Assessment of Nutrition Education Practices and Their Impact on Child Health Among Primary School Pupils in Rural Communities in Nigeria

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Abstract
Background: *Undernutrition remains one of the quiet emergencies of rural Nigeria. Children who survive the under-five years often enter primary school already stunted, carrying worm infections and eating monotonous diets. Schools reach these children every weekday, yet very little is known about how nutrition is actually taught in rural classrooms or whether that teaching changes anything for the child's health.*
Objective: *This paper assesses current nutrition education practices in Nigerian primary schools, with particular attention to rural communities, and examines the evidence on their impact on pupils' nutrition knowledge, eating behaviour, nutritional status and related health outcomes.*
Methods: *A structured narrative review was carried out. Peer-reviewed articles, institutional repository records and national survey reports published between 2008 and 2025 were identified through PubMed Central, African Journals Online (AJOL), the Directory of Open Access Journals and Nigerian university repositories. Studies were eligible if they involved primary school pupils or their teachers in Nigeria and reported on nutrition education, nutritional status, dietary practice or diet-related health. Findings were grouped thematically and appraised for design quality.*
Results: *Eighteen studies and two national survey sources were included. Nutrition content in Nigerian primary schools is delivered mainly as a minor topic within Basic Science, Physical and Health Education and Home Economics, with little practical work, few teaching aids and limited teacher training. Teachers' knowledge was moderate: in one Oyo State survey only 57.1% of teachers scored "good" on malnutrition knowledge, and insufficient time and funding were the main barriers they reported. Short, structured interventions in Ogun and Oyo States consistently improved pupils' nutrition knowledge, attitudes and self-reported healthy eating. However, no Nigerian study identified in this review measured the effect of classroom nutrition education on anthropometric outcomes. Meanwhile, the burden in rural schools is heavy: stunting reached 41.6% in a rural Enugu community and 46.2% in rural Ogun schools, against 33.8% in nearby urban schools, and rural pupils in Ekiti were nearly three times as likely as urban pupils to have low dietary diversity (24.8% vs 8.5%).*
Conclusion: *Nutrition education in rural Nigerian primary schools is present on paper but thin in practice. It reliably improves what children know, but the link to measurable health gains has not been tested. A practical, teacher-supported model that is tied to school feeding, deworming, hygiene and parental involvement is recommended, together with rigorous trials that track growth and health outcomes.*

Keywords: *nutrition education; primary school pupils; rural communities; child health; stunting; school feeding; Nigeria*

1. Introduction

1.1 Background

Anyone who has spent a morning in a rural Nigerian primary school will recognise the scene. Some children arrive having eaten nothing. Others bring a small wrap of garri, a piece of bread or a few coins for the vendor at the gate. By mid-morning, attention drifts. The teacher, who may be handling sixty pupils in one room, has a scheme of work that mentions "food and nutrition" somewhere between the topics on weather and the human skeleton. Whether that lesson ever becomes more than a list of "body-building foods" copied from the blackboard depends almost entirely on the individual teacher. This matter because the nutritional situation of Nigerian children is serious and is not improving fast. The 2023–24 Nigeria Demographic and Health Survey (NDHS) found that about 40% of children under five were stunted, 8% were wasted and 27% were underweight (BusinessDay, 2025). Analysis of the 2018 NDHS showed that stunting varied enormously across the country, from 2.0% in Shomolu, Lagos, to 66.4% in Biriniwa, Jigawa, and that children in urban areas and richer households were less likely to be stunted (Ahmed et al., 2023). Children who are stunted at age four do not simply catch up at age six. They carry that deficit into the classroom, where it shows up as poorer cognition, weaker school performance and, later, lower earnings. Primary school is the one public institution that reaches most rural children consistently over several years. Nigeria's National School Health Policy (2006) recognises this and lists health education, including nutrition, as a core component of the school health programme. The National Home-Grown School Feeding Programme (NHGSFP), launched in 2016, added a daily meal for pupils in the lower classes of public primary schools. On paper, then, the school is already positioned as a site for nutrition promotion. The open question is what happens in practice, particularly in rural communities where schools have fewer resources, teachers have less training and household food insecurity is deeper.

