

# Nutritional Status of Children Below Five Years in a Rural Community in Ogun State, Nigeria

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## ABSTRACT

**Background and purpose of study:** Adequate early nutrition exerts a long-lasting effect on the physical, cognitive, emotional, and social development of children. Children who dwell in rural communities are at increased risk of developing malnutrition resulting from the consumption of food low in quality and quantity, deficient, and incessant infections. Ultimately, a vicious cyclical relationship between poverty and malnutrition ensues, with a resultant transgenerational inequality in the health indices of the community. This study aims to determine the nutritional status of under-five children in a rural community in Ogun State.

**Methods:** This community-based cross-sectional study was conducted in Imala, Abeokuta, Ogun State. Three hundred and twelve children aged between 1 and 59 months who met the inclusion criteria were recruited for the study. The socio-demographic characteristics were recorded in the proforma designed for the study. Anthropometric measurements of weight, height/length, and MUAC were obtained and interpreted using the WHO reference data. Participants were examined for the presence of bilateral pedal oedema.

**Results:** The prevalence of severe acute malnutrition, moderate acute malnutrition, overweight, and obesity was 7.7%, 8.3%, 7.1%, and 4.1%, respectively. A higher proportion of females (62%) experienced acute malnutrition compared to the male subjects (38%). Majority (53.8%) of the subjects with stunting are males and belong to the 24-59 age group.

**Conclusions:** This study demonstrates a high prevalence of undernutrition-stunting and acute malnutrition as well as overnutrition-overweight/obesity among under-fives living in a rural community in Nigeria and contributes to the existing body of knowledge of the growing prevalence of double burden malnutrition in Low- and Middle-Income Countries. Appropriate nutrition is essential for optimal growth and development. Therefore, collective actions of all stakeholders are important in preventing the various manifestations of malnutrition and their attendant complications, not only in this community but in Nigeria at large.

**Keywords:** Stunting, Severe Acute Malnutrition, Moderate Acute Malnutrition, Obesity, Double Burden Malnutrition

## INTRODUCTION

Nutrition is one of the determinants of the health status of children. Appropriate nutrition in the first five years of a child's life provides the essential building blocks for healthy growth, brain development, and a strong immune system.<sup>[1]</sup> Poor nutrition, both in quantity and quality, can result in malnutrition.<sup>[2]</sup> Malnutrition in children is a public health challenge, and it is particularly pronounced in Low- and Middle-Income Countries (LMIC).<sup>[3]</sup> Some studies in LMIC indicate that stunting and wasting are highly prevalent; recent studies have

reported high prevalence of childhood obesity and its consequences, suggesting an increasing prevalence of the double burden malnutrition. [4–8] 4-8

Children under five years of age are more vulnerable to malnutrition on account of increased demand for food needed for growth and development, and increased prevalence of various types of infections and infestations. [3]

<sup>3</sup> Several factors contribute to malnutrition in this age group, including inappropriate feeding practices, ignorance, and poverty. [9] A vicious cycle exists between poverty and malnutrition. Malnutrition disproportionately affects children who reside in rural communities and are of low socioeconomic backgrounds. These children are more susceptible to having malnutrition resulting from frequent infections, poor hygiene, and inadequate dietary consumption.

Malnutrition in children under the age of five years has enormous, debilitating physical and psychosocial consequences in the immediate and long-term periods. These consequences may continue into adulthood with intergenerational outcomes. Therefore, this study aims to determine the nutritional status of under-five children in a rural community in Ogun State.

## METHOD

This was a community-based cross-sectional study carried out in Imala in Abeokuta North Local Government Area (LGA) of Ogun State between April and June 2019. Imala is one of the 16 wards of the LGA with a total population of 19,723. The study population included children between 1 and 59 months who constituted 25% of the population. The minimum sample size calculated was 312. Ethical clearance was obtained from the Health Research Ethics Committee of Federal Medical Centre, Abeokuta. Using the systematic random sampling technique, children between 1 and 59 months were recruited for the study until the sample size was obtained. Permission was obtained from the traditional ruler and His chiefs, and consent was obtained from the parents.

