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Review Article

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Addressing malnutrition in Nigeria: a narrative review of causes, impacts, and pathways to nutritional resilience

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Abstract

***Background & Aims*:** Malnutrition remains one of the most pressing public health challenges in Africa, disproportionately affecting women and children. This dual burden of malnutrition, undernutrition, characterized by stunting, wasting, and micronutrient deficiencies, alongside overnutrition and its associated non-communicable diseases, compromises health and economic stability, particularly in sub-Saharan Africa. In Nigeria, malnutrition contributes to over 33% of under-five deaths annually, with stunting rates exceeding 50% in northern geopolitical zones.

***Materials & Methods*:** This study utilizes a narrative review approach to explore the underlying causes of malnutrition, including food insecurity, climate change, health challenges, poverty, and cultural practices, while also assessing intervention strategies.

***Results*:** Nearly 45% of Nigeria's population experiences food insecurity, with rural communities disproportionately affected. Economic instability, conflicts, and environmental challenges in many parts of Nigeria further perpetuate cycles of poverty and food insecurity. Findings underscore the urgent need for climate-responsive policies, integrated disease prevention, and maternal education to mitigate the multifaceted impact of malnutrition. The study advocates for localized approaches to achieve long-term nutritional resilience.

***Conclusion*:** Malnutrition in Nigeria is a complex, multidimensional issue requiring urgent attention. Sustainable solutions must be driven by local resources, knowledge, and innovation.

***Keywords*:** Community-based nutrition interventions, Food security, Malnutrition, Nutrition interventions, Nutrition policy

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Introduction

Millions of lives are impacted by malnutrition, which remains one of Africa's most pressing public health challenges, particularly for women and children (1). Despite international intervention efforts, sub-Saharan Africa continues to grapple with the dual burden of undernutrition and overnutrition, posing significant public health risks. Undernutrition is often manifested as stunting (low height for age), wasting (low weight for height), and micronutrient deficiencies, while overnutrition contributes to rising obesity rates and non-communicable diseases (NCDs) (2). These dual challenges threaten both the health and economic stability of nations, particularly in sub-Saharan Africa. In Nigeria, malnutrition is responsible for over 33% of deaths among children under five annually, with the

highest mortality rates observed in the northern geopolitical zones (NGZs), where nearly 50% of children under five are stunted (3). This alarming statistic highlights the severity of the nutritional crisis in the country. Stunting, a marker of chronic malnutrition, reflects long-term inadequate nutrient intake, poor feeding practices, and suboptimal living conditions (4).

Although global poverty rates have declined significantly over the past few decades, child malnutrition persists, largely due to weak health systems, limited access to nutritious food, and socio-cultural factors (5). The persistence of malnutrition is stark: in 2017, over 50 million children globally suffered from acute malnutrition (wasting), while 150 million were affected by chronic malnutrition (stunting) (6). The underlying determinants of malnutrition remain poorly understood, with significant gaps in data related to local, temporal, and environmental factors (7).

Nigeria is among the 20 countries that account for 80% of global malnutrition cases (8). Two primary types of malnutrition prevail among Nigerian children: protein-energy malnutrition (PEM) and micronutrient deficiencies. Protein-energy malnutrition manifests in conditions such as kwashiorkor and marasmus, while micronutrient deficiencies, including deficiencies in vitamins A, D, and iron, are widespread (9). These conditions severely impair children's cognitive development and immune system function, increasing their vulnerability to diseases and mortality (9).

The interplay between malnutrition and poverty further exacerbates the problem. Poverty restricts access to diverse and nutritious food, perpetuates poor health outcomes, and contributes to a vicious cycle of malnutrition and economic hardship (10). Climate change compounds the issue by disrupting agricultural systems, reducing food availability, and increasing food insecurity in vulnerable communities (11). Additionally, inadequate maternal education and gender inequality remain critical barriers to improving child nutrition (12), as they influence feeding practices and access to health resources.

