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UNDERSTANDING ACUTE MALNUTRITION: A GLOBAL LITERATURE REVIEW ON RISK PROFILES IN UNDER-FIVE CHILDREN

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ABSTRACT

Acute malnutrition in children under five remains a complex and multidimensional global public health issue. This study aims to identify and analyze the key risk factors of acute malnutrition based on a review of 10 primary research articles from various developing countries published between 2016 and 2024. A narrative literature review method was used, guided by the UNICEF conceptual framework that categorizes the causes of malnutrition into immediate, underlying, and basic levels. The findings reveal that inadequate feeding practices, recurrent infectious diseases, low maternal education, household poverty, food insecurity, and poor sanitation are the most consistently associated factors with wasting and SAM. Thematic analysis also highlights the interplay between socioeconomic status and poor caregiving as major determinants. The study concludes that nutrition interventions must be integrated with maternal education, improved sanitation, and household economic empowerment. These findings have important implications for evidence-based policy formulation at national and international levels.

Keywords: *Acute Malnutrition, Feeding Practices, Nutrition Status, Poverty, Sanitation, Under-Five Children*

INTRODUCTION

Malnutrition remains one of the most persistent and complex global health challenges, particularly among children under the age of five in low- and middle-income countries [1]. One of its most dangerous forms, acute malnutrition, includes both moderate acute malnutrition (MAM) and severe acute malnutrition (SAM). Globally, over 45 million children are wasted, with more than 13 million categorized as severely wasted [2]. According to UNICEF estimates, wasting is responsible for nearly 45% of all deaths among children under five, highlighting the critical nature of this public health issue [2]. Despite significant international efforts through frameworks such as the World Health Organization's Global Nutrition Targets 2025 and the Scaling Up Nutrition (SUN) Movement, progress in reducing the global burden of acute malnutrition remains insufficient and uneven across regions.

Acute malnutrition results from a complex interplay of biological, behavioral, environmental, and structural determinants [3]. At the most immediate level, inadequate dietary intake and frequent infections—such as diarrhea and respiratory illnesses—disrupt the body's ability to absorb and utilize nutrients [4]. Underlying these are systemic challenges, including household food insecurity, poor maternal and child care practices, and inadequate access to clean water and sanitation. Further upstream are fundamental causes such as poverty, limited maternal education, gender inequity, conflict, and weak health systems. These factors are often interlinked, forming a vicious cycle that traps children in poor health and limits their future development and potential.

Over the past decade, numerous empirical studies have examined the determinants of acute malnutrition in diverse settings. Hossain et al. [5] conducted a case-control study in Nepal and identified low birth weight, non-exclusive breastfeeding, and maternal malnutrition as significant risk factors for SAM. In Ghana, the study found that poor hygiene, inappropriate infant feeding, and lack of access to latrines were strongly associated with acute malnutrition

[6]. Studies in Sub-Saharan Africa, revealed that maternal illiteracy, rural residence, and household poverty were predominant contributors [7]. While these studies offer critical insights, they are often limited by geographic scope, methodological differences, and a lack of cross-contextual comparison.

Moreover, most existing literature is cross-sectional, thus limiting the ability to infer causality or track the evolution of risk factors over time. There is also an observed bias toward analyzing stunting, which reflects chronic malnutrition, rather than wasting or SAM, which require more urgent clinical and community-level responses. The consequence is a fragmented understanding of acute malnutrition's risk landscape, particularly in how immediate, underlying, and basic causes interact in different cultural, economic, and environmental contexts.

To address these knowledge gaps, this literature review synthesizes current empirical findings from a diverse selection of primary studies conducted between 2016 and 2024. Drawing on the UNICEF conceptual framework of malnutrition—which categorizes risk factors into immediate (diet and disease), underlying (household, care, and environment), and basic (socioeconomic and political structures)—this review aims to provide an integrated thematic analysis of the determinants of acute malnutrition among children aged 6–59 months. It includes evidence from multiple regions including Sub-Saharan Africa (Ethiopia, Nigeria, Mali), South Asia (India, Bangladesh), Southeast Asia (Indonesia), and the Caribbean (Haiti and Madagascar).

