
NUTRITIONAL STATUS OF UNDER-FIVE CHILDREN IN URBAN AND RURAL COMMUNITIES OF EDO STATE, NIGERIA

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ABSTRACT

CONTEXT

Adequate nutrition is essential for strong immunological, neurological and cognitive development of children.

OBJECTIVE

To assess nutritional status of under-five children in urban and rural communities in Edo State.

METHODOLOGY

A Community based descriptive cross-sectional study was conducted between August 2017 and February 2018, involving administration of pretested structured questionnaires to caregivers of 800 under-five children selected by multistage sampling technique. Data collected was analyzed using WHO Anthro® version (1.06) and IBM SPSS version 22.0 statistical software with statistical significance set at $p < 0.050$.

RESULTS

The mean age of under five children studied was 29.5 (16.4) for urban and 25.6 (16.4) months for rural respectively. Mothers were the primary caregivers in 378 (94.5%) urban and 386 (96.5%) rural communities studied respectively. Higher proportion of 199 (49.7%) urban than 170 (42.5%) rural under-five children were exclusively breast fed ($\chi^2 = 4.230$, $p = 0.040$). One-fifth of under-fives in the rural communities had abnormal BMI, while more than one-third were abnormal in the urban community. Hence a greater proportion of under five children in the urban community were stunted 105 (29.8%), wasted

104 (26.0%), underweight 67(16.8%), malnourished 44 (11.0%), 24 (6.0%) overweight, than their rural counterpart.

CONCLUSION

Exclusive breast feeding practice was low in both communities studied with nutritional status significantly better among rural than urban under-five children in Edo State. There is need to step sensitization campaigns on need to improve the nutritional status of children in our communities.

KEYWORDS

Edo State, Nigeria, Nutritional status, Under-five children, Urban and Rural

INTRODUCTION

The health status and well-being of under-five children are a key indicator of the socioeconomic wellbeing of any society.¹ Adequate nutrition including exclusive breastfeeding are important factors that exert positive influence on the health status of under five children.² Adequate nutrition is essential in early childhood to ensure healthy growth, proper organ formation and function, strong immune system with proper neurological and cognitive development.^{1,2} Adequate nutrition is very critical in promoting health and wellbeing of under five children, reduce disease morbidity and mortality and thus aid actualization of the Sustainable Development Goal 3.¹⁻³ Malnutrition which refers to a state of nutrition where the weight for age, height for age and weight for height indices are below -2 Z-score of the NCHS reference.⁴ Malnutrition constitutes a major public health problem in developing world and serves as the most important risk factor for the burden of disease especially among preschool children and has been linked to impair immunological, neurological and cognitive development of

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children in addition to reduced capacity of economic productivity in adulthood.^{3,5-7}

According to the World Health Organization, 45% of deaths among children under 5 years of age was linked to malnutrition, an estimated 5.6 million children under five years of age died in 2016, with Africa accounting for majority of these deaths attributed to malnutrition.⁴ The magnitude is so alarming that 9 children/minute die as a result of malnutrition, the World Health Organization has identified childhood malnutrition as the most lethal form of malnutrition.^{3,4} Globally, it is estimated that nearly 20 million children have severe acute malnutrition, most of which live in south Asia and in sub-Saharan Africa.⁸ Children with malnutrition especially acute malnutrition face a higher risk of morbidity and mortality from infectious disease, than their counterparts with sufficient nutrition.⁹⁻¹⁰ Research finding reveal that more than 400,000 child deaths can be prevented each year by adequate identification and proper management of acute malnutrition.^{11,12}

In May 2017, UNICEF, WHO and World Bank Group released the 2017 edition of the joint child malnutrition estimates for the 1990–2016 period, representing the most recent global and regional figures. This document places the global prevalence of stunting, wasting and overweight at 22.9%, 7.7% and 6.0% respectively with an estimated corresponding population of under-five affected put at 154.8, 51.7 and 40.6 million under five children respectively globally. In Africa 31.2%, 7.4% and 5.2% of total under-five children are stunted, wasted and overweight respectively with an estimated corresponding population affected put at 59.0, 14.0 and 9.8 million respectively.¹³

