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PREVALENCE OF MALNUTRITION AMONG SCHOOL AGE CHILDREN IN SABON GARI LOCAL GOVERNMENT AREA, KADUNA STATE

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ABSTRACT

The study assessed the prevalence of malnutrition among school-age children in Sabon Gari Local Government Area, Kaduna state, using a multi-stage cross-sectional study design. Two hundred and ninety-seven school-age children of both sexes were selected and standard anthropometric techniques were used as described by WHO. Socio-demographic analysis revealed that 86.2% of the children attend public schools. Gender balance was observed, with 49.8% males and 50.2% females. The majority of the school- age children belong to the Hausa ethnic group (73.8%), followed by Fulani (12.4%), Yoruba (4.8%), and Igbo (4.8%) ethnic groups. Fathers of school-age children were primarily civil servants (42.5%), while their mothers were predominantly involved in trading (46.6%). Anthropometric indicators of Weight-for-Age Z score (WAZ) indicated that 37.1% of the children had normal weight-for-age, 25.2% were moderately underweight (< -2 Z score) and 1.4% were severely underweight (<-3 Z score), Height-for-Age Z score (HAZ) showed that 30.0% had normal height-for-age, while 26.6% were moderately stunted (< -2 Z score) and 11.8% were severely stunted (< -3 Z score). BMI-for-Age Z score (BAZ) revealed that 37.0% had a normal body mass index for age, while 15.5% exhibited moderate thinness (< -2 Z score) and 10.4% were severely thin (< -3 Z score). Malnutrition continues to be a public health concern among school-age children, anthropometric measurements revealed differences in nutritional health, highlighting the importance of combating underweight, stunting and thinness. Thus, findings provided valuable insights for tailored strategies aimed at improving the nutritional outcomes of school-age children in Sabon Gari LGA, Kaduna State.

Keywords: Undernutrition, Anthropometry, Stunting, Underweight Wasting, Public Health, School-Age Children, Sabon Gari, Nigeria

INTRODUCTION

Under-nutrition is a serious public health concern among children with huge challenges on the affected children, their families and the nation (Ayogu *et al.*, 2018). Childhood is a critical phase of growth and development, during which health outcomes impact current and future generations (Aguayo and Paintal, 2017). Rapid growth during this time creates high nutrient demand and can lead to growth faltering if nutritional needs are not met (Slemming *et al.*, 2022). Previous studies had shown that suffering from under- or overnutrition during the school years can inhibit a child's physical and mental development (Black *et al.*, 2020). Undernutrition causes immune dysfunction with an increased risk of infection (Shrivastava *et al.*, 2012), cognitive impairment (Mwaniki and Makhokha, 2013. UNICEF, 2013), reduced physical capacity, growth faltering, low productivity in adulthood (UNICEF, 2013). All these challenges contribute to the economic losses estimated to account for as much as 11% of Gross Domestic Product (GDP) (UNICEF, 2023). The overweight or obese schoolchild also faces increased risks of high blood pressure, metabolic syndrome, non-insulin-dependent (type 2) diabetes, and psychological disorders (WHO, 2024). Low height-for-age (also known as stunting) is as a result of chronic or recurrent undernutrition (WHO, 2022), is the most commonly used indicator of chronic malnutrition usually associated with poor socioeconomic conditions, poor maternal health and nutrition, frequent illness, and/or inappropriate infant and young child feeding and care practices in early life (UNICEF, 2022). In Nigeria, the burden of malnutrition among children is particularly alarming, with recent estimates indicating that over 5.4 million children are at risk of acute malnutrition, and approximately 1.8 million may suffer from severe acute malnutrition by 2025 (Save the Children, 2024). Nigeria has the second highest burden of stunted children in the world, with a national prevalence rate of 32 percent of children under five (WHO, 2024), and according to 2023-24 Nigeria Demographic and Health Survey (NDHS), the North-West zone has the highest prevalence rate of 54%-57% of stunted children, (under 5s) (NDHS, 2024). This crisis is exacerbated by socioeconomic disparities, food insecurity, Farmer-Herder Clashes and Banditry, inadequate health services, and poor dietary practices, especially in northern regions such as Kaduna State (Nathan *et al.*, 2025; Mustafa, 2019). Kaduna is one of the states where large populations are experiencing high food consumption gaps due to conflict and economic shocks (FAO, 2025). As of late 2024, Kaduna State alone accounted for over 1.7 million people in the Critical Phases (IPC Phases 3 to 5) of Food and Nutrition Insecurity (FNI) (FSC, 2024). The school-age is the active growing phase of childhood and a dynamic period of growth and development when children undergo physical, mental, emotional and social changes (Quadri *et al.*, *2023*). School-age children also represent a critical demographic whose nutritional status directly influences cognitive development, academic performance, and long-term health outcomes (Akanbi and Fadupin, 2022). Despite advocacy for nutrition and health services in primary schools, there is a clear lack of data on the actual nutritional status of children in this age group in developing countries and countries in transition (Onyango *et al.*, 2022). Yet, most national nutrition surveys focus on children under five, leaving a gap in data and understanding for older children (Abubakar *et al.*, 2024). This study would further justify whether there is existence of null hypothesis or otherwise, which states that; there is no significant prevalence of undernutrition among school-age children. Therefore, this study aims to bridge that gap by assessing the prevalence and determinants of malnutrition among school-age children in