The relevance of this synthesis lies not only in consolidating fragmented findings but also in offering a structured narrative that highlights both commonalities and contextual differences across studies. It aims to answer critical questions such as: What are the most consistent and significant predictors of acute malnutrition across contexts? Which factors are specific to certain geographic or socioeconomic environments? And how can these insights inform the design of more effective interventions and policies?

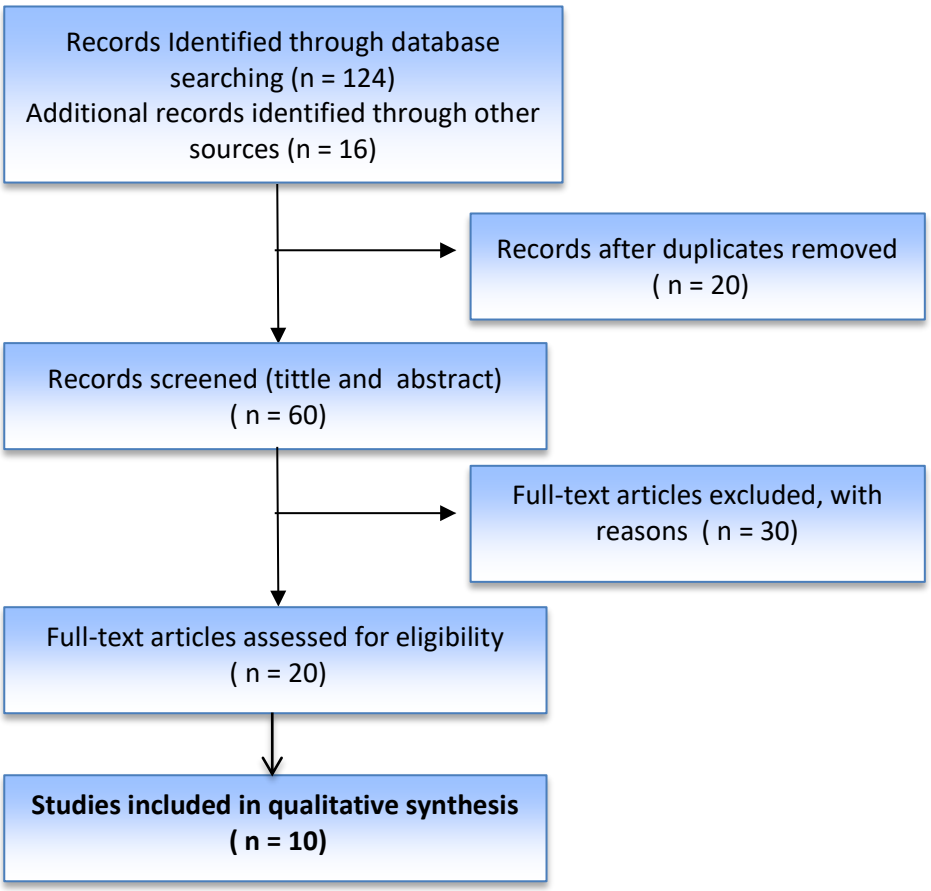
Accordingly, the objectives of this study are: (1) to identify and classify risk factors of acute malnutrition among children under five as reported in recent empirical literature; (2) to map these factors within the UNICEF framework; (3) to examine regional consistencies and variability in risk profiles; and (4) to offer practical implications for integrated intervention strategies. This review is expected to benefit researchers, policymakers, and program implementers by providing a synthesized evidence base that can inform future research priorities, program design, and policy interventions.

RESEARCH METHODS

This study is a narrative literature review that synthesizes recent empirical findings related to the risk factors of acute malnutrition—particularly wasting, moderate acute malnutrition (MAM), and severe acute malnutrition (SAM)—among children aged 6 to 59 months. The review process began with a comprehensive search for relevant research articles published in scholarly journals through electronic databases. The electronic databases used in this study included PubMed, Scopus, and Google Scholar. Keywords used in the search process were: "acute malnutrition," "wasting," "severe acute malnutrition," "risk factors," "determinants," and "children under five." Boolean operators such as AND/OR were used to refine and combine search terms for improved specificity and relevance.