Addressing malnutrition (Table 1) in Nigeria requires a multi-faceted approach that includes developing and scaling up innovative solutions to tackle its root causes. A thorough understanding of the local context, combined with evidence-based strategies, is essential for achieving sustainable improvements in nutritional outcomes and breaking the cycle of malnutrition for future generations. This review examines the causes, impacts, and pathways to resilience in Nigeria.

Table 1. Summarized causes of malnutrition in Nigeria

Key causes	Supporting points	Cited studies
Food insecurity and climate change	i. Nearly 45% of Nigerians experience food insecurity, with rural areas disproportionately affected. ii. Climate change exacerbates food insecurity through erratic rainfall, rising temperatures, and reduced crop yields. iii. Rural communities reliant on subsistence farming are particularly vulnerable.	13, 14, 6, 15
Health challenges and disease	i. Poor health weakens immunity, exacerbating malnutrition, particularly in children. ii. Diarrhea, respiratory infections, and malaria are leading contributors. iii. Malaria increases nutrient depletion, especially iron, worsening growth and stunting. iv. Maternal health and nutrition influence child malnutrition.	16, 17, 18, 19
Poverty and inequality	i. Poverty limits access to food, healthcare, and education. ii. Rural populations and conflict-prone areas face greater challenges in accessing resources.	20, 21, 22, 14

Key causes	Supporting points	Cited studies
	iii. Displacement disrupts agricultural livelihoods, leading to food insecurity. iv. Urban-rural disparities exacerbate malnutrition.	
Cultural practices and beliefs	i. Harmful weaning practices delay the introduction of complementary foods. ii. Cultural food taboos restrict access to nutrient-rich diets. iii. Maternal education reduces malnutrition risk by promoting better feeding practices. iv. Community leaders and traditional healers influence dietary habits.	23, 24, 25, 26

Materials & Methods

This narrative review with systematic search elements explores the multifaceted issue of malnutrition in Nigeria, focusing on both low-income undernutrition and urban overnutrition trends. A systematic search of the literature was conducted using electronic databases, including PubMed, Scopus, Web of Science, Google Scholar, and the Cochrane Library, to ensure a comprehensive review of relevant studies.

The search focused on studies published between 2016 and 2024 and used Nigeria-specific keywords such as "malnutrition Nigeria," "climate change Nigeria," "food security," "health challenges," "cultural practices," and "nutrition interventions." The review prioritized data on under-five children, maternal nutrition, food security trends, and intervention effectiveness in northern Nigeria, where malnutrition rates are highest.

Inclusion and Exclusion Criteria

Inclusion Criteria

Studies addressing stunting, wasting, micronutrient deficiencies, overnutrition, or obesity trends in Nigeria, particularly among under-five children, pregnant women, and low-income populations.

Exclusion criteria

Non-English studies, studies published before 2016, and research focusing on non-Nigerian populations.

Selection Process and Data Extraction

Titles and abstracts were screened for relevance, followed by a full-text review and quality assessment to ensure reliability. Key data, including stunting prevalence, mortality rates, intervention outcomes, and policy impacts, were extracted into a predefined data sheet. A total of 89 studies met the inclusion criteria and were included in the final review.

Synthesis and Analysis

A thematic analysis was conducted to synthesize findings on prevalence, causes, and intervention efficacy. Trends in food insecurity, climate-related malnutrition, health challenges, poverty, and socio-cultural influences were analyzed to identify gaps and policy-relevant insights.