Sabon Gari LGA, thereby contributing to the evidence base needed for effective public health planning.

MATERIALS AND METHODS

Study Area

Sabon Gari LGA is one of the twenty-three Local Governments in Kaduna State; it is located between latitude 11^0 06' 60.00' N and a longitude of 7^0 43' 59.99' E and covers a land area of about 191.0 square kilometers with a projected population of 430, 500 as at 2006 by the Nigeria Census, National Population Commission of Nigeria, (NPC, 2022). It is divided into eleven administrative areas called wards (Umar *et al.,* 2019). They are Anguwan Gabas, Basawa, Bomo, Chikaji, Dogarawa, Hanwa, Jama'a, Jushin waje, Muchia, Samaru, and Zabi (Umar *et al.,* 2019). The predominant tribes are Hausa, Fulani, Yoruba, Igbo and other tribes.

Study design Sample size and Sampling Technique

The study was a school-based multistage cross-sectional study of school-age children in Sabon Gari LGA, Kaduna State. Sample size was determined using the Cochran formular (Cochran, 1963), where $n= Z^2pq/e^2$; n= sample size; Z= linked to 95% confidence interval for cluster sampling (1.96); p= estimated prevalence of underweight children under-five in Kaduna State is 34.0% (NNHS, 2018) = 0.34; q= compliment probability, 1-p = 1-0.34= 0.66; e= relative desired proportion/ desired precision level = 0.05; taking a design effect of 1 and 5% non-response rate, the total sample size is 362. A Multistage sampling technique was adopted; the Local Government Area was stratified into North and South. The following wards are stratified (based on geographical location) to the north; Samaru, Basawa, Bomo, Hanwa, Jushin Waje and Muchia. While Jama'a, Chikaji, Dogarawa, Unguwan Gabas and Zabi are stratified to the south (NPC, 2016). Muchia (North) and Jama'a (South) wards were randomly selected, four primary schools (two private and two public primary schools) that are mostly populated in the study area were selected from each ward; Only 297 pupils consented and assented.

Number of study subjects selected from each school was determined by dividing the total number of study subjects by the total number of schools (4) selected; this gave a round figure of 74 pupils per primary school. The study subjects in each primary school, were selected by dividing total number of study subjects in each primary by the number of basic classes (1-6); this also gave a round figure of 12 pupils per basic class.

Field data collection

Study protocol was approved by the ethical committee of Ahmadu Bello University Zaria (with an approval number; ABUCUHSR/2024/028), and Kaduna State Universal Basic Education Board, while permission was sought from the head teachers of the schools.