1.2 Statement of the problem

Three gaps motivate this paper. First, most Nigerian nutrition research has focused on children under five, leaving school-aged children comparatively understudied. Second, the studies that do exist on school-aged children are mostly prevalence surveys. They tell us how many pupils are stunted or underweight but say little about what schools are doing about it. Third, where nutrition education has been tested, the studies are small, short and largely urban or peri-urban, and they rarely look beyond changes in knowledge. A policymaker in a rural local government area who wants to know whether investing in nutrition education will improve children's health currently has little Nigerian evidence to draw on.

1.3 Objectives

The general objective is to assess nutrition education practices in Nigerian primary schools, with emphasis on rural communities, and their impact on child health. The specific objectives are to:

1. Describe how nutrition education is delivered in Nigerian primary schools, including curriculum content, teaching methods and teacher preparedness.
2. Summarise the nutritional and health status of primary school pupils in rural Nigerian communities.
3. Examine the evidence on the effect of school-based nutrition education on pupils' knowledge, attitudes, dietary practices and health outcomes.
4. Identify the barriers to effective nutrition education in rural schools and propose practical

recommendations.

1.4 Research questions

1. What nutrition education practices are used in Nigerian primary schools, and how adequately prepared are teachers to deliver them?
2. What is the burden of malnutrition and diet-related ill health among primary school pupils in rural Nigeria compared with their urban peers?
3. To what extent does school-based nutrition education improve pupils' knowledge, behaviour and nutritional status?
4. What factors limit the effectiveness of nutrition education in rural schools?

1.5 Significance

The findings should be useful to at least four groups. State Universal Basic Education Boards and curriculum planners can use them to strengthen the nutrition content of the basic education curriculum. Programme managers of the NHGSFP can see where an educational component could add value to the meal itself. Teacher training institutions can identify the gaps in pre-service and in-service preparation. Researchers will find a clear statement of what has not yet been studied, especially the missing link between classroom teaching and measurable health outcomes.

2. Literature Review and Conceptual Framework

2.1 Nutrition education: what it is and what it is meant to do

Nutrition education is more than telling children which foods are "good". In its fuller sense, it is any combination of learning experiences designed to help people choose and keep eating habits that support health. For a nine-year-old in a farming village, that means knowing why beans and fish matter, recognising that the vegetables growing behind the house are worth eating, washing hands before meals and having enough confidence to ask for a share of the egg rather than leaving it all to an older brother. Knowledge is the starting point, but the goal is behaviour, and behaviour depends heavily on what food is actually available.

School-based nutrition education is usually delivered in one or more of four ways: as a topic inside an existing subject; as a stand-alone lesson series or club; through practical activities such as school gardens, cooking demonstrations and meal-time teaching; and through the wider school environment, including the food sold by vendors and the meals served under feeding programmes. International experience suggests that the more these channels reinforce each other, the stronger the effect.

2.2 The Nigerian policy and curriculum context

Nigeria's response to child nutrition sits within several overlapping frameworks. The National Policy on Food and Nutrition (2016) sets out a multisectoral approach and recognises education as one of the sectors with a role to play (Ahmed et al., 2023). The National School Health Policy assigns school's responsibility for health instruction, healthful school environments, school health services and school feeding. The NHGSFP provides one hot meal a day to pupils in primary one to three of public schools, sourced as far as possible from local farmers.

In the classroom, nutrition does not have a subject of its own at primary level. It appears as topics within Basic Science and Technology, Physical and Health Education and, in some states, Home Economics or Cultural and Creative Arts. Typical content covers classes of food, the balanced diet, food hygiene and deficiency diseases such as kwashiorkor. Teachers who have studied it describe the approach as theory-heavy. In Ilaro, Ogun State, Alaba and Addo (2017) recommended that curriculum planners add more food-based topics and support them with posters and practical games, which implies that these were not routinely available.

One revealing detail concerns the school lunch environment outside the feeding programme. In Ibadan, researchers noted that school lunch is largely unregulated and that the menu is set by individual vendors, so pupils make food choices without supervision (Adeoya et al., 2023). In practice, the lessons a child hears in the morning compete with whatever is fried at the gate at break time.

2.3 The burden of malnutrition among school-aged children

Studies of primary school pupils in Nigeria show that malnutrition does not end at age five. A community survey of 1,200 children and adolescents aged 6 to 19 in Osun and Gombe States documented both undernutrition and overweight in the same populations, the so-called double burden (AAS Open Research, 2021). In Jos, Plateau State, 10.5% of 450 pupils aged 6 to 12 were stunted, and the authors noted that national stunting prevalence ranges from about 55% in the North-West to 16% in the South-East (Adedeji et al., 2018). Rural figures are consistently worse, as Section 4 shows.