In Nigeria, 37 per cent of children (i.e 6 million children) are stunted (chronically malnourished or low height for age), more than half of them severely. In addition, 18 per cent of children suffer from wasting (acutely malnourished or low weight for height), half of them severely. Furthermore, 29 per cent of children are underweight (both acutely and

chronically malnourished and low weight for age), almost half of them severely.¹⁴⁻¹⁷

Malnutrition trend in Nigeria reveals that stunting prevalence remained relatively stable between 2007 and 2013, whereas wasting has increased significantly, from 10 per cent in 2011 to 18 per cent in 2013.¹⁴⁻¹⁷ Although, underweight rates were stable between 2007 and 2011 at around 25 per cent, the rate increased slightly to 29 per cent in 2013.¹⁴⁻¹⁷ Furthermore, it is estimated that 11 million under five children in Nigeria suffer from malnutrition with 2.5 million of them estimated to suffer from Severe Acute Malnutrition (SAM) every year.¹⁴⁻¹⁷ This extremely dangerous condition makes these children nine times more likely to die from common childhood illnesses such as diarrhoea, pneumonia and malaria. Every year, nearly 420,000 children under five die as a result of this deadly combination in Nigeria.¹⁴

In order, to tackle the growing malnutrition menace and its consequences among children especially the under-five, the United Nations (UN) General Assembly which Nigeria is a Member State, in April 2016 proclaimed 2016–2025 the United Nations Decade of Action on Nutrition. The Decade is an unprecedented opportunity for addressing all forms of malnutrition. The UN set concrete timeline for implementation of the commitments made at the Second International Conference on Nutrition (ICN2) to meet a set of global nutrition targets and diet-related NCD targets by 2025, as well as relevant targets in the *Agenda for Sustainable Development* by 2030—in particular, Sustainable Development Goal (SDG) 2 (end hunger, achieve food security and improved nutrition and promote sustainable agriculture) and SDG 3 (ensure healthy lives and promote wellbeing for all at all ages).¹⁸

This study was conducted to assess nutritional status among under-five children in Edo State with a view to improving the nutritional health status of under-five children in Edo State.

MATERIALS AND METHOD

STUDY AREA

The study was carried out in an urban and rural community in Edo state, Nigeria. Edo state has a total population of 3,218,332 according to the 2006 population census and an annual growth rate of 2.7%. The projected population of Edo state is 4,430,739 in 2018. Edo state is made up of 3 senatorial districts (Edo North, Edo Central and Edo South) and 18 LGAs¹⁹.

The survey was carried out in predominantly urban (Oredo) and Rural (Etsako West) LGAs. The urban community was located in ward 12 (New Benin) in Oredo Local Government Area, with a total population of 29,400 according to the 2006 census. It is bordered to the North by Ute, Iyaro to the South, Okhoro to West and Okedo to the East.¹⁹ Upper Lawani and Eweka Communities in Ward 12 has 1 public primary health centre and 3 private health facilities, educational and religious institutions, with a very good road network and large business presence as evidence by shopping complexes and a popular state market. Benin is the predominant ethnic group however, there is a large population of non-indigenes who speak English and Pidgin English majorly and their indigenous languages. Majority of the inhabitants are educated and gainfully employed in either private or public institutions or engaged self-employed in business trade and Christianity is the predominant religion practiced by residents.

The rural survey was carried out in Irekpai and Ugbenor communities both located in ward 12 (Uzairue South West) of Etsako West LGA of Edo state. Both communities are bordered to the North by Ikabigbo, to the East by Ayogwiri, to the South by Ekperi and to the West by Iyora communities. They both share a primary health centre, which is located at Irekpai. They both have one government primary school, one government secondary school each and one market each, which functions every four days. Etsako is the predominant ethnic group, farming is their major occupation and Christians make up a larger proportion of the population.

A comparative community based cross sectional study design was utilized for this study, between August 2017 till February 2018 involving caregivers and their under-fives in Upper lawani and Eweka communities in Oredo L.G.A and Irekpai and Ugbenor communities of Etsako West LGA of Edo State. Minimum Sample size of 800 was calculated using formula for comparing proportions²⁰ based on prevalence of stunting among under five children in Zaria (31.0%)²¹ and in Ogun State (33.8%)²². Pretested interviewer administered questionnaire was administered to respondents recruited by multistage sampling technique. This sampling technique involved several stages which entailed; stage 1 selection of an LGA respectively from Edo North and Edo South Senatorial zone of Edo State using simple random sampling technique; Stage 2 selection of a political ward from each selected LGA using simple random sampling technique by balloting; Stage 3 selection of two communities each by simple random sampling technique from the selected ward in each LGA selected and Stage 4 using cluster sampling technique all eligible respondents in the selected communities were recruited for study till the calculated sample size was achieved. The questionnaire was divided into sections on socio-demographic data, feeding practices and general Inspection and Anthropometric measurements. The anthropometric measurements of each under-five was assessed using weight, height and mid-upper arm circumference.