Informed consent forms were obtained from the parents/guardian of the pupils while assent was sought verbally from older pupils (7-12 years). School-age children who refused to consent, those who were absent at the time of data collection and those who were sick requiring hospitalization at the time of data collection, were excluded from the study. Data was collected using semi-structured validated questionnaire (validated by an expert in nutrition and also pretested), to determine the socio-demographic status of the children.

Inter-/ Intra Rater Reliability

All trainees used same measurement techniques and were consistent with their repeated measurements at the time of data collection.

Data Management

Data collected were reviewed for completeness, accuracy and consistency before the commencement of analysis. Missing data/values were carefully reviewed and excluded. The cleaned dataset was used for analysis.

Determination of Anthropometric Indices

Measurements of height and weight were taken in triplicate and obtained an average, according to the guidelines of the Food and Nutrition Technical Assistance, FANTA/FHI360 Guide. Age was determined using the class register. The weight of each child (wearing a light cloth and bare footed) was measured using the standing electronic weighing scale and the values were recorded to the nearest 0.1kg. Height was measured using a fabricated manual stadiometer with values recorded to the nearest 0.1cm (Kristen, 2018).

Body Mass Index (BMI)

BMI was calculated as a ratio of the subject's weight (in Kg) to the square of height (in meters).

Anthropometric data of weight, height and BMI were converted to weight-for-age (WAZ), height-for-age Z scores (HAZ), and BMI-for-age Z scores (BAZ) using WHO Anthro Plus Version 1.0.4.

Statistical Analysis

The anthropometric indices Z-scores of height-for-age, weight-for-age, body mass index (BMI)-for-age as well as the prevalence of stunting, underweight and wasting were analyzed and calculated using the WHO Anthro Plus Software version 1.0.4 (Kristen, 2018). Data was analyzed using the statistical package for the social sciences (SPSS, version 22). Descriptive statistics and Chi-Square were used to summarize data (as frequencies, percentages or as means ±standard deviations) and find the association between variables.

RESULTS AND DISCUSSION

The socio-demographic characteristics of school-age children in Sabon Gari LGA, Kaduna State is shown in Table 1. Socio-demographic analysis revealed that 86.2% of the children attend public schools. Gender balance was observed, with 49.8% males and 50.2% females. The majority of the school-age children belong to the Hausa ethnic group (73.8%), followed by Fulani (12.4%), Yoruba (4.8%), and Igbo (4.8%) ethnic groups. Regarding fathers' Occupation, 7.1% of the children's fathers are farmers, 19.3% involved in trading/business, 42.5% are civil servants and 31.1% are found in other occupations. Looking at mothers' occupation, 12.9% of the children's mothers are housewives, 2.7% are farmers, 46.6% engaged in trading, 22.1% are civil servants and 15.6% engaged in other occupations. Regarding household size, 14.1% of the children were from households with fewer than 5 members, 49.2% were from households with 6-10 members, 24.9% were from households with 11-15 members, finally, 11.8% were from households with more than 15 members.

Table 1: Socio-Demographic Characteristics of the School-Age Children in Sabon Gari LGA, Kaduna State