Infection is part of the picture. Soil-transmitted helminths, which feed on the child's nutrients and blood, were found in 30.3% of 284 primary pupils in a rural Imo State community (Imo STH study, 2015), and in 16.8% of 1,372 pupils in North-Central Nigeria, with rural schools at 18.3% against 15.3% in urban schools (University of Ilorin, 2024). In Ede-Oballa, rural Enugu State, children infected with whipworm were nearly four times as likely to be zinc and vitamin A deficient as uninfected children (Ayogu et al., 2018). Nutrition education that ignores hygiene therefore misses a large part of what determines a child's nutritional status.

2.4 Evidence on nutrition education in Nigeria

Two strands of Nigerian work are relevant. The first examines teachers. In Ido Local Government Area, Oyo State, 57.1% of 387 primary school teachers had good knowledge of malnutrition, 38.5% fair and 4.4% poor; teachers in private schools knew more than those in public schools, and insufficient instructional time and insufficient funds were named as the main barriers (Ido LGA teacher survey). In Ilaro, 55% of 100 teachers were judged to have good nutrition knowledge (Alaba & Addo, 2017).

The second strand tests interventions with pupils. In Ikenne, Ogun State, 240 pupils in primary five and six from three public schools received nutrition education, lifestyle modification or both; all three approaches improved nutrition knowledge and healthy eating behaviour, and girls benefited more than boys (Global Journal of Health Science, 2019). In Ibadan, a six-week programme for 100 pupils in primary four and five, evaluated with a pre-test/post-test quasi-experimental design, improved knowledge and attitudes towards mid-day meal choices (Adeoya et al., 2023). In a different format, a four-week garden-enhanced holiday programme for 24 children aged 6 to 11 in Ibadan combined gardening, lessons and a cooking demonstration and recorded a significant rise in nutrition knowledge (Ejoh & Oyedele, n.d.). A similar intervention was evaluated in Ilishan-Remo, Ogun State (Akinlade et al., n.d.). None of these studies followed children long enough, or measured them physically, to show an effect on growth.

2.5 Conceptual framework

This review is organised around a simple causal chain adapted from the UNICEF framework on the causes of child undernutrition and from the Health Belief Model. The chain runs as follows:

1. **Inputs** – curriculum content, trained teachers, teaching time, materials, school feeding, water and sanitation facilities.
2. **Nutrition education practices** – what is actually taught and how: lecture, demonstration, garden work, meal-time teaching, parental outreach.

3. **Intermediate outcomes in the child** – knowledge, attitudes, perceived benefits and barriers, self-efficacy in food choice and hygiene.
4. **Behaviour** – dietary diversity, breakfast and snack choices, handwashing, use of the school meal.
5. **Health outcomes** – growth (height-for-age, BMI-for-age), micronutrient status, worm burden, illness, attendance and learning.

At every step, household food security, parental education and community conditions act as moderators. A child who has learned that eggs are nutritious cannot eat one if the household sells every egg to buy kerosene. This is the main reason why gains in knowledge do not automatically become gains in health, and it shapes how the evidence in this paper is interpreted.

3. Methodology

3.1 Design

This paper is a structured narrative review. A narrative design was chosen over a formal meta-analysis because the Nigerian evidence is varied in design, outcome and measurement, and much of it sits in local journals and university repositories that are poorly indexed. Pooling such studies statistically would give a false sense of precision. A structured approach was still used for searching, selection and appraisal so that the review can be repeated and checked.

3.2 Search strategy

Searches were run in PubMed Central, African Journals Online (AJOL), the Directory of Open Access Journals (DOAJ), Google Scholar and the institutional repositories of the University of Ibadan, University of Jos, University of Ilorin, Babcock University and Federal Polytechnic Ilaro. Search terms combined three blocks:

- **Population:** "primary school" OR pupils OR "school-age children" OR "school children"
- **Exposure or outcome:** "nutrition education" OR "nutrition knowledge" OR "school feeding" OR stunting OR underweight OR malnutrition OR "dietary diversity" OR helminth
- **Setting:** Nigeria OR rural OR the name of a Nigerian state

Reference lists of included articles were scanned for further studies. National survey data on child nutrition were drawn from the Nigeria Demographic and Health Survey (NDHS) 2018 and 2023–24.

