BMJ Open

Determinants of malnutrition among children under 5 years in refugee and internally displaced person populations: a protocol for systematic review and meta-analysis

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To cite: Win TZ, Kyaw MT, Smith C, *et al*. Determinants of malnutrition among children under 5 years in refugee and internally displaced person populations: a protocol for systematic review and meta-analysis. *BMJ Open* 2025;**15**:e099950. doi:10.1136/bmjopen-2025-099950

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2025-099950).

Received 29 January 2025
Accepted 11 August 2025

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ABSTRACT

Introduction Malnutrition is a critical global health issue, particularly among the vulnerable children whose socioeconomic, sociocultural and environmental characteristics are unique. Malnutrition significantly increases the risk of mortality and non-communicable diseases, impairs physical growth, hinders cognitive development and limits children's potential. While a number of earlier studies explored the determinants of malnutrition among children under 5 years of age in refugee and internally displaced person (IDP) populations, comprehensive reviews are scarce. A systematic synthesis of existing data is essential to better understand its prevalence and associated risk factors, informing more effective interventions.

Method and analysis This systematic review protocol follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. We will conduct a comprehensive search in PubMed, Scopus and ProQuest. Additionally, relevant grey literature will be explored using Google Scholar and Google Advanced Search. We will include cross-sectional, cohort and case-control studies published in English that report the prevalence of malnutrition and associated factors among children under 5 years of age in refugee and/or IDP populations. Two reviewers will screen and extract data independently. The quality of the included studies will be assessed using the Joanna Briggs Institute critical appraisal tool. Meta-analysis will estimate pooled prevalence of malnutrition, as well as the pooled OR for associated factors, using a random-effects model with 95% CIs. Heterogeneity will be assessed using the χ^2 test and I^2 value.

Ethics and dissemination Ethical approval is not required. The results will be published in a peer-review journal and presented at conferences.

PROSPERO registration number CRD42024611728.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The protocol adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.
⇒ A comprehensive search strategy has been developed to ensure all eligible studies meeting the inclusion criteria are included.
⇒ Study screening, selection, data extraction and risk of bias assessment will be conducted by two independent reviewers.
⇒ The study will assess the quality of the included studies.
⇒ Only studies published in English will be included.

INTRODUCTION

Malnutrition remains a critical global health challenge, particularly among children under 5 years of age. In 2022, an estimated 149 million children were stunted (too short for their age), and 45 million were wasted. Wasting reflects acute malnutrition, often caused by food shortages or infections, while stunting results from prolonged undernutrition linked to poor maternal health, inadequate feeding, low socioeconomic status and frequent illnesses.[1] In 2024, an estimated 35 million children under the age of five were overweight, a condition that arises from an imbalance between energy intake through diet and energy expenditure through physical activity.[2] Malnutrition not only increases the risk of mortality in young children but also hinders their physical growth, impairs cognitive development and increases the risk of non-communicable diseases, preventing them from achieving their full potential.[1–4]

The UNICEF conceptual framework categorises the causes of malnutrition into three levels: immediate, underlying and basic causes.[5] Immediate causes, such as inadequate dietary intake and diseases, directly impact nutritional status at the individual level. Underlying causes operate at the household level, including food security, maternal and childcare and healthy living

conditions, influencing nutrition through immediate factors. Basic causes are broader societal issues such as economic, cultural and political factors, impacting household access to essential resources.[5 6] In refugee and internally displaced person (IDP) settings, these issues are often exacerbated by the challenges of adapting to new, resource-limited environments, limited access to adequate and appropriate food and disruptions in healthcare services.[7 8]

The United Nations High Commissioner for Refugees (UNHCR) defines a refugee as 'someone who has been forced to flee his or her country because of persecution, war or violence. A refugee has a well-founded fear of persecution for various reasons of race, religion, nationality, political opinion or membership in a particular social group'.[9] An IDP, however, is defined as 'someone who has been forced to flee their home but never crosses an international border'.[9] As of June 2023, 110 million people worldwide were forcibly displaced due to conflicts and persecution. Seven major displacement situations accounted for 90% of new displacement, including crises in Afghanistan, Latin America and the Caribbean, Myanmar, Somalia, Sudan, the Democratic Republic of Congo and Ukraine.[10] From 2010 to 2023, the number of children displaced by conflict and violence worldwide more than doubled, rising from approximately 18.8 million to 47.2 million.[11]

Refugee camps are clusters of temporary shelters for refugees where UNHCR, host governments or non-governmental organisations frequently assist the residents' urgent requirements.[12] However, children living in refugee camps face a higher risk of malnutrition due to irregular access to foods, clean water, healthcare services and shelter.[13] Prevalence of malnutrition among refugees and internally displaced children is notably high, with prevalence of stunting reported at 34% in South East Asian Region, 32% in African Region and 14% in Eastern Mediterranean Region.[7] In Africa, the prevalence of acute malnutrition among refugees and internally displaced children ranges from 0.04% to 29.3%.[14] Additionally, the pooled prevalence of overweight among refugee children in South Asia is estimated at 6.5%.[15] Beyond limited access to essential services, sociocultural factors, including gender inequality, women's excessive workload, patriarchal norms and food taboos that limit women's and girls' access to nutrient-dense foods, could further exacerbate malnutrition.[16]

Although many earlier studies examined the prevalence of and risk factors for malnutrition among children under 5 years of age in refugee and IDP settings, a significant gap remains in the form of comprehensive reviews focusing specifically on determinants. For example, a recent systematic review on prevalence emphasised the need for further research evaluating determinants of malnutrition to inform effective interventions.[7] This gap highlights the need for a systematic synthesis of existing data to provide a deeper and more comprehensive understanding of the prevalence of malnutrition and its associated factors in these settings. To address this gap, our study aims to identify the prevalence and determinants of malnutrition among children under five in refugee and IDP contexts. By integrating findings from various studies, this review seeks to present an integrated perspective that can guide and enhance interventions targeting malnutrition in refugee and IDP contexts.