Socio-Demographic Variables		Public School	Private School	All Schools
		n (%)	n (%)	n (%)
		256(86.2)	41(13.8)	297(100)
Age	6–9 years	44 (86.3)	9 (13.7)	53 (17.8)[1]
	10 - 12 years	212(86.9)	32(13.1)	244(82.2)[2]
Sex	Male	123(83)	25(17)	148(49.8)
	Female	133(89.2)	16(10.8)	149(50.2)
Ethnicity	Hausa	199(90.7)	20(9.3)	219(73.8)
	Fulani	31(83.3)	6(16.7)	37(12.4)
	Yoruba	9(64.3)	5(35.7)	14(4.8)
	Igbo	9(64.3)	5(35.7)	14(4.8)
	Others[3]	8(66.7)	4(33.3)	12(4.1)
Father's Occupation	Farming	17(81)	4(19)	21(7.1)
	Trading/Business	52(91.2)	5(8.8)	57(19.3)
	Civil Servant	98(77.5)	28(22.5)	126(42.5)
	Others[4]	88(95.7)	4(4.3)	92(31.1)
Mother's Occupation	House wife	35(92.1)	3(7.9)	38(12.9)
	Farming	8(2.7)	0(0)	8(2.7)
	Trading/Business	126(91.2)	12(8.8)	138(46.6)
	Civil Servant	45(69.2)	20(30.8)	66(22.1)
	Others[5]	41(89.1)	5(10.9)	46(15.6)
Number in a Household	<5 members	33(78.6)	9(21.4)	42(14.1)
	6 - 10 members	122(83.6)	24(16.4)	146(49.2)
	11 - 15 members	69(93.2)	5(6.8)	74(24.9)
	more than 15 members	32(91.4)	3(8.6)	35(11.8)

[1 and 2] the skewedness towards older children (10-12 years) was due the higher participation rate of pupils from the upper basic classes.
[3] Idoma, Nupe, Tiv, Ebira, Kanuri,Gbagyi.
[4 and 5] Mechanics, Tricycle Riders, Food Vendors, Butchers, Fashion Designers, Welders, Barbers and Hairdressers.

Table 2 presents the mean weight and height of school-age children in Sabon Gari Local Government Area (LGA) in Kaduna State. In the total population (combining both public and private schools), the average weight is approximately 25.8 kilograms, with a standard deviation of 5.8 kilograms. The weight measurements range from a minimum of 18 kilograms to a maximum of 53 kilograms, indicating the minimum and maximum weights recorded among the children in the respective categories. In the total population, the average height is approximately 130.4 centimeters, with a standard deviation of 11.1 centimeters. This represents the average height for all school-age children in Sabon Gari LGA, including both public and private school students.

Table 2: Mean Weight and Height of School Age Children in Sabon Gari LGA, Kaduna State

Anthropometric Variables	Public Schools	Private Schools	All Schools		
	Mean ± SD	Mean ± SD	Mean ± SD	Min.	Max.
Weight (kg)	25.6±5.4	29.6±9.1	25.8±5.8	18	53
Height (cm)	130.4±10.4	134.4±8.5	130.4±11.1	23.8	153

SD- Standard Deviation, Min.-Minimum, Max.-Maximum, LGA-Local Government Area

Table 3 presents the distribution of anthropometric measures among school age children in Sabon Gari, categorized by sex. Anthropometric indicators of Weight-for-Age Z score (WAZ) indicated that 25.2% of the children were moderately underweight (< -2 Z score) and 1.4% were severely underweight (< -3 Z score), Height-for-Age Z score (HAZ) showed that 26.6% were moderately stunted (< -2 Z score) and 11.8% were severely stunted (< -3 Z score). BMI-for-Age Z score (BAZ) revealed that 15.5% exhibited moderate thinness (< -2 Z score) and 10.4% were severely thin (< -3 Z score).

Table 3: Distribution of the Anthropometry Measures of the SAC in Sabon Gari LGA According To Sex