3.3 Eligibility criteria

Studies were included if they:

1. were conducted in Nigeria;
2. involved primary school pupils (roughly aged 5–15) or their teachers;
3. reported on at least one of the following: nutrition education content or delivery, teachers' nutrition knowledge, pupils' nutrition knowledge or dietary practice, anthropometric status, micronutrient status, helminth infection or school feeding; and
4. were published between 2008 and 2025 in English.

Studies focused only on children under five, on secondary school students alone, or on clinical populations were excluded. Rural-only and rural–urban comparative studies were given priority, but urban intervention studies were retained because they are currently the only Nigerian evidence on the effect of nutrition education.

3.4 Data extraction and synthesis

For each study, the following were recorded: author and year, state and setting (rural, urban or both), design, sample size, population, and main findings relevant to the research questions.

Findings were then grouped into four themes that mirror the research questions: (a) nutrition education practices and teacher preparedness; (b) the nutritional and health status of rural pupils; (c) the effect of nutrition education interventions; and (d) the role of school feeding and the wider school environment.

3.5 Quality appraisal

Each study was judged informally against the criteria commonly used for observational and quasi-experimental research: clarity of sampling, sample size, use of standard measurement tools (for example, WHO AnthroPlus z-scores for anthropometry), presence of a comparison group and appropriateness of analysis. Studies were not excluded on quality grounds, but weaknesses are noted where they affect interpretation. In general, the prevalence studies were stronger methodologically than the intervention studies, most of which lacked a control group or follow-up beyond the end of the programme.

3.6 Ethical considerations

This review used only published and publicly available data, so formal ethical approval was not required. Each primary study is cited so that readers can verify the original findings.

4. Results

4.1 Overview of included studies

Eighteen primary studies met the inclusion criteria: four nutrition education interventions, two surveys of teachers, eight studies of pupils' nutritional or dietary status, two studies of pupils in schools running the NHGSFP, and two studies of helminth infection. They span all six geopolitical zones, though the South-West is over-represented, and most were cross-sectional. Table 1 summarises them.

Table 1. Summary of included studies

Study	State / setting	Design and sample	Key findings
Adeoya et al. (2023)	Oyo (Ibadan), urban	Quasi-experimental, 100 pupils, Primary 4–5, 6 weeks	Knowledge mean 20.9 → 22.8; attitude 13.5 → 18.2 (both $p < .05$)
Global Journal of Health Science (2019)	Ogun (Ikenne), semi-urban	Quasi-experimental, 3 arms, 240 pupils, Primary 5–6	Nutrition education, lifestyle modification and both combined all improved knowledge and healthy eating; girls gained more
Ejoh & Oyedele (n.d.)	Oyo (Ibadan)	Garden-enhanced pilot, 24 children aged 6–11, 4 weeks	Significant rise in nutrition knowledge; gardening and cooking demonstration feasible
Akinlade et al. (n.d.)	Ogun (Ilishan-Remo), semi-rural	Pupil knowledge survey with education intervention	Evaluated pupils' knowledge and an intervention in a public school
Ido LGA teacher survey	Oyo (Ido LGA), peri-urban/rural	Cross-sectional, 387 teachers	57.1% good, 38.5% fair, 4.4% poor knowledge; public-school teachers