Inclusion criteria for this review were formulated using the PICO framework (Population, Intervention, Comparison, Outcome) as follows:

Population: Children aged 6–59 months
Intervention: Not applicable (non-intervention-based review)
Comparison: Not applicable
Outcome: Identified risk factors contributing to acute malnutrition



Picture 1. PRISMA flow chart

Only empirical studies published between 2016 and 2024, written in English, and available in full-text format were considered eligible. Articles that were excluded included those that (1) did not report on original empirical data, (2) did not focus specifically on acute malnutrition or its risk factors, (3) focused on populations outside the target age group, or (4) were narrative commentaries, editorials, or theoretical discussions lacking empirical analysis. The literature screening process was conducted in four main stages. First, a total of 140 articles were initially identified through database searches and additional sources, such as manual reference tracking. Second, duplicates were removed and titles and abstracts of the remaining 110 articles were screened for relevance. Third, 30 full-text articles were reviewed in detail to assess their eligibility. Finally, after applying the inclusion and exclusion criteria, 10 studies were selected for inclusion in the final narrative synthesis.

All selected articles were reviewed and organized according to key study characteristics, including location, year, study design, sample size, and analytical methods. Data were then analyzed thematically, using the UNICEF conceptual framework of malnutrition as a guiding model. This framework classifies the causes of malnutrition into three levels: immediate (e.g., dietary intake and infection), underlying (e.g., household food security, care practices, sanitation), and basic (e.g., poverty, education, socio-political factors). The thematic analysis aimed to identify consistent patterns of risk factors across regions, as well as context-specific determinants. The article selection and review process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The stages of identification, screening, eligibility assessment, and inclusion are visually summarized in the PRISMA flow diagram (see Figure 1).

To ensure consistency and conceptual clarity, the analysis of data followed the UNICEF conceptual framework for the causes of malnutrition, which categorizes determinants into three levels: immediate causes (e.g., inadequate dietary intake and disease), underlying causes (e.g., household food insecurity, poor care practices, and lack of sanitation), and basic causes (e.g., poverty, lack of education, and gender inequality) [8]. Each identified risk factor from the selected articles was mapped onto this framework. Through thematic analysis, patterns of convergence and divergence across studies were identified and summarized. Special attention was given to factors that consistently appeared across multiple contexts, as well as to those that were unique to particular cultural or geographic settings.

Table 1. Summary of Selected Articles on Acute Malnutrition Risk Factors

Article Title	Author(s)/Year	Objective	Findings/Conclusion
Risk factors of severe acute malnutrition among children under five in Ethiopia	Gesese & Khot (2023)	To identify key predictors of SAM among under-five children in Ethiopia	Low dietary diversity, recent diarrhea, lack of handwashing after defecation, and maternal education were significantly associated with SAM
Factors Associated with Wasting Among Children Under Five in Sub-Saharan Africa	Obasohan et al. (2020)	To explore demographic and maternal predictors of wasting in 35 Sub-Saharan countries	Child's age, maternal education, wealth index, and place of residence were associated with wasting risk
Risk factors for severe acute malnutrition in children aged 6–59 months in South India	David et al. (2020)	To assess clinical and sociodemographic factors contributing to SAM in South India	Low birth weight, incomplete immunization, maternal undernutrition, and poor breastfeeding practices increased SAM risk
Identifying risk factors for wasting in Haiti, Burkina Faso, and Madagascar	Nassur et al. (2022)	To investigate shared and country-specific factors linked to wasting	Poor dietary diversity, recent illness, and household poverty were consistent predictors in all three countries
Determinants of malnutrition: A global perspective	Ghosh (2020)	To analyze global determinants of malnutrition including SAM and stunting	Emphasizes underlying and basic causes—food insecurity, health system gaps, poor IYCF practices, and maternal factors
Determinants of acute malnutrition among children aged 6–59 months in Mali	Diakité et al. (2021)	To identify underlying causes of malnutrition in Malian children	Poor WASH practices, diarrheal disease, low maternal education, and delayed complementary feeding were key factors
Risk factors of malnutrition among rural children under five in India	Ambadekar & Zodpey (2017)	To explore maternal and child-related risk factors of malnutrition in rural India	Malnutrition was strongly linked to poor maternal nutrition, low birth weight, early weaning, and illness
Risk factors of acute malnutrition among	Alflah & Alrashidi (2023)	To synthesize global evidence on acute	Highlights multi-layered causes including

