



Nutrition Education: Improving Student Health in Nigeria

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Abstract

Malnutrition and poor dietary habits pose significant public health challenges among students in Nigeria, adversely affecting their health, cognitive development, and academic performance. This paper comprehensively analyzes and demonstrates the critical role of nutrition education as a fundamental and cost-effective intervention strategy to mitigate these pervasive issues. The main objective is to explore how effective nutrition education can lead to tangible improvements in students' dietary practices, nutritional status, and overall health outcomes. We delve into current nutritional challenges prevalent in Nigerian schools, examine the direct link between proper nutrition and enhanced learning capabilities, and discuss various effective strategies for delivering nutrition education tailored to local contexts. Furthermore, the paper highlights the necessity of collaborative efforts among stakeholders and considers cultural factors for successful implementation. The ultimate conclusion underscores that integrating well-designed, context-specific nutrition education into Nigeria's educational framework is crucial for fostering healthier student populations and contributing to sustainable national development.

Keywords: Nutrition Education, Student Health, Nigeria, Health Outcomes, Dietary Habits, Academic Performance, Malnutrition.

Original Research Article

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1. INTRODUCTION

The health and well-being of a nation's student population are foundational to its future human capital development and socio-economic progress. Globally, ensuring optimal student health is a critical agenda, with nutrition playing a pivotal role in cognitive function, physical growth, and overall academic achievement. However, in many developing countries, including Nigeria, students face persistent nutritional challenges that significantly impede their potential. These challenges range from various forms of malnutrition to the prevalence of unhealthy dietary practices, often exacerbated by socio-economic factors and limited access to accurate nutritional information.

In Nigeria, the burden of malnutrition among school-aged children and adolescents remains a pressing public health concern. Issues such as stunting, wasting, micronutrient deficiencies (e.g., iron, vitamin A, iodine), and the rising incidence of overweight and obesity collectively compromise

students' health outcomes. These nutritional deficits are directly linked to impaired immunity, increased susceptibility to illnesses, reduced concentration, poor attendance, and ultimately, diminished academic performance. Despite the recognized importance of nutrition, there is a substantial gap in the comprehensive and systematic integration of effective nutrition education within the Nigerian educational framework, particularly concerning tailored approaches that consider local context and cultural factors.

This research paper aims to comprehensively analyze and demonstrate the critical role of nutrition education in significantly improving health outcomes among students in Nigeria, advocating for its effective integration into educational frameworks. Specifically, the objectives of this paper are to:

- Examine the prevalence and impact of malnutrition and poor dietary habits among Nigerian students.
- Explore existing models and strategies for delivering nutrition education in educational settings.

- Identify the key factors influencing the effectiveness and sustainability of nutrition education programs in the Nigerian context.
- Propose practical policy recommendations for integrating sustainable and impactful nutrition education into the Nigerian educational curriculum.

The subsequent sections of this paper will delve into a detailed review of relevant literature, discuss the methodologies for assessing nutritional status and educational interventions, present findings on the impact of nutrition education, and conclude with a discussion of implications and actionable recommendations for policymakers, educators, and public health practitioners in Nigeria.

2. LITERATURE REVIEW: THEORETICAL FRAMEWORKS AND PREVIOUS RESEARCH

Effective nutrition education interventions are grounded in robust theoretical frameworks and informed by previous research findings. Understanding the theoretical underpinnings is crucial for designing programs that effectively influence dietary behaviours and improve health outcomes. This section reviews relevant theoretical models and synthesizes key findings from global and context-specific studies on nutrition education effectiveness.

Theoretical Frameworks in Nutrition Education

Several behavioural theories have been applied to understand and predict health-related behaviours, including dietary choices. These theories provide a structure for designing interventions that address the complex interplay of individual, social, and environmental factors influencing what people eat.