Weight measurement: The weights were measured in Kilogram (kg) using a bathroom scale (Hana model) with a capacity of 120kg. The scale was set at zero point before each measurement. The scale was placed on an even floor with the child standing in the center of the scale with hands by the sides. For children who could not stand, the mother was asked to carry the child and stand on the scale with the reading on the scale recorded. The mother was then asked to stand alone on the scale, and the reading on the scale recorded. Then her weight was subtracted from the combined weight of her and her child to get

the weight of the child.

Height Measurement: The height of each child was measured in centimeters (cm) using a stadiometer. The measurements were taken with the child barefooted, standing erect on the stadiometer and looking straight ahead. Children that were unable to stand erect without support were laid on flat platforms and their length measured from the vertex to the heel of the feet.

Mid Upper Arm Circumference Measurement: This was measured in centimeters using a measuring tape, from the mid-point between the acromion process of the scapula and the olecranon process of the ulna, for under-fives who were between the ages of 12-59 months. The occupation of

caregivers was according to modified ILO classification. Relevant data collected was imported into the WHO Anthro® Software version (1.06) to compute the weight-for-age, height-for-age and weight-for-height, MUAC for age and BMI for age. The nutritional status was analyzed accordingly: Currently, the WHO recommended the use Z-Score or SD system to grade under-nutrition. This method measures all the three indices and expresses the results in terms of Z scores or standard deviation units. Children who are less than 2 SD below the reference median (i.e. a Z-Score of less than -2) are considered to be undernourished i.e. to be stunted, wasted or to be underweight. Children with measurements below 3 SD (a Z-Score of less

TABLE 1: AGE OF UNDERFIVE CHILDREN IN URBAN AND RURAL COMMUNITIES

Age group (months)	COMMUNITIES	
	Urban n = 400 Frequency (%)	Rural n = 400 Frequency (%)
0 – 11	71 (17.7)	87 (21.7)
12 – 35	158 (39.5)	181 (45.3)
36 – 59	171 (42.8)	132 (33.0)
Mean (SD)	29.5 (16.4)	25.6 (16.4)
t = 0.001, p = 0.022		
Sex		
Male	196 (49.0)	215 (53.7)
Female	204 (51.0)	185 (46.3)
$\chi^2 = 1.806, p = 0.018$		
Ethnic group		
Benin	128 (32.0)	0 (0.0)
Igbo	92 (23.0)	0 (0.0)
Esan	85 (21.3)	3 (0.8)
Yoruba	24 (6.0)	1 (0.3)
Etsako	24 (6.0)	382 (95.5)
Urhobo	16 (4.0)	0 (0.0)
Ika	15 (3.8)	0 (0.0)
Isoko	11 (2.8)	0 (0.0)
Others*	5 (1.2)	14 (3.5)
*Hausa, Etuno, Kalabari, Igala, Jaba		
Religion		
Christianity	386 (96.5)	265 (66.2)
Islam	14 (3.5)	134 (33.5)
African Traditional Religion	0 (0.0)	1 (0.3)
$\chi^2 = 120.787, p < 0.001$		
Type of family		
Nuclear	341 (85.3)	304 (76.0)
Extended	59 (14.7)	96 (24.0)
$\chi^2 = 10.955, p = 0.001$		

TABLE 2: PRIMARY CAREGIVERS WITH MARITAL, EDUCATIONAL STATUS AND SKILLED LEVEL OF MOTHERS OF UNDER FIVES IN URBAN AND RURAL COMMUNITIES

