

Assessment of Nutritional Status of Children Under-Five Years in Ido-Osi Local Government Area, Southwest Nigeria

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ABSTRACT

Background: Malnutrition in children under-five years is a major public health problem and a leading cause of morbidity and mortality in developing countries.

Objective: To assess the nutritional status and pattern of infant feeding practices of under-five years children in Ido-Osi Local government Area, Ekiti State, South west, Nigeria.

Methods: A cross-sectional study was carried out to assess the nutritional status of 419 children aged 0-59 months. Respondents were selected from Primary Health Care centers and nursery and primary schools in the study area using simple random sampling technique. Data on demographic profile and feeding pattern of the under-five were obtained from their Mothers using interviewer-administered questionnaire while anthropometric measurements of the children were taken. Data collected were analyzed using World health Organization (WHO) Anthro package for under five and Statistical Package for Social Sciences (SPSS) version 20.

Results: A total of 419 children; 281(52.0%) males and 201 (48.0%) females aged 0-59 months were enrolled into this study. Of the under-five assessed 34(8.11%) were underweight, 67(15.99%) were stunted while 34(8.11%) were wasted. A total of 31(88.6%) mothers practiced exclusive breastfeeding for 0-6months, 42(48.84%) practiced early initiation of breastfeeding between 30-60minutes after delivery according to WHO standard. Underweight, wasting and stunting were 12.12%, 9.09%, 31.82% and 15.0%, 20.0%, 35.0% among children exclusively breastfed and those who were not respectively.

Conclusion: Malnutrition especially stunting rate was high in the study area but low among children exclusively breastfed. Nutrition programs on appropriate feeding practices to promote good nutritional status is recommended.

Keywords: Nutrition, Assessment, Stunting, Underweight, breastfeeding

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INTRODUCTION

Malnutrition is a major cause of nearly half of all deaths in children under-five years (1, 2). Undernutrition puts children at greater risk of dying from common infections, increases the frequency and severity of such infections, and delays recovery (2). Malnutrition being a public

health issue also hinders economic growth, productivity and the eradication of global poverty (3). It is an important indicator for tracking nutritional status and survival (4), it is commonly caused by maternal malnutrition, poor feeding and care practices (such as; inadequate

breastfeeding, offering the wrong foods, and inadequate nutritious food (5), infection exacerbated by food insecurity, limited access to safe drinking water, and poverty) (2). Adequate nutrition is a child's right and it is critical for a child's healthy growth and development (6, 7).

Nigeria has one of Africa's highest rates of under-nutrition (3). The 2018 Nigeria Demographic and Health Survey (NDHS), revealed that of the children under five years 19.2% are stunted, 8.3% are wasted while 18.6% are underweight. The under-five mortality rate in Nigeria is 132/1000 which is among the world's highest (8). Malnutrition is a silent source of 3.5 Million deaths globally and responsible for 35% of Morbidities among children under-five (9). Common forms of under-nutrition in children include underweight, wasting, and stunting (9). Two-third (66%) of under-five children in Nigeria suffered from under-nutrition in 2018 (3).

Acute nutritional deficit and/or disease (such as diarrhoea) produce wasting (low weight-for-height/arm circumference). Prolonged nutritional deficit and/or disease result in stunting (low height-for-age) a key indicator of chronic under-nutrition (10).

Stunting has been associated with increased morbidity and mortality, cognitive impairment, low social-economic status in adulthood and risk of acquiring communicable and non communicable diseases (11). Globally, more than one in four children under the age of five years are too short for their age. Sub-Saharan Africa and South Asia suffer the heaviest burden, with 75% of the world's stunted children. Low height-for-age or stunting reflects a failure to reach a minimal stature associated with current and future healthy development and is a key indicator of chronic under-nutrition (10).

Feeding patterns affect growth and nutritional status in children (12). A study demonstrated that the infant and child feeding index had a significant association with weight, height, height-for-age Z-Score and weight-for age z-score (13).

Considering the negative effects of under-nutrition on children under-five as mentioned above the objective of this study was therefore to assess the nutritional status of under-five years

children in Ido Local government Area, Ekiti State, South west, Nigeria. We are not aware of any study of this nature from this environment. It is hoped that this will add to the body of knowledge available on these disorders and the findings of this study could form the template for intervention strategies in reducing this social malaise and managing such cases.