Study	State / setting	Design and sample	Key findings
			scored lower; time and funds the main barriers
Alaba & Addo (2017)	Ogun (Ilaro)	Cross-sectional, 100 teachers	55% had good nutrition knowledge; called for practical, food-based content and teaching aids
Ayogu et al. (2018)	Enugu (Ede-Oballa), rural	Cross-sectional, 450 children aged 6–15	Stunting 41.6%, underweight 18.2%, thinness 20.0%, zinc deficiency 43.3%, vitamin A deficiency 51.1%
Adenuga et al. (2017)	Ogun (Obafemi Owode), rural and urban	Cross-sectional, 1,160 pupils	Stunting 46.2% rural vs 33.8% urban ($p < .001$); older pupils most affected
Ekiti rural–urban study (2024)	Ekiti, rural and urban	Comparative cross-sectional, 983 pupils	Low dietary diversity 24.8% rural vs 8.5% urban; malnutrition 48.6% rural, 47.1% urban
Anambra rural–urban study (2015)	Anambra, rural and urban	Comparative cross-sectional, 365 pupils	Stunting 3.3% rural vs 0.5% urban; underweight linked to low parental education
Mafuyai et al. (2012)	Plateau (Bokkos), rural	Descriptive survey	Mean BMI 12.6 kg/m²; nutritional status judged low; authors recommended education on local foods
Borno rural study	Borno (Bama, Banki), rural	Cross-sectional, 400 pupils	62% low socioeconomic class; underweight common and rising with age; no obesity
Adedeji et al. (2018)	Plateau (Jos), urban	Cross-sectional, 450 pupils aged 6–12	Stunting 10.5%; higher in public schools, poorer families and children of less-educated mothers
Osun–Gombe survey (2021)	Osun and Gombe, community	Cross-sectional, 1,200 aged 6–19	Under- and overnutrition co-exist (double burden)
Obembe et al. (2024)	Ondo	Cross-sectional, 234 public (NHGSFP) and 227 private pupils	Stunting 20.7% overall, 30.3% in public schools; wasting 23.9% in public schools
NHGSFP blood-pressure study	Oyo and Ogun	Cross-sectional, 40 NHGSFP schools	Stunting 41.6% at 10–15 years vs 11.3% at 5–9 years; hypertension 6.0%
Imo STH study (2015)	Imo (Amaruru), rural	Cross-sectional, 284 pupils	Helminth infection 30.3%; boys 38.4% vs girls 21.1%

Study	State / setting	Design and sample	Key findings
North-Central STH study (2024)	North-Central, rural and urban	Cross-sectional, 1,372 pupils aged 4–12	Infection 16.8%; rural 18.3% vs urban 15.3%; boys higher

4.2 How nutrition is taught: practices and teacher preparedness

Across the studies that describe classroom practice, a consistent picture emerges. Nutrition is taught as a short topic within broader subjects, mostly through lecture and note-copying. Practical elements such as tasting sessions, food demonstrations, gardens or school meal discussions appear only in research projects, not in routine teaching. Teaching aids are scarce, which is why the Ilaro authors specifically recommended posters and games (Alaba & Addo, 2017). Teacher preparedness is moderate at best. In Ido LGA, just over half of teachers had good knowledge of malnutrition, and the gap between private and public-school teachers is worrying because rural children overwhelmingly attend public schools. Teachers themselves named insufficient instructional time and insufficient funding as the main barriers to teaching nutrition and physical education. Neither teacher study found that years of experience or qualification predicted knowledge, which suggests that pre-service training does not reliably equip teachers on this subject.

4.3 The nutritional and health status of rural pupils

The burden in rural schools is heavy and is consistently worse than in towns. The clearest direct comparisons are shown in Table 2.

Table 2. Rural–urban comparisons among primary school pupils

Indicator	Study	Rural	Urban
Stunting	Adenuga et al. (2017), Ogun	46.2%	33.8%
Low dietary diversity	Ekiti study (2024)	24.8%	8.5%
Stunting	Anambra study (2015)	3.3%	0.5%
Helminth infection	North-Central study (2024)	18.3%	15.3%

Three further patterns stand out. First, deficits grow with age: in Oyo and Ogun, stunting was almost four times higher among pupils aged 10–15 than among those aged 5–9, and in Obafemi Owode younger pupils had much lower odds of stunting than those over 13. Second, hidden hunger is widespread. In rural Ede-Oballa, roughly half of the children were vitamin A deficient and more than four in ten were zinc deficient (Ayogu et al., 2018). Third, infection and nutrition are tightly linked. Whipworm infection was associated with markedly higher odds of zinc and vitamin A deficiency, and helminth prevalence in rural pupils ranged from 18.3% to 30.3%. Social determinants recur in nearly every study: low parental, especially maternal, education; poverty; large family size; poor toilet facilities; and attending a public rather than a private school. These are precisely the conditions that characterise rural communities.