	COMMUNITIES	
	Urban n = 400	Rural n = 400
Primary caregiver	Frequency (%)	Frequency (%)
Mother	378 (94.5)	386 (96.5)
Father	12 (3.0)	3 (0.8)
Others*	10 (2.5)	11 (2.7)
$\chi^2 = 5.912, p = 0.116$		
Marital Status		
Single	8 (2.0)	5 (1.3)
Married	384 (96.0)	388 (97.01)
Separated	3 (0.7)	1 (0.3)
Widowed	5 (1.3)	6 (1.5)
$\chi^2 = 1.804, p = 0.614$		
Educational Status		
No formal education	3 (0.7)	21 (5.3)
Primary	70 (17.7)	176 (44.0)
Secondary	232 (58.7)	179 (44.8)
Tertiary	90 (22.8)	8 (2.0)
$\chi^2 = 118.362, p < 0.001$		
Mothers' Occupational Skill Level		
Unemployed and Students	34 (8.5)	29 (7.4)
Skill level 1	205 (51.9)	291 (74.4)
Skill level 2	82 (20.7)	58 (14.8)
Skill level 3	9 (2.2)	3 (0.8)
Skill level 4	65 (16.4)	10 (2.6)
$\chi^2 = 67.519, p < 0.001$		

*Aunt, Grandmother, Older sibling

than-3) are considered to be severely undernourished. Stunting (Low height-for-Age) is an indicator of chronic under-nutrition due to prolonged food deprivation and/or illness; Wasting (Low weight for height) is an indicator of acute under-nutrition, the result of more recent food deprivation and/or illness; Underweight (Low weight-for-age) is used as a composite measure to reflect both acute and chronic under-nutrition

UPPER ARM CIRCUMFERENCE: This was measured using shakir strip and categorized as follows Under-nourished: Less than 12.5cm; Borderline: Between 12.5 and 13.5cm; Normal: Greater than 13.5cm. Data collected was subsequently analyzed and prose and tabular format with quantitative variables expressed as mean (with standard deviation). Bivariate analysis

was carried out to determine the association between socio-demographic variables and various outcomes using Chi square. A p-value of < 0.050 was considered statistically significant.

ETHICAL CONSIDERATION

Ethical Approval and permission to conduct study was sought and obtained from the Local Government Chairmen of Oredo LGA and Etsako West LGA respectively including the respective Community heads before commencement of study. Also individual verbal consent was obtained from caregivers of under-five children who were informed on the purpose of the study before being interviewed.

RESULTS

Table 1 shows that mean age (SD) of urban (n=400) and rural (n=400) under five children

TABLE 3: CAREGIVER'S AWARENESS AND SOURCE OF INFORMATION ON EXCLUSIVE BREASTFEEDING IN URBAN AND RURAL COMMUNITIES

VARIABLE	COMMUNITIES	
	Urban n = 400 Frequency (%)	Rural n = 400 Frequency (%)
Awareness of exclusive breastfeeding		
Aware	346 (86.5)	344 (86.0)
Unaware	54 (13.5)	56 (14.0)
$\chi^2 = 0.042, p = 0.837$		
Source of Information*	n = 346	n = 344
Health workers	315 (91.0)	303 (88.1)
Friends	89 (25.7)	56 (16.3)
Television	83 (23.9)	31 (9.0)
Radio	50 (14.5)	29 (8.4)
Family Members	46 (13.3)	64 (18.6)
Newspaper	43 (12.4)	17 (4.9)
Religious Centre	42 (12.1)	13 (3.8)
*Multiple Response		

TABLE 4: EXCLUSIVE BREAST FEEDING AND COMPLEMENTARY FEEDING PRACTICES AMONG CAREGIVERS OF UNDER FIVES IN URBAN AND RURAL COMMUNITIES

VARIABLE	COMMUNITY	
	Urban n = 400 Frequency (%)	Rural n = 400 Frequency (%)
Exclusively breastfed		
Yes	199 (49.7)	170 (42.5)
No	201 (50.3)	230 (57.5)
$\chi^2 = 4.230, p = 0.040$		
Introduction of Complementary Feeding		
<6 months	180 (45.0)	202 (50.5)
6 months	23 (5.7)	49 (12.2)
>6 months	197 (49.3)	149 (37.3)
$\chi^2 = 17.315, p < 0.001$		
Complementary Feed introduced		
Fortified Pap	238 (60.1)	100 (25.3)
Infant formula	227 (57.3)	51 (12.9)
Soya beans	111 (28.0)	61 (15.4)
Pap only	89 (22.5)	271 (68.4)
*Multiple Responses		
Reasons for introduction of complementary feeding before 6 months	n = 180	n = 202
Insufficient breast milk	70 (38.9)	88 (43.6)
Work	35 (19.4)	38 (18.8)
No reason	45 (25.0)	34 (16.8)
Other reason*	30 (16.7)	42 (20.8)
*Health issues, Child refusal, Mastitis		