MATERIAL AND METHODS

Study Design

This is a cross-sectional study that assessed the nutritional status and associated factors among children aged 0-5 years attending primary health care centers and nursery and primary schools.

Study Area and Period

The study was conducted in five towns in Ido/Osi local government area, Ekiti State. The State is geopolitically divided into three senatorial districts; Ekiti Central, Ekiti North, and Ekiti South Senatorial District (14). Ido Osi local government area is one of the five LGAs in Ekiti North senatorial district in Ekiti State, Southwest Nigeria. The projected population of Ido Osi local government is 218,100. The study was carried out between September and November, 2022.

Study population and study procedure

Study populations were all children aged 0-5 years attending randomly selected five Primary Health Care centers for child welfare clinic and ten nursery and primary schools in Ido-Osi LGA. Written Consent and approval were given by the school authorities and primary health care centre management where this study was carried out while verbal consent was obtained from parents of the pupils and the under-five. Confidentiality of responses was conveyed.

Sample Size and Sampling Strategy

A total of 419 children 0-5years in Ido-Osi LGA, Ekiti State participated in the study. Children from Nursery and primary Schools and Primary Health Care centers whose management and parents willingly gave their consent to participate were included in the study. Simple random sampling technique and systematic sampling technique were employed for selecting the respondents. There are 18 towns and villages in Ido Osi LGA,

out of which 5 that are representative of the whole LGA were selected using simple random sampling technique. The selected towns were; Ido, Ifaki, Usi, Igbole and Ora Ekiti from which eight public nursery and primary schools and two private nursery and primary schools were randomly selected. This was because private schools in the local government are densely populated compared to public schools. A total of 333 children aged 1-5 years were selected from kindergarten one to primary one through systematic sampling technique in the schools. There are seventeen Primary health care centres in the LGA of which Six were selected through random sampling technique from where 86 children 0-2years were selected by systematic sampling technique.

Children aged 1-5 years who live and attend schools in nursery and primary schools in Ido Osi LGA whose parents, caregivers and school management gave consent and children 0-2 years whose mothers/caregivers gave consent were included in this study. Children who were seriously ill, above five years old and those whose parents did not give consents were excluded.

Data Collection Technique

Data was collected via interviewer-administered questionnaire and anthropometric measurements. At the Primary Health centers, the nutritional status of children 0-2years was assessed through anthropometric measurement of the children and Information on demographic characteristics, breastfeeding initiation, exclusive breastfeeding and duration, and complementary feeding practices were obtained using semi-structured, interviewer administered questionnaires from their mothers or caregivers while Nutritional assessment was done using anthropometry only for children 1-5 years attending the selected Nursery and Primary schools. Children were weighed and measured as per the WHO guidelines on Anthropometry. Stadiometer (Floor type model with sensitivity of 0.1 cm) was used to measure the height of the children. It typically consists of a vertical ruler with a sliding horizontal rod or paddle which is adjusted to rest on top of the head. Child's weighing scale was used to measure weight of

children at the primary health care centers while bathroom weighing scale was used to measure weight in Nursery and Primary schools. The mid arm circumference was measured with Shakir's tape while head circumference was measured with measuring tape. All measurements were carried out using appropriate instruments. Nine research assistants were trained and assisted in data collection.

Diagnostic Methods

Moderate acute malnutrition was defined as mid upper arm circumference (MUAC) of 11.5cm - <12.5 cm. Severe acute malnutrition was defined as MAUC of <11.5cm. Underweight, wasting and stunting were classified based on z-scores cut-off less than -2SD of weight for age (WAZ), weight for height (WHZ) and height for age (HAZ) respectively. Overweight and obesity was defined as weight for age (WAZ) +2SD according to WHO recommendation (15).

Data Analysis

Data collected were analysed using World health Organization (WHO) Anthro for under five package and Statistical Package for Social Sciences (SPSS) version 20 (Chicago IL). Chi-square test was used to test for significant association of the proportion. A p-value of < 0.05 was regarded as significant. All reported p-values were 2-sided.

Ethical consideration

Ethical clearance was obtained from the Federal Teaching Hospital Ido Ethical review committee with Approval number ERC/2021/08/18/622A before starting the study. Informed and written (signed) consent was obtained from parents/caregivers of the children 0-5years, the school authorities and primary health care coordinator at the Local government. Ethical conduct was maintained during data collection and throughout the research process.