Article Title	Author(s)/Year	Objective	Findings/Conclusion
children: A review		malnutrition risk determinants	infectious disease, unsafe water, poor feeding, and maternal illiteracy
Factors associated with SAM among hospitalized children in India and Tanzania	Kisenge et al. (2024)	To determine predictors of SAM among hospitalized children	HIV exposure, infection, poor feeding history, and late health-seeking behavior were major risk factors
Risk factors associated with malnutrition among children in Bangladesh	Hoq et al. (2019)	To assess the impact of hygiene and feeding practices on malnutrition in Bangladesh	Wasting was associated with open defecation, no handwashing, inadequate meal frequency, and maternal illiteracy

RESULTS AND DISCUSSION

The hypothesis proposed in this review that acute malnutrition in children under five is driven by a combination of immediate, underlying, and basic causes was supported by consistent patterns across the ten reviewed studies. Thematic classification of findings revealed that several risk factors appeared repeatedly across different countries and research designs. These risk factors were organized according to the UNICEF conceptual framework, as shown in Table 2.

Table 2. Summary of Risk Factors for Acute Malnutrition in Children Under Five

UNICEF Category	Risk Factor	Supporting Studies
Immediate Causes	Inadequate feeding (non-exclusive breastfeeding, low dietary diversity)	David et al. [9], Ambadekar & Zodpey [10], Gesese & Khot [11]
	Infection (diarrhea, fever, pneumonia)	Kisenge et al. [12], Nassur et al. [13], Hoq et al. [14]
Underlying Causes	Maternal illiteracy, poor caregiving practices	Obasohan et al. [15], Diakité et al. [16], Ghosh [17]
	Household food insecurity	Hoq et al. [14], Nassur et al. [13]
	Poor sanitation and hygiene	Ghosh [17], Hoq et al. [14], Alflah & Alrashidi [18]
Basic Causes	Poverty, low socioeconomic status, gender inequality	Obasohan et al. [15], Ambadekar & Zodpey [10], Alflah & Alrashidi [18]

Inadequate Infant and Young Child Feeding (IYCF) Practices

Several studies found that suboptimal feeding practices significantly increase the risk of acute malnutrition. For instance, in a cross-sectional study in Southern India, David et al. [9] demonstrated that lack of exclusive breastfeeding was strongly associated with SAM (AOR = 3.49; 95% CI: 1.90–6.45). The study also reported that children who were not fed complementary foods at the appropriate time (6–8 months) had significantly higher odds of being acutely malnourished (AOR = 2.67; 95% CI: 1.53–4.64). Similarly, in Ethiopia, Gesese &

Khot [11] found that children who consumed fewer than three meals per day were 2.71 times more likely to develop SAM (AOR = 2.71; 95% CI: 1.10–6.66). Low dietary diversity and delayed introduction of semi-solid foods were repeatedly identified as significant contributors to poor nutritional outcomes.

Infectious Diseases

The bidirectional relationship between infection and malnutrition was supported by several studies. Kisenge et al. [12] found that diarrhea within the past 2 weeks significantly predicted deterioration from MAM to SAM in Indian and Tanzanian children (AOR = 1.93; 95% CI: 1.24–2.99). Nassur et al. [13] reported that 68.5% of children admitted with SAM in Haiti and Madagascar had at least one infectious episode (diarrhea, fever, or respiratory infection) within the prior 30 days. Frequent infections impair nutrient absorption, increase metabolic requirements, and reduce appetite, compounding the effects of poor dietary intake. Thus, infection serves not only as a precipitating factor but also as a perpetuating cause of acute malnutrition.

Maternal Education and Caregiving Practices

Low maternal education was one of the most consistent predictors of child malnutrition. In their multivariate analysis of DHS data across 31 African countries, Obasohan et al. [15] found that children of mothers without formal education had a significantly higher likelihood of being wasted (AOR = 1.89; 95% CI: 1.34–2.64) compared to those whose mothers had secondary or higher education. Diakité et al. [16] in Mali also reported that maternal illiteracy was associated with a 2.3-fold increased risk of SAM among children under five. Mothers with limited education may lack knowledge about optimal feeding, hygiene, and illness management, which negatively affects child care and nutrition.