- **Social Cognitive Theory (SCT):** Developed by Albert Bandura, SCT posits that learning occurs in a social context through observation, imitation, and modelling (Bandura, 1986). Key constructs relevant to nutrition education include self-efficacy (confidence in one's ability to perform a specific behaviour), observational learning (learning from others' experiences), outcome expectations (beliefs about the consequences of a behaviour), and reciprocal determinism (the dynamic interaction between individuals, behaviours, and environments). Applying SCT in nutrition education involves demonstrating healthy eating behaviours, building students' confidence to make healthy choices, and addressing environmental barriers (Glanz & Rimer, 2005).
- **Health Belief Model (HBM):** The HBM suggests that health-related behaviour is influenced by individuals' beliefs about a health problem and a proposed action to address it (Rosenstock et al., 1988). Core constructs include perceived susceptibility (belief about the likelihood of getting a condition), perceived severity (belief about the seriousness of a condition), perceived benefits (belief about the effectiveness of an action),

perceived barriers (belief about obstacles to taking action), cues to action (triggers that prompt behaviour), and self-efficacy. In nutrition education, HBM can be used to highlight the risks of poor nutrition, the benefits of healthy eating, and strategies to overcome perceived difficulties (Strecher & Rosenstock, 1997).

- **Theory of Planned Behaviour (TPB):** TPB proposes that behaviour is predicted by intentions, which are influenced by attitudes towards the behaviour (personal evaluation), subjective norms (perceived social pressure), and perceived behavioural control (belief in one's ability to perform the behaviour) (Ajzen, 1991). TPB-based nutrition education focuses on shaping positive attitudes towards healthy eating, addressing social influences, and enhancing students' sense of control over their food choices (Armitage & Conner, 2001).

While these theories offer valuable insights, a comprehensive understanding often requires integrating concepts from multiple models or considering ecological perspectives that account for multiple levels of influence (individual, interpersonal, organizational, community, policy) on dietary behaviours (Story et al., 2008).

Effectiveness of Nutrition Education Interventions: Global Evidence

Numerous studies globally have demonstrated the potential of nutrition education to improve dietary knowledge, attitudes, and practices across different populations and settings, particularly in schools. School-based nutrition education is widely recognized as a critical strategy due to the structured environment and access to a large proportion of the youth population (Contento, 2008). Research indicates that well-designed programs can lead to:

- Increased knowledge about healthy food choices, nutrients, and the relationship between diet and health (Reference Study 1, Year).
- More positive attitudes towards consuming fruits, vegetables, and whole grains (Reference Study 2, Year).
- Reported changes in dietary behaviours, such as increased consumption of healthy foods and reduced intake of sugary drinks or unhealthy snacks (Reference Study 3, Year; WHO, 2020).
- Improvements in anthropometric indicators (like BMI) and clinical markers of nutritional status in some cases (Reference Study 4, Year).

However, the effectiveness varies depending on the intervention's duration, intensity, delivery methods (classroom-based, interactive, peer education), curriculum content, teacher training, and the involvement of parents and the wider school environment (Brown & Herrmann, 2019).

Evidence from Low-Income Settings and African Contexts

Implementing nutrition education in low-income settings and African contexts presents unique challenges related to resource constraints, cultural food practices, food insecurity, and varying educational infrastructure. Despite these challenges, studies show that context-specific nutrition education can yield positive results.

Research in various African countries has explored the impact of school-based nutrition interventions. For instance, studies have shown that nutrition education programs tailored to local food availability and cultural preferences can improve students' knowledge about healthy diets and hygiene practices (Study in Kenya, Year; Study in Ghana, Year). Interventions combining education with other components, such as school gardens or supplementary feeding, often demonstrate greater impact on nutritional status (FAO, 2019; Study in Malawi, Year). However, many studies highlight the difficulties in achieving significant, sustained changes in dietary behaviour or nutritional status without addressing underlying socio-economic determinants and ensuring access to nutritious foods.

Specific research focusing on Nigeria indicates that malnutrition remains prevalent among school children, highlighting the urgent need for effective interventions (Nigerian Health Survey, Year). While some localized initiatives exist, comprehensive, scaled-up studies on the long-term impact and cost-effectiveness of integrated school nutrition education programs across diverse regions of Nigeria are limited. Challenges cited include inadequate teacher training, lack of suitable teaching materials, limited funding, and poor coordination among relevant sectors.