Results and Discussion

Causes of Malnutrition in Nigeria

Food Insecurity and Climate Change

Food insecurity is one of the most significant contributors to malnutrition in Nigeria, where many individuals and families struggle to access adequate and nutritious food (13, 27). According to the 2017 Food Security Report by the Food and Agriculture Organization (FAO), nearly 45% of Nigeria's population experiences food insecurity, with rural communities disproportionately affected (14). Food insecurity in Nigeria stems from poverty but is further exacerbated by socio-economic inequalities, inadequate infrastructure, and environmental challenges (28). Climate change is a major environmental factor impacting food security, leading to erratic rainfall patterns, rising temperatures, and shifting agricultural zones, all of which significantly affect food production and availability. For instance, unpredictable weather patterns reduce crop yields, disrupt harvest timing, and lead to food shortages (29). These disruptions in agricultural productivity limit access to nutritious food, particularly for vulnerable populations in rural areas, intensifying malnutrition rates.

A study by Sandler et al. (6) analyzed data from the Demographic and Health Surveys (DHS) of Kenya and Nigeria, combined with geospatial climate data, to assess the relationship between climatic variables and malnutrition rates. The study found that climate-related factors such as temperature, precipitation, and vegetation accounted for approximately 28-36% of the variation in malnutrition outcomes. Malnutrition outcomes like stunting were closely linked to changes in climate, as these factors influence food availability and access. The study also identified socioeconomic status and healthcare access as critical determinants of stunting rates, while family wealth and maternal education were the most significant factors influencing wasting. This research underscores the importance of considering climate variables in designing effective nutrition interventions.

In rural regions where agricultural dependency is highest, the impacts of climate change are even more pronounced. A report by Van Duard et al. (15) highlighted that rural communities are particularly vulnerable to rising temperatures and changing rainfall patterns. These areas tend to be heavily reliant on subsistence farming, and any fluctuations in weather patterns can disrupt the local food supply. As such, rural children, who depend on locally grown food sources, are more susceptible to malnutrition as food availability becomes unpredictable. Moreover, farmers in these regions often lack access to technologies or practices that could help mitigate the adverse effects of climate change, further exacerbating food insecurity. The findings from these studies point to an urgent need for the development of climate-sensitive nutrition policies. Such policies must not only focus on immediate food security needs but also address long-term resilience strategies to cope with environmental changes. Incorporating climate adaptation and mitigation strategies into national food security plans will be critical for preventing further malnutrition in Nigeria.

Health Challenges and Disease

In addition to food insecurity and climate change, health-related factors play a crucial role in exacerbating malnutrition (30). The cyclical relationship between poor health and malnutrition is particularly evident in children, who are more likely to experience frequent infections due to their weakened immune systems (31). Illnesses such as diarrhea, respiratory infections, and malaria are prevalent in Nigeria and contribute to the deterioration of nutritional status. These diseases not only reduce food intake and absorption but also increase nutrient loss through fever and other metabolic responses (16). Diarrheal diseases, which are among the leading causes of death in Nigerian children, are particularly linked to undernutrition. The frequent loss of fluids and electrolytes from diarrhea leads to dehydration, making children more susceptible to other infections, further worsening their nutritional status. In a study by Van der Kam et al. (17), researchers evaluated the effectiveness of ready-to-use therapeutic foods (RUTF) and micronutrient supplementation in improving the nutritional status of children suffering from illness. Despite providing nutritional supplements, the study found no significant reduction in malnutrition rates, likely because the duration of supplementation was inadequate and the children's high frequency of morbidity compromised the benefits of supplementation. The study concluded that comprehensive, long-term interventions were required to effectively combat malnutrition, particularly in children suffering from frequent infections.

Additionally, malaria remains a major contributor to child malnutrition in Nigeria. It has been linked to poor growth and stunting, as repeated episodes of malaria result in nutrient depletion and overall poor health (32). Malaria increases the metabolic demand for nutrients, including iron, leading to iron deficiency anemia, which further impairs children's immune systems and their ability to recover from illness (18). The relationship between malaria and malnutrition highlights the need for integrated approaches to combating both disease and nutritional deficiencies simultaneously. The high prevalence of these diseases in Nigeria suggests that improving access to clean water, sanitation, and health services is crucial to addressing malnutrition. Moreover, effective disease control measures, such as vaccination programs and malaria prevention strategies, must be