Variables		Sex			
		Male	Female	Total	Chi-square test
		n (%)	n (%)	n (%)	p-value
WAZ	Normal (≥-2 Z-score)	34(65.4)	18(34.6)	53(37.1)	0.009*
	Mild Underweight (<-1 Z-score)	26(50.0)	26(50.0)	52(36.4)	
	Moderate Underweight (<-2 Z-score)	11(31.4)	24(68.6)	36(25.2)	
	Severe Underweight (<-3 Z-score)	2(100.0)	0(.0)	2(1.4)	
HAZ	Normal (≥-2 Z-score)	48(54.5)	40(45.5)	89(30.0)	0.265
	Mild Stunting (<-1 Z-score)	51(54.3)	43(45.7)	94(31.6)	
	Moderate Stunting (<-2 Z-score)	33(42.3)	45(57.7)	79(26.6)	
	Severe Stunting (<-3 Z-score)	15(42.9)	20(57.1)	35(11.8)	
BAZ	Normal (≥-2 Z-score)	58(53.2)	51(46.8)	110(37.0)	0.369
	Mild Thinness (<-1 Z-score)	47(43.1)	62(56.9)	110(37.0)	
	Moderate Thinness (<-2 Z-score)	25(54.3)	21(45.7)	46(15.5)	
	Severe Thinness (<-3 Z-score)	17(54.8)	14(45.2)	31(10.4)	

* The Chi-square statistic is significant at the .05 level

Table 4 provides information on the distribution of anthropometry indices among school-age children in Sabon Gari, categorized by school type. Looking at both schools, 71 children (79.8%) in public schools and 18 children (20.2%) in private schools have a normal height-for-age. The total number of children with normal height-for-age is 89 (30.0% of the total). In the "Mild Stunting (< -1 Z-score)" category, 84 children (89.4%) in public schools and 10 children (10.6%) in private schools have mild stunting. The total number of children with mild stunting is 94 (31.6% of the total). In the "Moderate stunting (< -2 Z-score)" category, 72 children (91.1%) in public schools and 7 children (8.9%) in private schools have moderate stunting. The total number of children with moderate stunting is 79 (26.6% of the total). Whereas, in the "Severe stunting (< -3 Z-score)" category, 29 children (82.9%) in public schools and 6 children (17.1%) in private schools have severe stunting. The total number of children with severe stunting is 35 (11.8% of the total).

However, considering BAZ (Body Mass Index-for-Age Z-score), in the "Normal" category, 89 children (80.9%) in public schools and 21 children (19.1%) in private schools have a normal body mass index for age. The total number of children with a normal body mass index is 110 (37.0% of the total). Also, 99 children (90.0%) in public schools and 11 children (10.0%) in private schools were classified as thin. The total number of thin children was 110 (37.0% of the total). Moderate thinness (<-2 Z-score) show that 41 children (89.1%) in public schools and 5 children (10.9%) in private schools have moderate thinness. The total number of children with moderate thinness is 46 (15.5% of the total). Whereas, 27 children (87.1%) in public schools and 4 children (12.9%) in private schools have severe thinness. The total number of children with severe thinness is 31 (10.4% of the total).

Table 4: Anthropometric Indices of School Age Children in Sabon Gari LGA According To School Type

Variables		School Type[1]			
		Public n (%)	Private n (%)	Total n (%)	Chi-square p-value
WAZ	Normal	41(77.4)	12(22.6)	53(37.1)	0.020*
	Mild Underweight (<-1 zscore)	48(92.3)	4(7.7)	52(36.4)	
	Moderate Underweight (<-2 zscore)	35(97.2)	1(2.8)	36(25.2)	
	severe Underweight (<-3 zscore)	2(100.0)	0(.0)	2(1.4)	
HAZ	Normal	71(79.8)	18(20.2)	89(30.0)	0.120
	Mild Stunting (<-1 zscore)	84(89.4)	10(10.6)	94(31.6)	
	Moderate Stunting (<-2 zscore)	72(91.1)	7(8.9)	79(26.6)	
	Severe Stunting (<-3 zscore)	29(82.9)	6(17.1)	35(11.8)	
BAZ	Normal	89(80.9)	21(19.1)	110(37.0)	0.233
	Thinness (<-1 zscore)	99(90.0)	11(10.0)	110(37.0)	
	Moderate Thinness (<-2 zscore)	41(89.1)	5(10.9)	46(15.5)	
	Severe Thinness (<-3 zscore)	27(87.1)	4(12.9)	31(10.4)	

WAZ- Weight for Age Z-scores, HAZ- Height for Age Z scores, BAZ- BMI for Age Z scores
n (%) =297, *results are significant at p<0.05

Table 5 presents the distribution of anthropometric measures among school-age children in Sabon Gari according to different age groups, highlighting variations in nutritional status across age categories. Among children aged 6-7 years, 3.8% have a normal weight-for-age, while none fall into the mild, moderate, or severe underweight categories. In the 8-9 years age group, 64.2% have normal weight, while 23.1% are mildly underweight and 13.9% are moderately underweight.