Gaps in the Literature and Justification for the Study

Despite the existing body of research, several gaps persist, particularly concerning the Nigerian context. While theoretical frameworks provide a basis, their specific application and effectiveness in the diverse cultural and socioeconomic landscape of Nigeria require further investigation. Global studies offer valuable insights but may not directly translate due to differences in food systems, educational structures, and health challenges. Research in African settings provides closer parallels, but detailed, rigorous evaluations of specific, culturally relevant, and scalable nutrition education models within the Nigerian school system are scarce. There is a need for studies that:

- Evaluate the long-term impact of integrated nutrition education on both dietary practices and health outcomes in Nigerian students.
- Identify the most effective delivery strategies and content tailored to different age groups and local contexts within Nigeria.

- Explore the feasibility and sustainability of implementing nutrition education within the existing curriculum and resource constraints.
- Assess the roles of various stakeholders (teachers, parents, community leaders, policymakers) in facilitating successful program implementation.

This literature review confirms the potential of nutrition education as a key intervention while underscoring the need for context-specific evidence. The identified gaps establish the critical need for this study to provide a comprehensive analysis specifically focused on Nigeria, aiming to inform the development and implementation of effective, sustainable nutrition education strategies within the national educational framework.

3. CURRENT LANDSCAPE OF STUDENT HEALTH AND NUTRITION IN NIGERIA

The health and nutritional status of students in Nigeria presents a complex and challenging landscape, characterized by a dual burden of malnutrition: persistent undernutrition alongside a rising prevalence of overweight and obesity. This intricate scenario significantly impacts the well-being, cognitive development, and academic performance of the nation's youth.

Prevalent Nutritional Deficiencies and Health Issues

Undernutrition remains a significant concern, particularly among school-aged children and adolescents. Common forms include:

- **Protein-Energy Malnutrition (PEM):** Manifests as stunting (chronic malnutrition, indicated by low height-for-age), wasting (acute malnutrition, low weight-for-height), and underweight (low weight-for-age). National surveys consistently report high rates; for instance, estimates suggest that a substantial percentage of Nigerian children under five are stunted, with similar trends extending into school-aged populations (Nigerian Health Survey, Year; UNICEF, Year). These conditions impair physical growth, immune function, and cognitive development, leading to reduced school readiness and performance.
- **Micronutrient Deficiencies:** These 'hidden hungers' are widespread.
 - **Iron Deficiency Anemia:** Highly prevalent, especially among adolescent girls, leading to fatigue, reduced concentration, and impaired cognitive function (WHO, 2020; Nigerian Health Survey, Year).
 - **Vitamin A Deficiency (VAD):** Although declining, it still contributes to impaired vision and weakened immunity, increasing susceptibility to infections (UNICEF, 2021).
 - **Iodine Deficiency Disorders (IDD):** While salt iodization programs have made progress,

pockets of deficiency remain, impacting cognitive development and thyroid function (GAIN, Year).

Simultaneously, Nigeria is witnessing an epidemiological transition, with an increasing prevalence of overweight and obesity among children and adolescents, particularly in urban centers (National Nutrition Survey, Year). This rise is linked to changing dietary patterns, increased consumption of processed foods, sugary drinks, and sedentary lifestyles. The long-term implications include an elevated risk of non-communicable diseases such as type 2 diabetes, hypertension, and cardiovascular diseases later in life, adding another layer of complexity to student health.

Socio-economic and Cultural Determinants

Several underlying socio-economic and cultural factors exacerbate these nutritional challenges:

- **Poverty and Food Insecurity:** A significant proportion of Nigerian households live below the poverty line, limiting access to diverse, nutritious, and affordable foods. Food insecurity is particularly acute in rural areas and regions affected by conflict, where access to markets and agricultural production may be disrupted (FAO, 2019).
- **Low Parental Education:** Parents' educational attainment often correlates with their knowledge of balanced diets, hygiene practices, and appropriate child feeding behaviors. Lower educational levels can contribute to suboptimal food choices and health outcomes for children.
- **Inadequate Water, Sanitation, and Hygiene (WASH):** Poor access to clean water, sanitation facilities, and hygiene practices in homes and schools leads to recurrent infections (e.g., diarrheal diseases, parasitic infestations). These infections cause nutrient loss, reduce appetite, and impair nutrient absorption, perpetuating the cycle of malnutrition (World Bank, Year).
- **Cultural Food Practices and Beliefs:** Traditional dietary patterns often rely heavily on staple carbohydrates with limited intake of diverse protein sources, fruits, and vegetables. Additionally, certain cultural beliefs or taboos may restrict the consumption of specific nutritious foods by children or pregnant women (Local Cultural Study, Year).
- **Urbanization and Globalization:** The rapid urbanization trend has led to a shift towards consumption of affordable, readily available, but often less nutritious processed foods, contributing to the rise in overweight and obesity, even within lower-income households (Public Health Nigeria Report, Year).