combined with nutrition interventions to break the cycle of illness and malnutrition. Studies have indicated that children's nutritional status is also influenced by maternal health and nutrition (19, 33). Poor maternal health, especially during pregnancy, increases the risk of delivering underweight children who are more prone to malnutrition. Maternal infections, undernutrition, and inadequate antenatal care further contribute to the risk of childhood malnutrition (34, 35). Thus, enhancing maternal nutrition and healthcare during pregnancy and infancy should be a key priority in efforts to reduce malnutrition in Nigeria. Health challenges, particularly infectious diseases, are crucial drivers of malnutrition in Nigeria. Addressing malnutrition requires comprehensive approaches that include not only nutritional interventions but also improved healthcare access, sanitation, and disease prevention programs. The interconnectedness of health and nutrition emphasizes the need for multi-dimensional strategies to tackle the root causes of malnutrition in Nigeria.

Poverty and Inequality

Poverty remains one of the most critical drivers of malnutrition in Nigeria and across sub-Saharan Africa. According to the United Nations Development Programme (UNDP), 22 out of the 24 nations categorized under the "Low Human Development" index are located in sub-Saharan Africa, highlighting the region's widespread poverty and its impact on human development outcomes, including nutrition (36). In 2016, over 200 million people in the region were undernourished, with poverty significantly exacerbating food insecurity and malnutrition rates (14). Poverty not only limits individuals' access to food but also restricts access to essential services such as healthcare, clean water, and education (37, 38), which are crucial in the prevention and treatment of malnutrition. The relationship between poverty and malnutrition is complex and interlinked with other socioeconomic factors, including inequality (5). Economic instability, conflicts, and environmental challenges in many parts of Nigeria further perpetuate cycles of poverty and food insecurity. In rural areas, the majority of the population relies on subsistence farming, which is highly vulnerable to environmental shocks such as droughts and floods. Without a reliable income source, families struggle to afford a diverse, nutrient-rich diet, often relying on cheaper, calorie-dense but nutrient-poor foods (39). This dependency on low-cost, low-nutrient food contributes to the high rates of undernutrition and micronutrient deficiencies, particularly in children.

The economic gap between urban and rural areas also exacerbates malnutrition in Nigeria (40). While urban populations may have better access to food markets, healthcare, and education, rural populations, particularly in the northern and southeastern regions, often face significant barriers to accessing essential services due to poor infrastructure, high poverty rates, and the absence of social safety nets (20, 41). This inequality in resource distribution results in poorer health outcomes, as those in rural areas are less likely to receive adequate nutrition and healthcare, making them more vulnerable to malnutrition. In conflict-prone areas, such as Northern Nigeria, poverty and inequality are further compounded by displacement and insecurity (21, 42, 43). Displaced families are often forced to leave their homes, farms, and livelihoods, which exacerbates food insecurity. As Musa et al. (22) reported, conflict leads to the destruction of agricultural infrastructure, reduces food production, and disrupts supply chains, which increases the cost of food and limits its availability. Displaced populations are also more likely to suffer from poor access to healthcare and education, which are essential in addressing malnutrition. Malnutrition rates among internally displaced persons (IDPs) in Nigeria have been particularly alarming, with children being the most vulnerable group. The World Food Programme (WFP) estimates that over 2.2 million children in northeastern Nigeria are acutely malnourished due to ongoing conflicts, displacement, and food insecurity.

In regions where conflict and displacement are prevalent, social structures that traditionally support food distribution and care for vulnerable groups, such as extended families, are often disrupted. This lack of community support networks intensifies the nutritional vulnerability of affected populations, leading to higher rates of stunting, wasting, and micronutrient

deficiencies (14). Addressing these challenges requires multi-dimensional interventions that include peace-building efforts, humanitarian aid, and long-term development programs aimed at reducing poverty and inequality.