METHODS AND ANALYSIS

This systematic review will be carried out and documented in accordance with the guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).[17] This protocol follows the PRISMA-Protocols 2015 guidelines (see online supplemental appendix 1).[18] It has been registered in PROSPERO. We plan to begin the literature search and screening process in September 2025. The study is expected to be completed by the end of December 2025.

Eligibility criteria

Inclusion criteria

We will include all cross-sectional, cohort and case-control studies that reported the prevalence of malnutrition and their associated factors among children under 5 years of age, specifically within refugee or IDP populations, regardless of year. Only studies written in English will be considered.

Exclusion criteria

We will exclude intervention studies, reviews, studies that do not report the outcome of interest, articles lacking full text and data, qualitative studies and studies where the age group of children is not clearly defined.

Search strategies

A systematic search will be performed in PubMed, Scopus and ProQuest. Additionally, relevant grey literature including dissertations and reports from reputable sources such as UNHCR, UNICEF, WHO and World Food Program will be explored using Google Scholar and Google Advanced Search. Reference lists of the included studies will be reviewed to identify additional studies. The following search term will be used: ((malnutrition OR "nutritional deficiency" OR undernutrition OR undernourish* OR wasting OR stunting OR underweight OR overnutrition OR obese OR obesity OR overweight) AND (determinant OR predictor OR risk OR "associated factor") AND (refugee OR "internally displaced")). The full search strategy is available in online supplemental appendix 2.

Selection of studies

EndNote V.21 citation manager will be used to import studies from several sources and delete duplicates. Two authors (TZW and MTK) will independently screen the titles and abstracts of publications obtained by electronic searches to determine if they meet the inclusion criteria. Full-text review will be continued for the eligible studies.

The reasons for exclusions of studies will be recorded. Any disagreements will be resolved through discussion, with further consultation with a third coauthor if needed. The articles that met the inclusion criteria will be retained for data extraction. The selection process will be recorded in sufficient detail to complete a PRISMA flow chart.

Data extraction

Data extraction for the eligible full-text articles will be conducted independently by two authors (TZW and MTK). A prespecified data abstraction will be used to minimise conflicts during the extraction process. Any disagreements will be resolved through discussion, and if necessary, the original author of the paper will be contacted for clarification. The following information will be collected: the author, year, country, camp setting, camp name, phase of living in the camp, study design, sample size, age, gender, prevalence and associated factors (adjusted OR) with CI for the variables).

Quality assessment

Two authors (TZW and MTK) will independently assess the quality of the included studies using the Joanna Briggs Institute critical appraisal tool.[19] The checklist generates a score ranging from 0 to 8, with 1 point awarded for each question answered as 'yes' and 0 points for responses of 'no,' 'unclear' or 'not applicable.' Although no validated cut-off points exist, a score of 8 indicates high quality, while a score of 0 indicates low quality. Any discrepancies in the quality assessment will be resolved through consultation with a third author. No studies will be excluded based solely on their methodological quality assessment.

Statistical analysis and data synthesis

The extracted data through Microsoft Excel will be exported to STATA software (V.18) for analysis. The characteristics of the included studies will be summarised in tables and narrative text. Meta-analysis will be performed using a random-effects model to estimate the pooled prevalence of wasting, underweight, stunting and overweight, as well as the pooled OR of their associated factors, with a 95% CI. The results will be presented as forest plots. We will assess heterogeneity using the χ^2 test, and the degree of heterogeneity will be determined by the I^2 value. If significant differences among the studies are found ($I^2 > 75\%$) and there are enough trials, we will investigate potential reasons by analysing subgroups.[20] These subgroups might include countries, year, population types (such as refugees vs IDPs) and study type. Publication bias will be visually evaluated using a funnel plot if more than 10 studies are included.[21]

Ethics and dissemination

Ethics approval is not required for this study as no original data will be collected. The findings will be disseminated through peer-reviewed journal publications and presentations at academic conferences.

Contributors TZW and HA designed the protocol. TZW drafted the protocol and designed the search strategy. MTK checked the draft. HA, YK and CS provided critical appraisal regarding the design of the systematic review. TZW, MTK and HA revised the protocol. All authors read and approved the final version of the protocol. TZW is the guarantor. I have used ChatGPT for English grammar checking and paraphrasing, as I am not a native English speaker.

Funding This work was supported by the School of Tropical Medicine and Global Health, Nagasaki University, Japan. The funder didn't influence the results/outcomes of the study despite authors' affiliations with the funder.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

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