprivation emerged as a fundamental and cross-cutting determinant of stunting. Studies consistently revealed that children from the poorest wealth quintiles were two to three times more likely to experience stunting compared to their wealthier counterparts (Soofi et al., 2023; Tamir et al., 2024; Wulandari et al., 2025). This finding underscores that limited income restricts household capacity to secure diversified diets, adequate healthcare, and safe living environments all of which are critical pathways linking poverty to child undernutrition.

Longitudinal analyses further demonstrated that improvements in household wealth and maternal employment substantially contributed to reductions in national stunting prevalence (Olakunle, 2024). However, income inequality within countries continues to exacerbate disparities in child growth outcomes, indicating that economic growth alone is insufficient without equitable redistribution and targeted social protection measures. These results highlight stunting as both a symptom and a perpetuator of intergenerational poverty.

2. Educational Attainment and Knowledge Empowerment

Maternal education consistently emerged as a powerful protective factor against stunting. Mothers with secondary or higher education were up to 50% less likely to have stunted children (Laksono et al., 2022). Education enhances health literacy, improves decision-making autonomy, and promotes timely utilization of antenatal and child health services.

Paternal education, while showing smaller effects, contributes to household financial stability and decision-making on food allocation and healthcare access.

These findings support the human capital theory, which posits that education not only enhances earning potential but also improves cognitive and behavioral capacities related to health promotion. The synergistic effect of dual parental education reflects the broader social capital embedded within households that can buffer against poverty-induced nutritional risks.

3. Environmental and Contextual Determinants

Environmental and social contexts including access to clean water, sanitation, and safe housing remain critical mediators in the stunting pathway. Inadequate sanitation was associated with a 25–30% increase in stunting risk (Gebregergis, 2024; Sahiledengle et al., 2022). Recurrent diarrheal infections and intestinal parasites, often linked to poor WASH conditions, impair nutrient absorption and exacerbate growth retardation.

Children residing in rural or marginalized communities face double burdens: structural poverty and infrastructural deprivation. The limited availability of health services, low access to fortified foods, and inadequate public sanitation systems further amplify disparities. Consequently, interventions to reduce stunting must move beyond nutrition-specific approaches to include cross-sectoral programs integrating WASH, poverty alleviation, and rural infrastructure development.

4. Regional Variations and Policy Implications

Cross-regional synthesis revealed clear contextual nuances.

a. In South Asia, high population density, gender inequality, and early maternal age compound the effects of poverty and education gaps, producing some of the world's highest stunting rates.
b. In Sub-Saharan Africa, complex interactions between food insecurity, inadequate healthcare, and poor sanitation persist despite improvements in economic growth.
c. In Latin America, policy-led initiatives such as conditional cash transfer programs (Bolsa Família, Oportunidades) and early childhood nutrition interventions have demonstrated measurable success in reducing stunting prevalence.

These regional contrasts emphasize that while the underlying socioeconomic mechanisms are universal, policy contexts and governance capacity determine their magnitude and impact. Integrated approaches that align nutrition, education, and poverty reduction policies are thus essential. In line with the Sustainable Development Goals (SDGs) particularly SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), and SDG 10 (Reduced Inequalities) stunting reduction must be reframed as a multisectoral development agenda, not merely a public health target.

5. Theoretical Integration and Global Relevance

The patterns observed across diverse settings affirm the relevance of the Social Determinants of Health (SDH) model in understanding stunting. This framework recognizes that structural inequities income, education, gender, and environmental context create and

perpetuate health disparities. The review also aligns with the UNICEF conceptual framework of malnutrition, where inadequate dietary intake and disease interact within broader socioeconomic and political environments.

By synthesizing these perspectives, the present review contributes to a more integrated theoretical understanding of stunting as a socially produced health outcome. It suggests that addressing stunting effectively requires upstream policy actions, including poverty alleviation, universal education, and equitable infrastructure distribution.

6. Research Gaps and Directions for Future Studies

Despite extensive literature, several critical research gaps persist:

a. Causality and temporal dynamics: The predominance of cross-sectional designs limits causal inference. Future studies should employ longitudinal, quasi-experimental, or panel designs to establish temporal relationships between socioeconomic transitions and child growth outcomes.
b. Policy-level determinants: Few studies examine macro level variables such as public health expenditure, social safety nets, or fiscal decentralization and their influence on stunting reduction.
c. Intersectionality: Further research is needed to explore how socioeconomic status interacts with gender, ethnicity, or geographic vulnerability, shaping differential risks of stunting.
d. Data harmonization: The heterogeneity of measurement approaches calls for standardized indicators to enable meaningful cross-country comparisons and meta-analytical synthesis.

7. Summary of Key Insights

In summary, this review reveals that socioeconomic inequalities manifested through low income, limited parental education, and inadequate living environments constitute the central triad sustaining childhood stunting in developing countries. Efforts to address stunting must therefore transcend nutritional interventions, focusing instead on equity-oriented social policies that integrate health, education, and economic development sectors.

The evidence underscores that progress toward the SDGs will depend not only on improving access to food and healthcare but also on dismantling the structural inequities that constrain children's potential from birth.

Limitations

This review included 10 studies, which may limit the breadth of evidence available to describe socioeconomic determinants of stunting among children under five in developing countries.

Implications for Nursing Practice

The findings highlight the importance of integrating socioeconomic factors into nursing assessments and stunting prevention programs. Nurses can strengthen health education, support maternal nutrition, and collaborate with families and communities to address socioeconomic

barriers. Further research should use longitudinal designs to examine causal relationships and evaluate context-specific interventions for stunting prevention.

CONCLUSION

This scoping review identified socioeconomic factors associated with stunting among children under five in developing countries, including household income, parental education, maternal employment, and household conditions. These findings highlight that stunting is influenced by interconnected socioeconomic inequalities, emphasizing the importance of considering social and economic contexts in stunting prevention.

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AUTHOR CONTRIBUTIONS

Ita Hikmah Hidayati: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing, original draft. **Djauhar Ismail:** Supervision, Validation. **Endang Koni Suryaningsih:** Supervision, Writing, review and editing. All authors approved the final manuscript and agree to be accountable for their contributions.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

DECLARATION OF AI USE

During manuscript preparation, the authors used ChatGPT (OpenAI) for language editing and paraphrasing. The authors reviewed and edited the output and remain responsible for the content and integrity of the article.

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