RESULTS

Demography

A total of 419 children aged 0 to 5 years were enrolled into this study. Two hundred and eighteen (52.0%) were males while 201 (48.0%) were females. Children aged less than 1month,

1-3 months and 4-6months were 10(2.4%), 29(6.9%) and 12(2.9%) respectively. A total of 51(12.2%) were aged 0-6months. Eighteen (4.3%), 74(17.7%), 110(26.3%), and 116(39.6%) were 6-12months, 13-24months, 25-36months and 37-59months respectively.

Nutritional Status of Study Participants

A total of 270(64.4%) children had normal nutritional status with regards to assessment of weight for age. Under-nutrition in form of underweight <-2zscore was 34(8.1%) while 11(2.6%) had over-nutrition (overweight and obesity) >+2zscore. Thirty four children (8.1%) were wasted, 15(3.6%) had severe wasting while 67(15.99%) children were stunted, 31(7.4%) had severe stunting as shown in Table 1. Seven of the 419 children (1.7%) had acute malnutrition based on MUAC <12.5cm, 6 (1.4%) had moderate acute

malnutrition (MAM) MUAC 11.5cm -12.5cm while 1 (0.2%) had severe acute malnutrition MUAC<11.5cm. Table1

The nutritional status of the study participants according to age groups and gender was presented in Table II. Underweight was 11(15.9%) among 0-12 months and 3(2.7%) among 25-36months old. Wasting was 8(11.6%) among 0-12 months and 8(4.8%) among 37-59 months old while stunting was 21(30.4) among 0-12 months and 17(10.2%) among 37-59months old. Underweight (WAZ) was 34(8.1%); 17(7.8%) among males and 17(8.5%) among females. Wasting (WHZ) was 34(8.1%); 15(6.8%) among males and 19(9.5%) among females and while Stunting (HAZ) <-2SD was 67(15.9%); 33(15.2%) and 34 (16.9%) for males and females respectively. Table2.

Table 1. Malnutrition status of the under five years old

Malnutrition	Mild	Moderate	Severe	Total
Status	1SD n(%)	<-2SD n(%)	<-3SD n(%)	2SD +3SD n(%)
Underweight (WAZ)	66(15.8)	27(6.4)	7(1.7)	34(8.11)
Wasting (WHZ)	62(14.8)	19(4.5)	15(3.6)	34(8.11)
Stunting(HAZ)	69(16.5)	36(8.6)	31(7.4)	67(15.99)
Head circumference				
Microcephally	28(6.7)	10(2.4)	4(1.0)	14(3.34)
Macrocephally	114(27.2)	41(9.8)	18(4.3)	59(14.08)
MUAC	0(0)	6(1.40)	1(0.20)	7(1.67)

WAZ- Weight for Age ZScore, WHZ- Weight for Height Zscore, HAZ-Height for Age Zscore, MUAC- Mid Upper Arm Circumference

Table 2. Malnutrition and demographic characteristics of participants

	MUAC n(%)		Underweight n(%)		Wasting n(%)		Stunting n(%)	
	MAM	SAM	moderate	severe	moderate	severe	moderate	severe
Sex	2(0.9)	0(0)	13(6.0)	4(1.4)	7(3.2)	8(3.7)	18(8.3)	15(6.9)
Male								
Female	4(2.0)	1(0.5)	14(7.0)	3(1.5)	12(6.0)	7(3.5)	18(9.0)	16(8.0)
P-value	0.40		0.04		0.49		0.71	
Age (Months)								
<1	NA	NA	1(10.0)	0(0)	1(1.0)	0(0)	2(20.0)	2 (20.0)
1-3	NA	NA	4(13.8)	2(6.9)	2(6.9)	2(6.9)	4(13.8)	4(13.8)
4-5	NA	NA	2(16.7)	1(8.3)	0(0)	1(8.3)	1(8.3)	4(33.3)
6-12	1(5.6)	0(0)	1(5.6)	0(0)	2(11.1)	0(0)	4(22.2)	0(0)
13-24	3(4.1)	1(1.4)	8(10.8)	1(1.4)	3(4.1)	7(9.5)	4(5.4)	8(10.8)
25-36	1(0.9)	0(0)	3(2.7)	0(0)	7(6.4)	1(0.9)	9(8.2)	8(7.3)
37-59	1(0.6)	0(0)	8(4.8)	3(1.8)	4(2.4)	4(2.4)	2(7.2)	5(3.0)
P-value	0.00		0.02		0.05		0.02	

MAM- Moderate acute malnutrition, SAM – Severe acute malnutrition. Moderate malnutrition is defined as <-2SD while severe malnutrition is <-3SD according to WHO

Exclusive breastfeeding (EBF) practice for 0-6months was 31(88.6%), 0-3 months was 14(38.9%), 0-5months was 5(14.3%) of the children assessed at the health facilities. Total number of children been exclusively breastfed were 66(76.7%) according to Table 3. Early initiation of breastfeeding for the first 30-60minutes of birth was 42(48.83%).