4.4 Effect of nutrition education on pupils

Every Nigerian intervention identified reported a positive change in knowledge. In Ibadan, mean knowledge scores rose from 20.9 to 22.8 and attitude scores from 13.5 to 18.2 after six weeks (Adeoya et al., 2023). In Ikenne, nutrition education, lifestyle modification and their combination all improved both knowledge and self-reported healthy eating. The Ibadan garden pilot showed that hands-on gardening and cooking could be delivered to young children and raised knowledge scores. The limits of this evidence are just as clear. All four interventions were short, ranging from four to six weeks. None used a randomised design with a separate control group in the same period, and none followed pupils for months afterwards to see whether changes lasted. Outcomes were self-reported knowledge, attitude and practice. **No**

Nigerian study identified in this review measured the effect of classroom nutrition education on height, weight, BMI, haemoglobin, micronutrient status or worm burden. In addition, all four interventions were delivered in urban or semi-urban Oyo and Ogun State schools, not in remote rural areas.

4.5 School feeding and the wider school food environment

The NHGSFP is the largest nutrition intervention in Nigerian primary schools, but its educational potential is largely unused. In Ondo State, after more than five years of the programme, public school pupils still had higher stunting (30.3%) and wasting (23.9%) than private school pupils who did not receive meals, though the authors note there was no baseline against which to judge change (Obembe et al., 2024). Grey literature from North-Eastern Nigeria suggests that the programme may improve dietary diversity and height-for-age. None of the feeding studies described any structured nutrition teaching around the meal. Outside the programme, food sold by unregulated vendors remains the default mid-day meal for many older pupils.

5. Discussion

The central finding of this review can be put simply: nutrition education in Nigerian primary schools works for knowledge, but there is no Nigerian evidence yet that it works for health, and rural children, who need it most, are the least likely to receive it in a meaningful form.

5.1 A curriculum present on paper but thin in practice

Nutrition is not absent from the Nigerian primary curriculum. The problem is the form it takes. A topic covered in two or three lessons a term, taught from a textbook and examined by recall, will produce children who can list the six classes of food but who still skip breakfast and buy fried snacks at break. The teacher surveys reinforce this. Teachers with only moderate knowledge, little time and no materials are being asked to change children's habits. It is not surprising that they fall back on definitions and notes.

The rural dimension sharpens this. Rural public schools tend to have larger classes, fewer resources and a higher share of teachers working outside their specialism. The Ido LGA finding that public school teachers knew less than private school teachers, together with the Jos finding that stunting was higher in public schools (Adedeji et al., 2018), suggests a double disadvantage: the children with the greatest nutritional need sit in the classrooms least equipped to teach nutrition well.

5.2 Why knowledge gains do not automatically become health gains

The intervention studies show that Nigerian children respond quickly to well-designed teaching. A six-week programme produced measurable improvement in Ibadan, and girls in Ikenne responded particularly well. This is encouraging. However, the step from knowing to eating differently, and from eating differently to growing better, depends on conditions that schools do not fully control. The first is food access. In rural Ekiti, one in four pupils had a low dietary diversity score. In Ede-Oballa, weekly household food expenditure and household income predicted undernutrition (Ayogu et al., 2018). A child cannot act on a lesson about fruit and protein if the household cannot afford them. The second is infection. With helminth prevalence of up to 30% in rural schools, and with clear links between worm infection and micronutrient deficiency, improving diet alone will not restore growth unless hygiene and deworming improve too. The third is timing. Much stunting is established before school entry, and the evidence that it worsens with age in school suggests that the school years are a period of continued faltering rather than recovery. Nutrition education can slow that decline, but it cannot erase early deficits by itself.

This is consistent with the conceptual framework in Section 2.5. Knowledge and attitude are intermediate outcomes. They are necessary but not sufficient. The Nigerian studies stopped at this intermediate step, so they cannot tell us how much of the remaining distance education can cover.

5.3 The missed opportunity of school feeding

The NHGSFP places a meal in front of millions of pupils every school day. In principle, that meal is the best teaching aid a nutrition lesson could have: real food, eaten together, that teachers can talk about. In practice, none of the feeding studies described any structured educational component. Meanwhile, the Ondo findings show that the meal alone has not closed the nutritional gap between public and private school pupils. Linking the two, so that the meal becomes a daily nutrition lesson and the lesson refers to the meal, is a cheap and obvious step that has not yet been taken at scale.

The Ibadan garden pilot points in the same direction. Gardens give rural schools something they have in relative abundance, which is land and farming knowledge in the community. A school garden can supply vegetables to the feeding programme, give children hands-on lessons and involve parents who farm. This would also align with the "home-grown" principle of the NHGSFP itself.