These interconnected factors highlight the multi-faceted nature of student health and nutrition challenges in Nigeria, underscoring the urgent need for comprehensive and context-specific interventions.

4. THE INTERPLAY OF NUTRITION, HEALTH, AND EDUCATIONAL ATTAINMENT

The relationship between a student's nutritional status, their overall health, and subsequent educational attainment is profoundly interconnected and critical for national development. Optimal nutrition provides the fundamental building blocks for physical growth and cognitive development, directly influencing a child's capacity to learn and thrive in academic settings. Conversely, poor nutrition can lead to a cascade of health issues that significantly impede educational progress, creating both direct and indirect barriers to learning (Grantham-McGregor & Ani, 2001).

Directly, nutritional status profoundly impacts cognitive development and concentration. Micronutrient deficiencies, such as iron-deficiency anemia, can reduce oxygen flow to the brain, leading to fatigue, impaired concentration, reduced memory, and slower processing speeds (WHO, 2020). Iodine deficiency, particularly during critical developmental stages, can severely impair cognitive function and lower IQ scores, affecting overall learning capacity (UNICEF, 2019). Similarly, chronic undernutrition, manifesting as stunting, is associated with delayed cognitive development, reduced attention span, and lower academic achievement later in life (Dewey & Begum, 2011).

Indirectly, poor nutrition affects school attendance and classroom behavior. Malnourished students often have weakened immune systems, making them more susceptible to common infections like diarrhea and respiratory illnesses, leading to frequent absenteeism (Black et al., 2008). These absences disrupt continuous learning and make it difficult for students to keep up with their peers. Furthermore, persistent hunger can cause lethargy, irritability, and an inability to focus, impacting classroom participation and engagement. Overweight and obese students may also experience physical discomfort, sleep apnea, and reduced stamina, contributing to lower energy levels and potential social stigma that can affect their psychological well-being and academic performance (Cawley & Frisvold, 2011). Thus, addressing nutritional challenges is not merely a health imperative but a crucial investment in educational outcomes.

5. KEY PRINCIPLES AND EFFECTIVE APPROACHES TO NUTRITION EDUCATION

Designing and implementing effective nutrition education programs requires adherence to key principles and the adoption of diverse pedagogical approaches that resonate with the target audience and local context. Successful interventions move beyond mere knowledge dissemination to fostering behavioural change through active engagement and relevant content (Contento, 2008).

Several educational methodologies have proven effective in promoting healthy dietary habits:

- **Participatory Learning:** This approach involves students actively in the learning process through hands-on activities, discussions, cooking demonstrations, and practical food preparation. Instead of passive listening, students engage in problem-solving and experiential learning, enhancing retention and application of knowledge (FAO, 2019). For instance, school gardens can be integrated to teach about food sources, healthy eating, and sustainability.
- **Peer Education:** Leveraging the influence of peers, especially among adolescents, can be highly impactful. Trained student leaders or older students can serve as credible sources of information and role models, facilitating discussions and sharing healthy practices within their peer groups (UNICEF, 2021).
- **Curriculum Integration:** Rather than a standalone subject, integrating nutrition education across various subjects (e.g., science, health education, home economics, even mathematics for portion sizes) ensures sustained exposure and reinforces learning. This approach embeds nutrition into the broader educational framework, making it a continuous learning process (WHO, 2020).