Anthropometric data were obtained by direct measurements of the weight, length/height, and Mid Upper Arm Circumference (MUAC) following standard WHO protocol.<sup>[10]</sup> <sup>10</sup> The weight was measured using a digital weighing scale in kilograms to the nearest 100g, while the length and height were measured using a measuring board and wall-mounted stadiometer, respectively, to the nearest 1mm. The MUAC was measured using a stretch-resistant measuring tape to a precision of 0.1cm. The anthropometric measurements were interpreted using the WHO growth standards as thus:

Normal length/height for age- Length/height for age z-score  $<+2$  and  $>-2$  SD of the median

Stunting- Length/Height for age z-score  $\leq -2$  and  $\geq -3$  SD of the median

Severe stunting- Length/Height for age z-score  $< -3$  SD of the median

Normal weight-for-length/height: Weight-for-length/height z-score  $\leq +2$  and  $\geq -2$  SD of the median

Moderate Acute Malnutrition: Weight-for-length/height z-score  $\leq -2$  and  $\geq -3$  SD of the median; or MUAC  $\geq 115$ mm and  $< 125$ mm

Severe Acute Malnutrition (SAM): Weight for length/height z-score  $< -3$  SD of the median; or MUAC  $< 115$ mm; or Bilateral pedal edema

Overweight: Weight-for-length/height z-score  $> +2$  and  $\leq +3$  SD of the median

Obesity: Weight-for-length/height z-score  $> +3$  SD of the median

## RESULTS

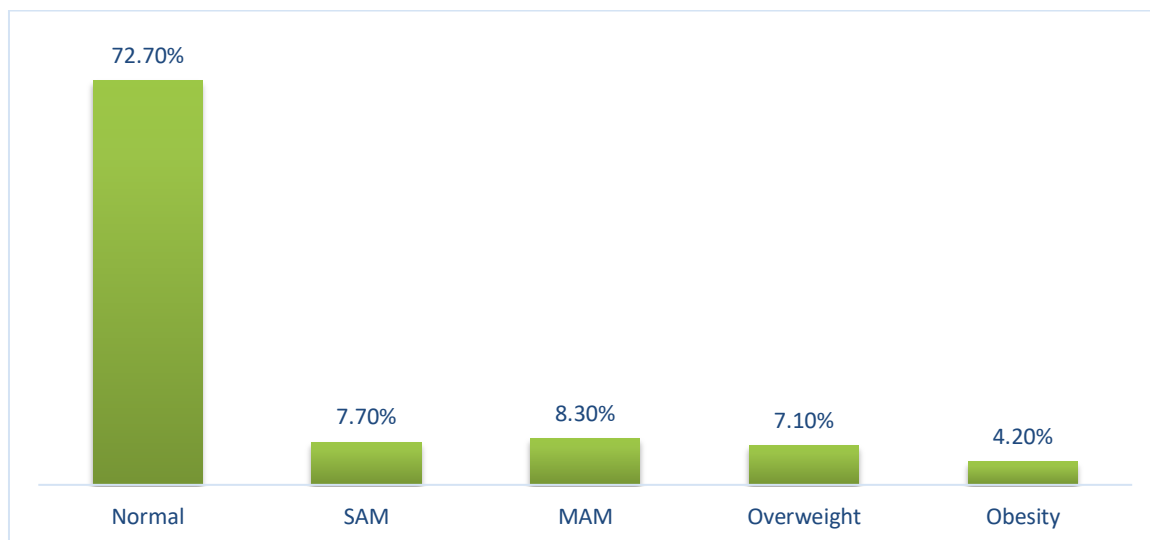
### Characteristics of the subjects

Three hundred and twelve children aged 1-59 months participated in the study. Most subjects, 130 (41.5%), were of the 24-59 age group. More than half (56%) of the subjects were male. 73% of the participants were of low socio-economic status. (Table 1)