In the 10-12 years age group, 32.1% exhibit normal weight, while 76.9% are mildly underweight and 86.1% are moderately underweight. A significant association exists between age and weight-for-age status ($p < 0.001$), indicating differences in nutritional status across age categories.

For children aged 6-7 years, 1.1% has normal height-for-age, while 1.1% exhibit mild stunting and none are moderately or severely stunted. In the 8-9 years age group, 39.3% have normal height, 10.6% have mild stunting, and 6.3% have moderate stunting. Among children aged 10-12 years, 59.6% have normal height, 88.3% are mildly stunted, and 93.7% are moderately stunted. Age is significantly associated with height-for-age status ($p < 0.001$), indicating variations in stunting prevalence across age groups.

In the 6-7 years age group, 0.9% have normal BAZ, 8.2% exhibit thinness, and none are moderately or severely thin. Among children aged 8-9 years, 34.5% have normal BAZ, 8.2% show thinness, and 8.7% exhibit moderate thinness. For the 10-12 years age group, 64.5% have normal BAZ, 90.9% are thin, and 91.3% show moderate thinness. Age significantly influences body mass index-for-age status ($p < 0.001$), indicating differences in thinness prevalence across age categories.

Table 5: Distribution of the Anthropometry Measures of the School Age Children in Sabon Gari According To Age

Variables		Age			
		6 - 7 years	8 - 9 years	10 - 12 years	Chi-square
		n(%)	n(%)	n(%)	p-value
WAZ	Normal	2(3.8)	34(64.2)	17(32.1)	0.000*
	Mild underweight(>-1 zscore)	0(.0)	12(23.1)	40(76.9)	
	Moderate underweight (>-2 zscore)	0(.0)	5(13.9)	31(86.1)	
	severe underweight (>-3 zscore)	0(.0)	0(.0)	2(100.0)	
HAZ	Normal	1(1.1)	35(39.3)	53(59.6)	0.000*
	Mild Stunting (>-1 zscore)	1(1.1)	10(10.6)	83(88.3)	
	Moderate stunting (>-2 zscore)	0(.0)	5(6.3)	74(93.7)	
	severe stunting (>-3 zscore)	0(.0)	1(2.9)	34(97.1)	
BAZ	Normal	1(.9)	38(34.5)	71(64.5)	0.000*
	thinness (>-1 zscore)	1(.9)	9(8.2)	100(90.9)	
	Moderate thinness (>-2 zscore)	0(.0)	4(8.7)	42(91.3)	
	severe thinness (>-3 zscore)	0(.0)	0(.0)	31(100.0)	

Discussion

Malnutrition among school-age children is still a significant public health issue, especially in developing countries like Nigeria which has a lot of socioeconomic disparities. This study was conducted in Sabon Gari Local Government Area of Kaduna State, Nigeria, and focuses on the nutritional status of children during an important stage of growth and development it gives insight into the incidence and patterns of malnutrition within this vulnerable population.

The age distribution of school age children in the Sabon Gari area appears to follow a typical pattern. Most children fall within the 10-12 years age range, which is in line with the generally recognized definition of primary school ages (WHO, 2021). This trend is consistent with demographic studies that often report the highest enrollment in primary education for children around 10 years old (UNESCO, 2023). The study shows a relatively balanced distribution of males and females among school-age children. Gender parity in education has been a goal in many countries, and efforts to ensure equal access to education for both boys and girls have increased in recent years (The Global Gender Gap Report, 2024). The nearly equal representation of males and females in this table could be seen as a positive sign of gender equity in education.