5.4 Gender, age and the double burden

Two subgroups deserve attention. Older pupils, especially those aged 10 and above, show the highest stunting in several studies, yet the NHGSFP mainly targets primary one to three. This leaves the most affected age group outside the feeding programme. Boys had higher helminth infection in both STH studies, while girls appeared to gain more from education in Ikenne. These patterns suggest that programmes should not be one-size-fits-all.

At the same time, the Osun–Gombe survey and the Ondo data show that overweight is appearing alongside undernutrition, and the Oyo–Ogun study found hypertension in 6.0% of pupils. Rural areas are not immune to cheap, energy-dense processed foods. Nutrition education in rural schools therefore needs to address both sides: getting enough of the right foods and avoiding the wrong ones.

5.5 Comparison with wider evidence

These findings echo studies from other low- and middle-income countries. In Nepal, a 12-week school nutrition education programme improved adolescents' knowledge and attitudes (BMC Nutrition, 2024). Ethiopian studies of primary pupils have recommended combining community-based nutrition education with school feeding and economic support. The common lesson is that education is most effective as one part of a package rather than as a stand-alone activity, which is exactly the gap observed in Nigeria.

6. Recommendations, Limitations and Conclusion

Conclusion

Rural Nigerian primary school pupils carry a heavy and largely invisible burden of malnutrition. Stunting affects four in ten children in some rural communities, micronutrient deficiencies are common, worm infection is widespread and dietary diversity is poor. Schools are well placed to respond, and national policy already gives them that role. Yet nutrition education as currently practised is mostly a brief, theory-based topic delivered by teachers who lack time, materials and training.

The Nigerian evidence shows that when nutrition is taught well, children learn quickly and their attitudes change. What it does not yet show is whether that learning translates into better growth and health. Closing that gap requires two things. Practically, nutrition education must

be connected to food, through school feeding and gardens, to hygiene and deworming, and to parents. Scientifically, it must be tested properly in rural schools with outcomes that matter for children's bodies, not only their test scores. A rural child who learns what a balanced meal looks like deserves a school system that also helps make that meal possible.

6.1 Recommendations

For federal and state education authorities (UBEC and SUBEBs)

1. Revise the primary curriculum so that nutrition is taught as a sequenced strand from primary one to six, with at least one practical activity per term, rather than as isolated topics.
2. Produce low-cost teaching kits built around locally available foods, such as picture cards of local vegetables, legumes and fish, a simple food-group poster in Hausa, Igbo, Yoruba and English, and a handwashing demonstration set.
3. Include nutrition and school health in in-service training for public primary school teachers, prioritising rural local government areas.

For the National Home-Grown School Feeding Programme

4. Add a short, structured "meal-time lesson" component, in which teachers or cooks spend five minutes linking the day's meal to food groups and hygiene.
5. Pilot school gardens in rural schools that supply vegetables to the programme and serve as outdoor classrooms.
6. Consider extending feeding, or at least nutrition education with a food component, to pupils in primary four to six, who show the highest stunting.

For health authorities and schools together

7. Combine nutrition education with regular deworming, safe water and handwashing facilities, since infection undermines dietary gains.
8. Introduce simple annual growth monitoring (height and weight) in rural schools, which would also generate the outcome data that is currently missing.
9. Involve parents through Parent–Teacher Association meetings and take-home activities, because household food choices are made by caregivers, not pupils.

For researchers

10. Conduct cluster-randomised or well-controlled trials of nutrition education in rural schools, lasting at least one school year, that measure anthropometry, haemoglobin and dietary diversity alongside knowledge.
11. Prioritise the North-West and North-East, where under-five stunting is highest and school-based evidence is thinnest.
12. Evaluate the NHGSFP with proper baselines so that its nutritional impact, with and without an educational component, can be judged.

6.2 Limitations of this review

Several limitations should be kept in mind. The review is narrative rather than a formal systematic review, so although searching was structured, some studies, particularly those in print-only local journals, may have been missed. Most included studies were cross-sectional and cannot establish cause and effect. The intervention studies were small, short and conducted mainly in urban or semi-urban South-West Nigeria, which limits how far their findings apply to remote rural communities. For a few studies only abstracts or repository records were accessible, so some details of methods could not be checked. Finally, prevalence figures from different studies used different age ranges and reference standards and should be compared with caution.

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