Underweight, wasting and stunting were 12.12%, 9.09% and 31.82% among children who were exclusively breastfed and 15.0%, 20.0% and 35.0% among those not exclusively breastfed respectively. Of the children breastfed early within the first 30-60 minutes of birth (Early initiation of breastfeeding practice); underweight, wasting and stunting were 23.81%, 11.91%, and 14.29%

while among those breastfed late; underweight, wasting and stunting were 42.86%, 20.93% and 9.30% respectively.

DISCUSSION

This study analyzed, weight for height (wasting), height for age (stunting) and weight for age (underweight) as the vital anthropometric indices. Other than this, mid-upper arm circumference and head circumference were measured. This study revealed the existence of high prevalence of malnutrition, especially stunting among under-five children in the study area. In this study 8.11% were underweight and wasted while 15.9% (more than one-sixth) were stunted, <-2SD (Zscore) which needs intervention. This is lower than the

result of a study (16) and another study (17) in which underweight was 34.3%, wasting was 26.9% and stunting was 20.4% but higher than the findings of some studies (2, 14). In this study, 1.7%, 6.4%, and 15.8% of the children had severe, moderate and mild underweight respectively, 3.6%, 4.5%, and 14.8% had severe, moderate and mild wasting respectively while 7.4%, 8.6%, 16.5% had severe, moderate and mild stunting respectively.

DEMOGRAPHIC CHARACTERISTICS AND NUTRITION STATUS

Gender and Malnutrition

Underweight was significantly higher among

females (8.5%) than males (7.8%) contrary to the findings of (17) in which prevalence of underweight was more among males (21.1%) than females (15.3%). Wasting and stunting were higher among females than males, (9.5%, 6.8% and 16.9%,15.2% respectively) contrary to the findings of two studies study (18), and another (17) in which prevalence of wasting was more (30.5%) among males than females (22.4%), stunting was more (24.6%) among males than females (15.3%). Acute malnutrition MUAC <12.5cm was 1.67% higher among females than males.

Table 3: Demographic characteristics and feeding pattern

Demographic	EBF n(%)	EIB n(%)	Initiation of ACF n(%)	
Characteristics	≥6months	30-60minutes	<6months	≥6months
Sex				
Male	18(52.9)	20(48.8)	18 (43.9)	1 (2.4)
Female	13(40.6)	22(50.0)	12(27.3)	4(9.1)
p-value	0.72	0.10	0.24	
Town				
Ido	47(85.45)	27(49.09)	25(45.5)	3(5.45)
Usi	8(66.67)	5(45.45)	3(27.3)	0(0)
Igbole	1(33.33)	2(66.7)	1(33.3)	0(0)
Ifaki	10(62.5)	8(50.0)	1(6.25)	2 (12.5)
p-value	0.00	0.79	0.30	0.30
Level of education				
No formal education	1(100)	1(100)	1(100)	0(0)
Primary	0(0)	2(50.0)	0(0)	2(50)
Secondary	29(76.3)	16(42.1)	11(28.9)	1(2.6)
Tertiary	36(87.8)	22(53.7)	18(43.9)	2(4.9)
P-value	0.00	0.33	0.00	0.00

EBF- Exclusive breastfeeding, EIB- Early initiation of breastfeeding, ACF- Appropriate complementary feeding