Table 1: Socio-demographic characteristics of the study participants

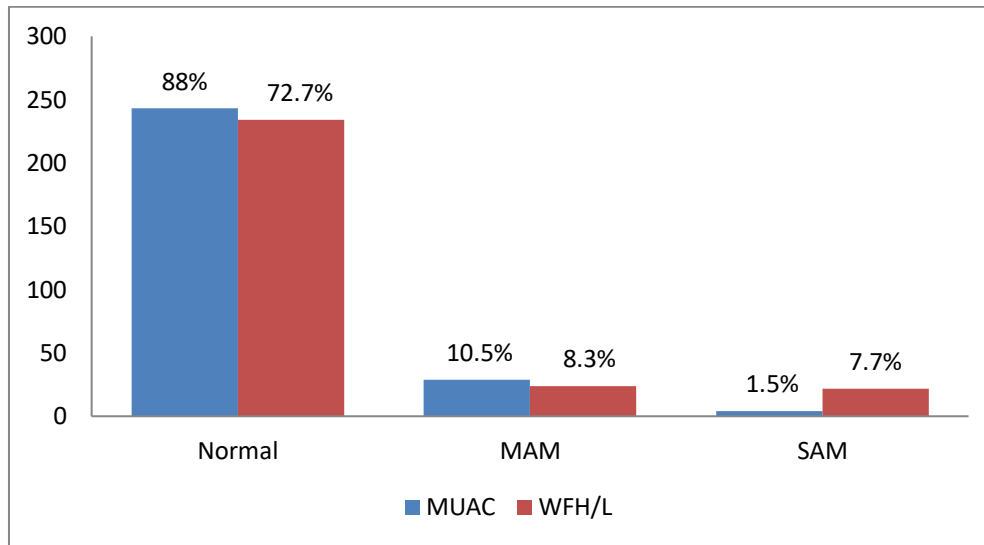
Variable	Frequency	Percent (%)
<b>Age (months)</b>		
< 6	38	12.2
6 - 11	50	16.0
12 – 23	83	26.6
24 – 59	141	45.2
<b>Mean ± SD</b>	24.81 ± 16.92	
<b>Median (IQR)</b>	21.00 (10.25 – 39.00)	
<b>Range</b>	1 - 59	
<b>Sex</b>		
Male	174	55.8
Female	138	44.2
<b>Social class</b>		
Low	228	73.1
Middle	84	26.9

8.3% had Moderate acute malnutrition while 7.7% had severe acute malnutrition as shown in Figure 1. 18% of the participants had stunting and 3% had severe stunting as shown in Figure III.



Key: MAM- Moderate acute malnutrition, SAM- Severe acute malnutrition

Figure 1 shows the prevalence of malnutrition among under-fives in a rural community



Key: MAM- Moderate acute malnutrition, SAM- Severe acute malnutrition, WFH/L- Weight for height/length, MUAC- Mid upper arm circumference

Figure II: Comparison of the nutritional status among under-fives in a rural community using MUAC and WFH/L

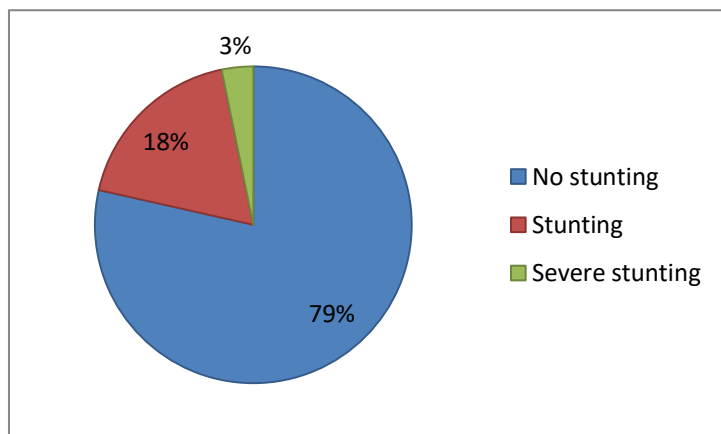


Figure III shows the prevalence of stunting among the subjects in a rural community.

There was no significant relationship between sociodemographic characteristics of the participants and undernutrition as well as between sociodemographic characteristics and stunting as shown in Tables II and III.