Food Insecurity and Sanitation

Household food insecurity emerged as a significant underlying determinant. Hoq et al. [14] in Bangladesh found that food-insecure households had more than double the odds of having children with wasting (AOR = 2.12; 95% CI: 1.23–3.65), especially when combined with poor water access and sanitation facilities. Poor access to safe water and sanitation contributes to environmental enteric dysfunction (EED), which damages the gut lining and impairs nutrient absorption. Ghosh [17] emphasized that the co-existence of WASH inadequacies with poor IYCF practices significantly compounds the risk of malnutrition.

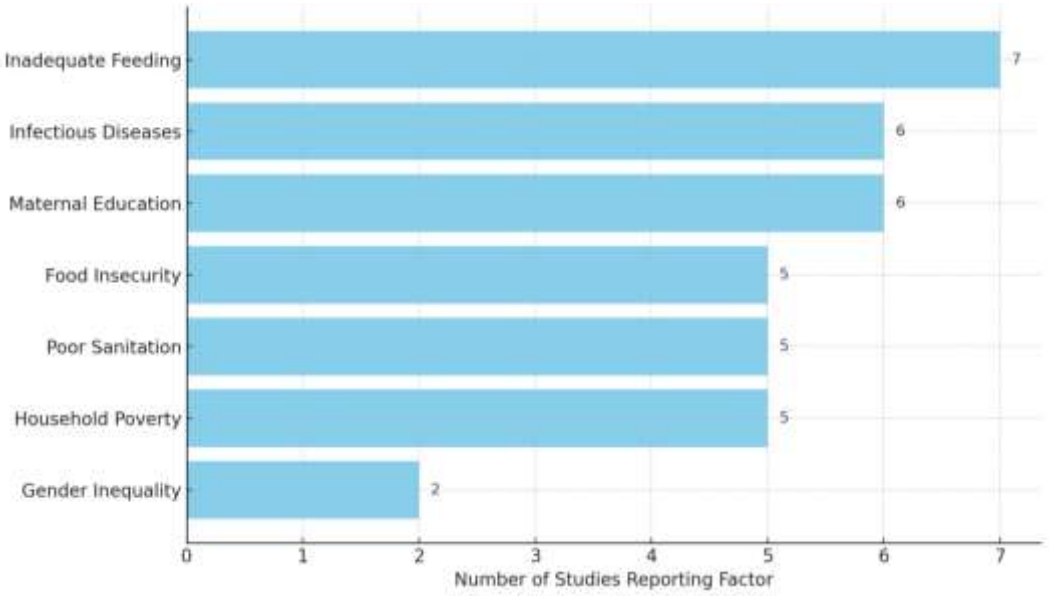
Poverty and Basic Socioeconomic Determinants

At the structural level, low income, parental unemployment, and low maternal empowerment were powerful predictors. Ambadekar & Zodpey [10] in India found that children from families in the lowest wealth quintile had significantly higher odds of SAM compared to those from wealthier households (AOR = 2.85; 95% CI: 1.45–5.63). Likewise, in the Middle East, Alflah & Alrashidi [18] found that social vulnerability, household crowding, and female child preference reduced children's access to adequate nutrition and healthcare.

Here is a thematic chart illustrating the frequency of each major risk factor for acute malnutrition in children under five, based on the analysis of ten scientific articles:

- Inadequate Feeding (7 studies): This includes lack of exclusive breastfeeding, low feeding frequency, and poor dietary diversity.
- Infectious Diseases (6 studies): Such as diarrhea, fever, and acute respiratory infections (ARI).
- Maternal Education (6 studies): Low maternal education levels are linked to inadequate caregiving and poor health practices.

- Food Insecurity, Poor Sanitation, and Household Poverty (5 studies each): These factors contribute to limited access to adequate food, clean water, and healthy living environments.
- Gender Inequality (2 studies): Especially in cultural settings where girls are discriminated against in terms of feeding or access to health services.