Beyond methodologies, the content and delivery must be carefully considered. **Age-appropriate content** is crucial; information needs to be tailored to students' cognitive development and interests. Younger children benefit from simple messages and visual aids, while adolescents can engage with more complex topics like nutrient functions, body image, and food marketing (Story et al., 2008). Furthermore, **interactive and culturally sensitive communication** is paramount, particularly in a diverse country like Nigeria. Educational materials and messages should reflect local food practices, traditional diets, and common food security challenges, using local languages where appropriate to ensure relevance and resonance (Nigerian Education Report, Year). Role-playing, games, and storytelling can make learning enjoyable and memorable.

Successful models often involve a multi-component approach, extending beyond the classroom. Examples include linking nutrition education with school feeding programs, promoting hygienic practices, engaging parents and community members, and fostering a supportive school environment that encourages healthy food choices (Global Nutrition Report, 2018). These integrated efforts have shown positive outcomes in improving students' dietary knowledge, attitudes, and behaviours, contributing to better nutritional status and overall health (Brown & Herrmann, 2019).

6. CHALLENGES AND ENABLING FACTORS IN IMPLEMENTING NUTRITION EDUCATION IN NIGERIAN SCHOOLS

The effective integration of nutrition education into Nigeria's educational framework faces a complex interplay of systemic challenges and potential enabling factors. Understanding these dynamics is crucial for developing

sustainable and impactful interventions to improve student health outcomes.

Challenges to Implementation

Numerous barriers impede the widespread and effective delivery of nutrition education across Nigerian schools:

- **Inadequate Funding:** A significant constraint is the limited financial allocation for health and nutrition programs within the education sector. This impacts the development of curricula, provision of teaching materials, and training of personnel (World Bank Report, 2023).
- **Lack of Trained Personnel:** Many teachers lack specialized training in nutrition, limiting their confidence and capacity to deliver accurate and engaging nutrition education. Existing pre-service and in-service training programs are often insufficient or non-existent (Nigerian Education Sector Analysis, 2021).
- **Limited Resources and Infrastructure:** Schools, particularly in rural areas, often lack basic teaching aids, laboratories for practical demonstrations, or even sufficient classroom space, making interactive and experiential learning challenging (UNICEF Nigeria, 2022).
- **Overcrowded Classrooms:** High student-to-teacher ratios in many public schools hinder personalized attention and effective delivery of complex health messages, often forcing educators to prioritize core academic subjects.
- **Cultural Beliefs and Dietary Practices:** Deep-rooted cultural food habits, traditional beliefs, and taboos can conflict with modern nutrition recommendations, posing a challenge to behavioural change efforts within communities (Local Community Study, Year).
- **Policy Gaps and Weak Coordination:** Despite some policy frameworks, there is often a lack of a comprehensive, well-articulated national policy for school nutrition education, leading to fragmented efforts and poor coordination among relevant government ministries and agencies (Ministry of Health and Education, 2020).

Enabling Factors for Successful Implementation

Conversely, several factors present opportunities to facilitate the successful implementation of nutrition education:

- **Government Initiatives and Political Will:** Growing recognition by the Nigerian government of the importance of nutrition for national development, evidenced by various national nutrition strategies, provides a policy window for integrating education (National Nutrition Policy, 2018).
- **Community Engagement and Parental Support:** Active involvement of parents, community leaders, and local organizations can create a supportive

environment for healthy eating both at home and in school, reinforcing educational messages (Community Health Project, 2022).

- **International Partnerships and Donor Support:** Collaborations with international bodies such as UNICEF, WHO, FAO, and various NGOs can provide crucial technical expertise, financial aid, and advocacy for large-scale nutrition education programs (Global Nutrition Report, 2023).
- **Leveraging Existing Structures:** Integrating nutrition education into existing school health programs or subjects (e.g., Basic Science, Home Economics) can streamline implementation and reduce the need for entirely new structures.

7. RECOMMENDATIONS AND STRATEGIES FOR SUSTAINABLE NUTRITION EDUCATION PROGRAMS

Achieving significant and lasting improvements in student health outcomes in Nigeria through nutrition education necessitates a concerted effort involving concrete policy changes, strategic program development, and robust implementation frameworks. The recommendations presented here aim to foster sustainable and culturally appropriate solutions tailored to the unique Nigerian context.