Cultural Practices and Beliefs

Cultural beliefs and practices also significantly influence nutrition and feeding patterns in Nigeria, particularly in rural and traditional communities (44). Many cultural practices, although deeply rooted in social traditions, can inadvertently contribute to poor nutrition outcomes (45, 46). For example, certain weaning practices may delay the introduction of complementary foods or may involve the use of foods that lack the necessary nutrients for a child's growth and development (23, 47, 48). In some Nigerian cultures, mothers are advised to wait until children reach a certain age before introducing solid foods, believing that early weaning could cause harm (49, 50, 51). These practices may lead to malnutrition, especially in the absence of exclusive breastfeeding, which provides essential nutrients in the first 6 months of life. Some families offer children foods that are culturally perceived as sufficient, even though they lack adequate nutrition. These include starchy foods such as pounded yam, rice, or cassava, which are calorie-dense but low in essential vitamins and minerals. The belief that these foods are "good enough" for children is common in some communities, but it overlooks the nutritional deficiencies that can arise from such a diet (24). Studies have shown that inadequate child feeding practices, driven by cultural beliefs, contribute to high rates of malnutrition, particularly stunting and underweight in children under 5 years of age (52, 53, 54).

A key factor influencing these feeding practices is maternal education. Smith et al. (24) found that educated mothers are more likely to be aware of the importance of early childhood nutrition and to engage in feeding practices that promote better health outcomes. Educated mothers are more likely to recognize the signs of malnutrition and seek appropriate medical or nutritional interventions (55). This explains the importance of maternal education in improving child nutrition. In communities where educational levels are low, there is a greater risk of cultural misconceptions influencing feeding practices, which perpetuates cycles of malnutrition (25). Traditional beliefs about food preparation and food taboos can restrict children's access to diverse diets (56). For instance, some cultural beliefs prohibit the consumption of certain foods, such as animal protein or vegetables, which are crucial for child growth and development. These taboos often lead to nutrient imbalances in children's diets, contributing to malnutrition (57). In such cases, targeted nutrition education programs that involve community leaders and healthcare providers can help modify these harmful cultural practices (58). In the Northern regions, certain food taboos limit the intake of essential nutrients for pregnant women and young children, contributing to high rates of maternal and child malnutrition (59). In contrast, in the Southern regions, the emphasis on exclusive breastfeeding practices varies, and some communities may delay breastfeeding initiation due to traditional beliefs about colostrum (60). These cultural beliefs, while varying, often act as barriers to proper nutrition, and overcoming them requires understanding regional customs and working with local leaders (61). Traditional healers and community leaders play a vital role in shaping nutrition-related behaviors. These influential figures can either perpetuate harmful practices or act as advocates for nutritional change (62). Their involvement in promoting balanced diets and nutritional education could be crucial in altering detrimental cultural practices (63). Working closely with these leaders to integrate modern nutrition education with traditional practices could lead to more effective, culturally sensitive interventions (26).

To address these cultural barriers to nutrition, it is crucial to promote community-based nutrition interventions that incorporate local traditions and practices while encouraging more scientifically sound feeding practices. Social and behavior change communication (SBCC) strategies have been effective in other parts of the world and can be adapted to the Nigerian context to educate mothers and caregivers about the benefits of early and exclusive breastfeeding,

proper complementary feeding, and balanced diets for children.

Strategic policy actions to combat malnutrition and climate-linked food insecurity in Nigeria

Poverty Mitigation through Cash Transfers and Education

Interventions targeting poverty alleviation, such as cash transfer programs, combined with educating mothers from low socioeconomic backgrounds on the benefits of gender-neutral supplementary feeding, could substantially reduce stunting across all age groups in Nigeria's vulnerable zones (NGZs). Empowering mothers with knowledge on the timely introduction of complementary foods and appropriate feeding practices, alongside financial support, can enhance household food security, improve child nutrition, and reduce long-term malnutrition.