Table II: Association between sociodemographic characteristics and undernutrition among under-fives in a rural community

Variables	Normal-weight	MAM	SAM	Total	$\chi^2$	df	p-value
<b>Age group (in months)</b>	n (%)	n (%)	n (%)				
< 6	43 (93.5)	2 (4.3)	1 (2.2)		9.3281	3	0.155949
6-11	39 (81.3)	2 (4.1)	7 (14.6)				

12-23	64 (83.1)	6 (7.8)	7 (9.1)				
24-59	116 (82.3)	16 (11.3)	9 (6.4)				
<b>Sex</b>							
Male	116 (84.7)	11 (8)	10 (7.3)		0.0903	1	0.955854
Female	146 (83.4)	15 (8.6)	14 (8)				
<b>SES</b>							
Low	196 (82)	22 (9.2)	21 (8.8)		2.9917	1	0.224054
Middle	66 (90.4)	4 (5.5)	3 (4.1)				

Table III: Association between sociodemographic characteristics and stunting among under-fives in a rural community

Variable	No stunting	Stunting	Total	$\chi^2$	df	p-value
<b>Age group (in months)</b>	N (%)	N (%)	N (%)			
< 6	34 (89.5)	4 (10.5)	38 (12.2)	4.2331	3	0.2376
6-11	39 (78)	11 (22)	50 (16)			
12-23	68 (81.9)	15 (18.1)	83 (26.6)			
24-59	106 (75.2)	35 (24.8)	141 (45.2)			
<b>Sex</b>						
Male	140 (80)	35 (20)	175 (56.1)	1.4904	1	0.2221
Female	107 (78.1)	30 (21.9)	137 (43.9)			
<b>SES</b>						
Low	181 (79.4)	47 (20.6)	228 (73.1)	0.0247	1	0.8751
Middle	66 (78.6)	18 (21.4)	84 (26.9)			

## DISCUSSION

This study reveals the nutritional status of children below five years in a rural community, Imala, in Ogun state, Nigeria. Our finding indicates a prevalence of 18% for stunting. This prevalence is lower compared to those obtained by Abubakar et al in Tanzania; and Akinpelu et al, Omitola et al, Duru et al and Alabi et al in Nigeria but higher than those reported by Manyike et al, Akorede et al and Lemchi et al in Nigeria.<sup>4-7 [4-7], [11-13] 11-13</sup> There was a male preponderance of the prevalence of stunting in this study; this finding is consistent with the reports of Akinpelu et al and Manyike et al in Nigeria.<sup>[5,12] 5, 12</sup>

The prevalence of severe stunting is 3% in this study. This is at variance with studies by Akinpelu et al and Alabi et al in southwest, Nigeria.<sup>[5,11] 5, 11</sup> Stunting has a long-lasting impact not only on the children but also the society at large. This includes low academic attainment, cognitive impairment and reduced productivity even in

adulthood. Mid Upper Arm Circumference is an economical, time-and labour-saving tool of detecting acute malnutrition in children. The prevalence of SAM as identified by MUAC is 1.5%. Our findings further indicate that 7.5% children had SAM as detected by the weight-for-length/height z-scores. The reason for this disparity is not clear. The prevalence of SAM as obtained by the weight-for-length/height measure is consistent with Duru et al in Imo state, Nigeria and but not in agreement with other studies in Nigeria by Manyike in Ebonyi, Lemchi et al in Imo state, Alabi et al in Osun state, Akorede et al in Akure and Omitola in Ogun state. [6,7,11–13] 6, 7, 11-13

The outcome from this study is plausible as majority of the subjects are of the low socioeconomic background which may indicate a likelihood of compromise in the quantity and quality of food intake, poor housing conditions, as well as lack of potable water, and subsequently development of undernutrition. We found the prevalence of overweight and obesity to be 7.1% and 4.2% respectively. A higher prevalence of overweight and obesity among preschool children was reported by Mekie-Okoye et al in Rivers, Nigeria.<sup>[8]8</sup> This may be reflective of the nutrition transition into consumption of processed-high fat and sugar-containing food that has also been documented in studies from other low- and middle-income countries.

In conclusion, this study indicates that the prevalence of stunting, severe acute malnutrition, and overweight/obesity is high in this rural community. Collaborative efforts of all stakeholders are needed to halt the progression of the prevalence of the various manifestations of malnutrition, not only in this community but in Nigeria at large.

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## Ethical Approval

Ethical approval was obtained from the Health Research Ethics Committee of Federal Medical Centre, Abeokuta

## Conflict Of Interest

We declare no conflict of interest

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