Table 4. Nutritional status and the type of school and town

	Underweight (%)	Overweight (%)	Wasting (%)	Stunting (%)	Microcephally (%)	Macrocephally (%)
Type of School						
Public	13(8.23)	4(2.53)	12(7.59)	28(17.72)	8(5.06)	23(14.56)
Private	7(4.0)	7(4.0)	12(6.86)	11(6.28)	0(0)	30(17.14)
P-value	0.25	0.25	0.00	0.00	0.03	0.03
Town						
Ido	20(7.22)	9(3.25)	21(7.58)	38(13.72)	4(1.44)	42(15.16)
Usi	2(4.0)	0(0)	1(2.0)	12(24)	1(2.0)	7(14.0)
Ora	4(14.3)	1(3.6)	3(10.71)	5(17.86)	3(10.71)	3(10.71)
Igbole	4(8.3)	1(2.1)	3(10.41)	9(18.75)	5(10.42)	6(12.5)
Ifaki	4(25.0)	0(0)	4(25.0)	3(18.75)	1(6.25)	1(6.25)
P-value	0.04	0.04	0.00	0.02	0.02	0.02

There was significant association between the nutritional status and the type of school and town ($p < 0.05$) Table 4

Type of School, Town and Malnutrition

Underweight was higher in public than private schools while overweight was higher in private than public schools. Stunting was significantly 17.7% higher in public than private schools 6.28%. This was in line with a study in which underweight, stunting $p = 0.001$ and wasting were higher in public than private schools. The prevalence of under-nutrition was higher among public school pupils than those attending private schools (19). In this study, Macrocephally was significantly higher in private 17.14% than public schools 14.56% while microcephally was significantly observed only in public schools 5.06%

Age and Malnutrition

Underweight, wasting and stunting were significantly highest among children 0-12months, the higher the age the lower the malnutrition status, probably because of difficulty in transition from EBF to ACF. There was significant association

between nutritional status and age group of the children. This is similar to a study which reported that the lower the age group of children under-five the more likely they were to be at risk of stunting (20), but contrary to a study (18) in which there was no significant association between malnutrition and age of study participants.

Socio Economic Status and Malnutrition

Belonging to low socioeconomic class was significantly associated with stunting, underweight and wasting in this study. Children of low socioeconomic class were more underweight while overweight and obesity were more prevalent among children from high socioeconomic class. A study showed that Children from the upper socioeconomic class were significantly more overweight and obese (18) while prevalence of stunting was higher in children of the lower socioeconomic class in another study (21). It is believed that socioeconomic class can affect the quality and

quantity of food available to children in the families (22).

Nutritional Status and Breastfeeding Practices

In this study, a lower proportion of children who had exclusive breastfeeding were stunted, wasted and significantly underweight compared to those who were not exclusively breastfed ($p = 0.001$) similar to some studies in which exclusive breastfeeding for 0-6 months significantly reduces the risk of under-nutrition among children under five (19, 23, 24) but contrary to a study in which the infants were in good nutritional status although were not exclusively breastfed (25).

A higher proportion of boys were exclusively breastfed than girls. This suggests why malnutrition was higher in girls than boys (Table 4). Exclusive breastfeeding practice was significantly highest in Ido and lowest in Igbole Ekiti, significantly highest among mothers with tertiary education and lowest among those with primary Education similar to a study which exposed a greater percentage of exclusive breastfeeding among women with secondary or high education attainment in relation to illiterate mothers and/or with a primary level of education, highest among those with increased income (26) contrary to the findings of a study (27). Another study revealed that poverty and unemployment were cited as some of the impediments against EBF by many respondents (28).

Early initiation of breastfeeding (EIB) for the first 30-60minutes of birth was higher among females 50.0% than males 48.8%, highest in Igbole, lowest in Usi Ekiti. In this study, EIB was highest among mothers with tertiary education and lowest among those with primary Education and higher among the rich than the poor. This is contrary to the findings of a study in Bangladesh (27).

A higher proportion of children under five who did not experience Early initiation of breastfeeding were underweight and stunted similar to a study which showed There was a relationship between early initiation of breastfeeding ($p=0.001$), and wasting in children under five (24).

CONCLUSION

Malnutrition especially stunting rate was high in

the study area. Factors such as age and sex, parental education and socioeconomic class had a significant impact on nutritional status of the under five. Overweight and obesity were more prevalent among the children from the upper socioeconomic class, attending private schools, while stunting, overweight and wasting were more in children of the lower class attending public schools. A high proportion of the children were exclusively breastfed. Malnutrition was low among children exclusively breastfed and those who were breastfed within the first 30-60minutes of birth. Early initiation of breastfeeding practice was low. Nutrition programs addressing under-nutrition among under-fives must continue to prevent its attendant problems in the society

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