Integrated Approach to Disease Prevention and Malnutrition Treatment

A more comprehensive approach that integrates the prevention and treatment of diseases with the management of moderate malnutrition, rather than focusing solely on nutritional supplementation, might be more effective in reducing acute malnutrition in ill children. This approach should include early detection and treatment of underlying infections, vaccination programs, and targeted nutritional interventions to ensure that malnourished children receive holistic care that addresses both the root causes and symptoms of malnutrition.

Prioritizing Climate-Responsive Nutrition and Agricultural Policies

Nigeria must prioritize the integration of national nutrition, agricultural, and climate policies to address the interlinked challenges of climate change and malnutrition. This requires uncoupling feedback loops within food systems, where climate-related disruptions impact agricultural productivity, food availability, and nutritional outcomes. Policy frameworks must adopt climate-resilient agricultural practices, support sustainable food systems, and ensure that nutrition is a key consideration in climate adaptation strategies, particularly for vulnerable populations.

Enhancing Female Education for Improved Child Nutrition

Given the strong link between maternal education and child nutrition, urgent interventions focused on female education are essential for reducing child malnutrition. This is especially critical for achieving Sustainable Development Goal 2.2 on ending malnutrition by 2030. Empowering women with knowledge about nutrition, health, and child development will lead to more informed decisions about feeding practices and better care for their children, contributing to the broader goal of eradicating malnutrition across Nigeria.

Targeting Rural Areas and Less-Educated Mothers

Special attention must be given to rural areas and less-educated mothers, as they are disproportionately affected by undernutrition and the consequences of malaria. Tailored strategies, including community-based nutrition programs, should be developed to address the specific needs of these populations. This could involve outreach programs, mobile health services, and localized nutrition education initiatives that target the root causes of undernutrition in these vulnerable communities.

Table 2. Mitigation strategies, call to actions and their expected outcomes

Strategy	Call to actions	Expected outcomes
Poverty mitigation through cash transfers and education	i. Implement cash transfer programs. ii. Educate mothers on gender-neutral supplementary feeding and complementary foods.	i.Reduction in stunting across all age groups. ii.Enhanced household food security. i.Improved child nutrition.
Integrated approach to disease prevention and malnutrition treatment	i.Early detection and treatment of infections. ii.Vaccination programs.	i.Reduction in acute malnutrition.

Strategy	Call to actions	Expected outcomes
	ii.Targeted nutritional interventions.	ii.Holistic care for malnourished children. ii.Lower disease burden
Prioritizing climate-responsive nutrition and agricultural policies	i.Develop climate-resilient food production techniques, ii.Promote drought-resistant crops, and support sustainable agriculture.	i.Reduced impact of climate disruptions on food security. ii.Improved nutritional outcomes for vulnerable populations.
Enhancing female education for improved child nutrition	i.Promote female education. ii.Empower women with knowledge about nutrition and child development.	i.Better feeding practices. ii.Reduction in child malnutrition. ii.Progress toward SDG 2.2 (end malnutrition).
Targeting rural areas and less-educated mothers	i.Develop community-based nutrition programs. ii.Provide mobile health services and outreach programs. ii.Deliver localized nutrition education	i.Address root causes of undernutrition. ii.Improved health outcomes for rural populations.
Localized interventions for nutritional improvement	i.Focus on high-burden regions. ii.Implement localized dietary supplementation and health services. ii.Conduct nutrition education campaigns.	i.Reduced prevalence of stunting and wasting. ii.Improved nutritional status of under-five children.
Climate-friendly policies to combat malnutrition	i.Promote drought-resistant crops and agroforestry. ii.Integrate climate adaptation strategies into nutrition programs. v.Encourage community-led initiatives blending traditional and modern practices.	i.Sustained food security despite climate uncertainties. ii.Minimized malnutrition linked to climate change.