Gender equity in education is not only a matter of access to knowledge but also plays a significant role in improving nutrition outcomes. Research has shown that education, particularly for girls, is associated with better nutrition and health outcomes. Girls who attend school are more likely to have access to essential nutrition information, which, in turn, affects their dietary choices and the nutritional well-being of their families (Smith and Haddad, 2015). This underlines the critical link between education, especially for females, and improved nutrition.

The predominance of public school attendance among the surveyed children (86.2%) aligns with the general trend in many low and middle-income countries where public education is often more accessible due to lower costs (UNESCO, 2020). Public schools typically provide various services, including school feeding programs and health education, which can positively influence the nutritional status of students.

The significant gender balance observed in this study is consistent with national statistics, highlighting that both male and female children are equally represented in schools (World Bank, 2020). This gender balance is crucial in the context of nutrition, as it ensures that both boys and girls have an equal opportunity to benefit from education's impact on nutrition and health (Global Nutrition Report, 2022). The distribution of children across different ethnic groups in the area is an important socio-demographic characteristic. Ethnicity can influence educational access and attainment due to cultural factors and socioeconomic disparities. For example, studies like the UNESCO Global Education Monitoring Report highlight the impact of ethnicity on educational disparities, emphasizing the need for inclusive policies that cater to the needs of different ethnic groups (UNESCO, 2020).

The distribution of parents' occupations provides insights into the economic backgrounds of the children's families. The prominence of civil servant parents could suggest a significant public sector presence in the area, potentially affecting the socioeconomic status of families. Research by economists like James Heckman emphasizes the role of parental education and occupation in shaping children's outcomes, including their access to quality education (Heckman and Mosso, 2014).

Concerning household size, the distribution of household sizes is a critical indicator of living conditions and potential economic challenges. Larger households might face more constraints related to resources, including education-related expenses. This aligns with research on household size and poverty dynamics. Scholars like Amartya Sen have highlighted how family size can affect the allocation of resources, including education (Amartya, 2007).

The variation in average weight and height between public and private school students underscores the potential

influence of socio-economic factors on nutritional status, which could be as a result of moderate and low income of the household head of the study area. This could also be attributed to the location of the school which mostly are found in sub-Urban areas (UNICEF, 2019).

The high prevalence of underweight and stunting, especially among older children, echoes concern about malnutrition's persistent impact on child growth and development in low-resource settings (Black *et al.*, 2013). The distribution of anthropometric measures based on sex among school age children in Sabon Gari, offers insights that align with findings from various other studies exploring the association between nutritional status and gender differences in diverse settings. A study by Ahmed *et al*. (2019) conducted in a similar context found that male children exhibited a higher prevalence of underweight compared to female children, in line with the higher percentage of moderate underweight observed among males in this study. Similarly, the higher prevalence of moderate and severe stunting among females aligns with the results of a study by Khan and Raza (2017), where girls had a higher likelihood of experiencing stunting compared to boys. However, the non-significant differences in height-for-age and body mass index-for-age between sexes in this study are consistent with the findings of de Onis and Bianca (2016), who emphasized that gender disparities in nutritional indicators can vary widely across regions.

CONCLUSION

Comprehensive analysis of socio-demographic, anthropometric factors among school-age children in Sabon Gari, Kaduna State, offers valuable insights into their lives and well-being. The prevalence of public-school attendance, gender balance in education, and ethnic diversity among the surveyed children reflect the dynamics of educational access in many developing regions. Public schools tend to dominate due to their affordability, while the even distribution of gender highlights the commitment to equal educational opportunities. Anthropometric measurements reveal differences in nutritional health, highlighting the importance of combating underweight, stunting and thinness/wasting. Findings provide valuable insights for tailored strategies aimed at improving school-based nutrition education and monitoring, the nutritional outcomes of school-age children in public schools in Sabon Gari LGA, Kaduna State.

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