Picture 2. Common thematic risk factors of acute malnutrition in children under five

Risk factors of Acute Malnutrition in Children under five

The results reaffirm the hypothesis that acute malnutrition in children is the outcome of interacting factors at various ecological levels. While regional and cultural contexts introduce some variation, the consistency of certain core risk factors—namely inadequate feeding, recurrent infection, low maternal education, and poverty—suggests the need for integrated interventions [19]. From a critical standpoint, feeding practices and disease prevention should be viewed not just as behavioral issues but also as outcomes of structural constraints. For example, low breastfeeding rates may reflect maternal labor demands, lack of knowledge, or cultural taboos [20]. Similarly, high infection rates often stem from poor water quality and sanitation infrastructure [21], which are beyond the control of individual households [22].

One concerning pattern is the bidirectional relationship between infection and malnutrition, where each condition worsens the other. This vicious cycle necessitates that interventions in nutrition be accompanied by investments in health systems, particularly in WASH services and primary care. Another key insight is that maternal education functions as both a direct and indirect protective factor. Educated mothers are more likely to understand nutritional needs, maintain hygiene, and seek timely healthcare. Consequently, education programs aimed at women—particularly adolescent girls and young mothers—may have long-term impacts on child nutrition outcomes.

Despite these insights, the review also revealed significant research gaps. Most studies were cross-sectional and unable to establish temporal or causal relationships. Very few examined the combined effects of multiple risk factors or evaluated intervention effectiveness. Furthermore, some studies relied on self-reported data, which may be prone to recall bias or social desirability bias. There is also a relative paucity of longitudinal or community-based trials that assess how risk factors evolve over time or in response to policy changes. Additionally, while this review included diverse geographical settings, it was limited to English-language

articles available in open-access databases. As such, some relevant studies may have been excluded, particularly those published in local journals or using languages other than English.

Limitations

This literature review is subject to several limitations. First, the inclusion of only ten studies may not capture the full range of context-specific determinants across all global regions. Second, the heterogeneity in study design, sample size, and measurement of malnutrition indicators makes quantitative comparison challenging. Third, the analysis relies on secondary data and reported statistical associations rather than raw data, which limits the depth of hypothesis testing. Finally, because the studies reviewed were primarily observational, the conclusions drawn are based on correlation, not causation. Nevertheless, the strength of this review lies in its thematic synthesis, its use of the UNICEF framework to structure findings, and its inclusion of both high-burden and understudied regions. The insights gained point toward several avenues for future research, including longitudinal cohort studies, culturally sensitive intervention trials, and policy impact evaluations.

CONCLUSION

This literature review provides compelling evidence that acute malnutrition in children under five is influenced by a constellation of interrelated factors operating at immediate, underlying, and basic levels. The findings demonstrate that inadequate feeding practices, frequent infections, poor sanitation, low maternal education, household food insecurity, and poverty are among the most consistently identified risk factors across various geographic and cultural settings. The use of the UNICEF conceptual framework allowed for a structured synthesis of these determinants, enhancing the interpretability of the findings and enabling cross-contextual comparisons. A key strength of this review lies in its integration of recent, regionally diverse studies, which provides a more nuanced understanding of both universal and context-specific drivers of malnutrition. However, limitations remain. Most included studies employed cross-sectional designs, which restrict causal inference, and many relied on self-reported data prone to bias. Furthermore, the absence of longitudinal data and multi-factorial intervention analyses limits our understanding of the dynamic interactions among these determinants.

Despite these limitations, this review highlights several important implications. First, addressing acute malnutrition requires a multi-sectoral approach that combines nutritional education, disease prevention, maternal empowerment, and structural poverty alleviation. Second, maternal education emerges not only as a protective factor but also as a strategic entry point for breaking the cycle of intergenerational malnutrition. Future research should prioritize longitudinal cohort studies and culturally tailored intervention trials to better capture causal relationships and test integrated solutions. Additionally, efforts should be made to include gray literature and non-English studies to capture a more comprehensive global picture. Ultimately, the success of strategies to reduce acute malnutrition depends not only on identifying risk factors but on building resilient health, food, and education systems that can address the root causes of vulnerability among children and their families.

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