

## Double Burden of Malnutrition among Children under Five in Sub-Saharan Africa and Other Least Developed Countries: A Systematic Review

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**Abstract :** Background: Concerns regarding malnutrition have evolved from focusing solely on single forms to addressing the simultaneous occurrence of multiple types, commonly referred to as the double or triple burden of malnutrition. Nevertheless, data concerning the concurrent occurrence of various types of malnutrition are scarce. Therefore, this systematic review and meta-analysis aims to assess the pooled prevalence of the double burden of malnutrition among children under five in Sub-Saharan Africa and other least-developed countries (LDCs). Methods: Electronic, web-based searches were conducted from January 15 to June 28, 2023, across several databases, including PubMed, Embase, Google Scholar, and the World Health Organization's Hinari portal, as well as other search engines, to identify primary studies published up to June 28, 2023. Laboratory-based cross-sectional studies on children under the age of five were included. Two independent authors assessed the risk of bias and the quality of the identified articles. The primary outcomes of this study were micronutrient deficiencies and the comorbidity of stunting and anemia, as well as wasting and anemia. The random-effects model was utilized for analysis. The association of identified variables with the various forms of malnutrition was also assessed using adjusted odds ratios (AOR) with a 95% confidence interval (CI). This review was registered in PROSPERO with the reference number CRD42023409483. Findings: The electronic search generated 6,087 articles, 93 of which matched the inclusion criteria for the final meta-analysis. Micronutrient deficiencies were prevalent among children under five in Sub-Saharan Africa and other LDCs, with rates ranging from 16.63% among 25,169 participants for vitamin A deficiency to 50.90% among 3,936 participants for iodine deficiency. Iron deficiency anemia affected 20.56% of the 63,121 participants. The combined prevalence of wasting anemia and stunting anemia was 5.41% among 64,709 participants and 19.98% among 66,016 participants, respectively. Both stunting and vitamin A supplementation were associated with vitamin A and iron deficiencies, with adjusted odds ratios (AOR) of 1.54 (95% CI: 1.01, 2.37) and 1.37 (95% CI: 1.21, 1.55), respectively. Interpretation: The prevalence of the double burden of malnutrition among children under the age of five was notably high in Sub-Saharan Africa and other LDCs. These findings indicate a need for increased attention and a focus on understanding the factors influencing this double burden of malnutrition.

**Keywords :** children, Sub-Saharan Africa, least developed countries, double burden of malnutrition, systematic review, meta-analysis

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