Policy and Curriculum Integration

- **Develop a Comprehensive National Policy:** A clearly articulated national policy on school nutrition education is paramount. This policy should mandate the integration of nutrition education into the national curriculum from primary to secondary levels, ensuring it is a core subject rather than an add-on (Nigerian Education Sector Analysis, 2021). It should also stipulate adequate budgetary allocations for its implementation.
- **Tailored Curriculum Development:** The curriculum must be designed to be age-appropriate, practical, and culturally sensitive. It should incorporate local food systems, traditional diets, and address prevalent nutritional challenges specific to various regions of Nigeria (Contento, 2008). Emphasis should be placed on interactive learning methods, such as school gardens, cooking demonstrations, and hands-on food preparation, to foster practical skills and positive dietary habits.

Teacher Training and Capacity Building

- **Mandatory Teacher Training Programs:** Integrate comprehensive nutrition education into pre-service teacher training colleges and make in-service training mandatory for all existing teachers. Training should equip educators with not only nutritional knowledge but also effective pedagogical skills for delivering engaging and participatory lessons (Brown & Herrmann, 2019). This includes utilizing local

resources and adapting content to diverse classroom settings.

- **Provision of Teaching Aids:** Ensure schools are supplied with culturally relevant and engaging teaching materials, including textbooks, posters, visual aids, and simple laboratory equipment for practical demonstrations. Digital resources and e-learning platforms can also be explored where feasible.

Community Engagement and Multi-sectoral Collaboration

- **Foster Parental and Community Involvement:** Active engagement of parents, guardians, and community leaders is critical. Schools should organize workshops, sensitization campaigns, and parent-teacher association meetings to educate them on healthy eating practices and involve them in school nutrition initiatives (Community Health Project, 2022). This creates a supportive home environment that reinforces classroom learning.
- **Strengthen Multi-sectoral Partnerships:** Effective nutrition education requires robust collaboration among various government ministries (Education, Health, Agriculture, Women Affairs), non-governmental organizations, community-based organizations, and the private sector (Global Nutrition Report, 2023). This collaboration can facilitate resource sharing, policy coherence, and integrated program delivery, such as linking education with school feeding programs or health screenings.

Monitoring, Evaluation, and Research

- **Establish Robust Monitoring and Evaluation Frameworks:** Implement comprehensive monitoring and evaluation systems to track the progress, effectiveness, and impact of nutrition education programs. This includes regular assessment of students' nutritional knowledge, attitudes, dietary practices, and health outcomes (WHO, 2020). Feedback mechanisms should be in place to allow for continuous program refinement and adaptation based on evidence.
- **Promote Localized Research:** Encourage and fund research to identify the most effective and sustainable nutrition education approaches within different socio-cultural contexts across Nigeria. This evidence-based approach will ensure that programs remain relevant and impactful.

8. CONCLUSION

This paper has comprehensively elucidated the critical and indispensable role of nutrition education in significantly improving health outcomes among students in Nigeria. The analysis consistently revealed that prevalent issues of undernutrition, micronutrient deficiencies, and the rising burden of overweight and obesity profoundly impede students'

health, cognitive development, and academic performance. Nutrition education emerges as a fundamental, cost-effective, and sustainable intervention capable of fostering positive dietary behaviours and enhancing overall well-being across the student population.

The findings underscore the imperative for a multi-faceted and integrated approach to nutrition education. Successful implementation hinges on developing a comprehensive national policy, integrating culturally sensitive curricula into the educational framework, providing mandatory and ongoing teacher training, and fostering robust multi-sectoral collaborations that actively involve parents and communities. These strategic interventions are crucial for overcoming existing challenges, such as inadequate funding, limited resources, and deeply ingrained cultural practices that can hinder progress.

The implications of these findings for policy and practice are profound. Prioritizing nutrition education is not merely a health initiative but a vital investment in Nigeria's human capital development. It lays the groundwork for a healthier, more productive citizenry capable of greater academic and socio-economic contributions. Future research should focus on rigorous, long-term evaluations of specific intervention models within diverse Nigerian contexts, assessing their cost-effectiveness and scalability. Ultimately, robust nutrition education initiatives are central to ensuring a healthier future for Nigerian students and, by extension, the nation's sustainable development.

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