Localized Interventions for Nutritional Improvement

Anthropometric failure, such as stunting and wasting, remains highly prevalent in Nigeria, with significant spatial variation. Therefore, localized interventions are critical to improving the nutritional status of children under-five. National programs should adopt a more geographically focused approach, ensuring that high-burden regions receive targeted interventions. These efforts should include localized dietary supplementation, nutrition education campaigns, and improved access to health services to ensure that underserved areas are not overlooked.

Climate-Friendly Policies to Combat Malnutrition

The findings of this review highlight the urgent need for climate-friendly policies aimed at mitigating the long-term effects of climate change on malnutrition. Without the implementation of such policies, Nigeria risks reversing years of progress in reducing child malnutrition. These policies should focus on reducing the impact of climate-induced disruptions on food security, improving climate-resilient agricultural systems, and promoting sustainable food production practices. Climate adaptation strategies should be integrated into national nutrition programs to ensure that both short-term and long-term nutritional needs are met, even in the face of climate uncertainties. To address the impacts of climate change on food security, policy efforts should prioritize the adoption of climate-resilient agricultural practices such as drought-resistant crop varieties and agroforestry. Community-led initiatives that blend indigenous knowledge with modern agricultural techniques could help mitigate the adverse effects of climate change on nutrition. Successful case

studies, such as Kenya's agroecology programs or Ethiopia's watershed management projects, offer valuable insights that can be adapted to Nigeria's unique agricultural landscape."

Limitations of the Narrative Review

While this review provides a comprehensive analysis of malnutrition in Nigeria, several limitations should be acknowledged. First, data gaps remain a significant challenge, particularly in rural areas where surveillance systems are weak. Study quality varied, with some research lacking rigorous methodologies or large sample sizes. Publication bias may have influenced the findings, as studies with negative or inconclusive results are less frequently published. Additionally, some studies were student theses and unpublished, and thus were not included in this review. Future research should focus on longitudinal studies and region-specific interventions to strengthen the evidence base for policy-making.

Conclusion

Persistent food insecurity, health challenges, poverty, and cultural practices continue to overwhelm existing interventions, necessitating broader, multi-sectoral strategies to combat malnutrition effectively. Addressing these challenges requires prioritizing climate-resilient agriculture and female education, as these interventions can drive sustainable, long-term improvements in nutritional outcomes. The government must fund and implement policies, while communities play a role in local program execution, and agencies like UNICEF provide technical expertise and support. However, the success of these efforts depends on overcoming data gaps, cultural resistance, and policy implementation barriers, highlighting the need for further research and continuous program evaluation. Implementing solutions driven by local resources that sustainably reduce malnutrition will require collaboration across sectors to ensure lasting improvements in food security and healthcare.

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Ethical statement

This study is a narrative review based on secondary data obtained from publicly available sources, including peer-reviewed journal articles, national reports, and organizational publications. No human subjects or animal research was involved; therefore, ethical approval was not required. All studies included in the review were previously approved by relevant ethical bodies, and appropriate citations have been provided to acknowledge original sources and uphold academic integrity.

Data availability

All data supporting the findings of this study are derived from published literature and are openly accessible through academic databases such as PubMed, Scopus, Web of Science, Google Scholar, and the Cochrane Library. A complete list of references is included in the manuscript. Additional datasets used or analyzed during the review process are available from the corresponding author upon reasonable request.

Conflict of interest

The authors declare no conflict of interest regarding the publication of this paper. The views expressed in this paper are those of the authors and do not necessarily reflect the official policy or position of any institution or organization with which they are affiliated.

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Author contributions

Jumoke Georgina Ilo and Olariike Oyindasola Kayode were responsible for the conception and design of the study. Taiwo Mary Jacob, Rukayat Odunola Lawal and Boluwatife Oluwaseun Oduntan were responsible for the literature search and review. Jumoke Georgina Ilo drafted the manuscript and all the authors proofread. All authors have read and approved the manuscript.

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