TABLE 5: WEIGHT FOR AGE AMONG UNDER FIVES IN URBAN AND RURAL COMMUNITIES

Nutritional Indicator	COMMUNITY	
	Urban n = 400 Frequency (%)	Rural n = 400 Frequency (%)
Weight for Age		
Normal	333 (83.2)	373 (93.2)
Underweight	67 (16.8)	27 (6.8)
$\chi^2 = 19.288, p < 0.001$		
Weight for height		
Not wasted	296 (74.0)	341 (85.2)
Wasted	104 (26.0)	59 (14.8)
$\chi^2 = 15.602, p < 0.001$		
Height for age		
Not stunted	285 (71.2)	296 (74.0)
Stunted	105 (29.8)	104 (26.0)
$\chi^2 = 0.086, p = 0.769$		
BMI for age		
Overweight	24 (6.0)	0 (0.0)
Normal	269 (67.2)	337 (84.2)
Underweight	107 (26.8)	63 (15.8)
$\chi^2 = 43.019, p < 0.001$		
MUAC for age		
Normal	356 (89.0)	360 (90.0)
Malnourished	44 (11.0)	40 (10.0)
$\chi^2 = 0.213, p = 0.645$		

studied was 29.5 (16.4) and 25.6 (16.4) months respectively ($t=0.001, p=0.022$); 171(42.8%) of children from urban community were in preschool age group as against 132(33.0%) from rural community and this difference was statistically significant. Also, 201 (51.0%) of respondents were female in the urban community as against 185(46.3%) in the rural community and this difference was also statistically significant. Furthermore, Benin 128(32.0%) and Etsako 382 (95.5%) was the more common ethnic group among respondents studied. Three hundred and eighty six (96.5%) and 265 (66.2%) of caregivers in urban and rural communities studied Christianity as against 14(3.5%) and 134 (33.5%) who practiced Islam and the difference was statistically significant. Finally, in relation to family type a lesser proportion of respondents in urban 59 (14.7%) than rural 96(24.0%) practiced extended family system and this difference

was statistically significant ($p=0.001$)

Table 2 identified mothers as the main caregivers of under-five children in urban 378(94.5%) and rural 386 (96.5%) communities studied, also in relation to caregivers marital status majority of respondents in urban 384 (96.0%) and 388 (97.0%) were married while in relation to skilled level of mothers 205(51.9%) and 291 (74.4%) of respondents in urban and rural communities were in skilled level one.

Table 3 shows that majority of caregivers in urban 346 (86.5%) and 344 (86.0%) were aware of the term exclusive breast feeding with health care workers identified as the main source of information for urban 315(91.0%) and 308 (88.1%) while religious Centre was identified as least source of information for urban 42 (12.1%) and rural 13(3.8%) communities respectively

Table 4 identified that a significantly higher proportion of caregivers in the urban 199

(49.7%) than rural 170 (42.5%) practiced exclusive breast feeding. Also, a significantly higher proportion of caregivers in urban 180 (45.0%) than rural 202(50.5) initiated complementary feeding before 6months following child birth. Furthermore, fortified pap was the main complementary feed among urban 238(60.1%) caregivers compared to pap among rural 271 (68.4%) dwellers. Caregivers in both urban 70 (38.9%) and 88 (43.6%) identified insufficient breast milk to satisfy the nutritional health need of infants as main reason.

In relation to nutritional assessment of under-five children table 5 shows that a greater proportion of under five children in the urban community were stunted, wasted,

underweight, overweight, and malnourished than their rural counterparts. Finally, the nutritional assessment of respondents are depicted in the Anthro charts for urban and rural respondents' shown in Fig.1-4 given below

DISCUSSION

The study identified that mean age of under five children was significant older in the urban than rural community studied. This finding may be due a high child birth, poor family planning and birth control measures among rural respondents compared to their urban counterparts²³. The majority of care givers in both the urban and rural communities studied were Christians,

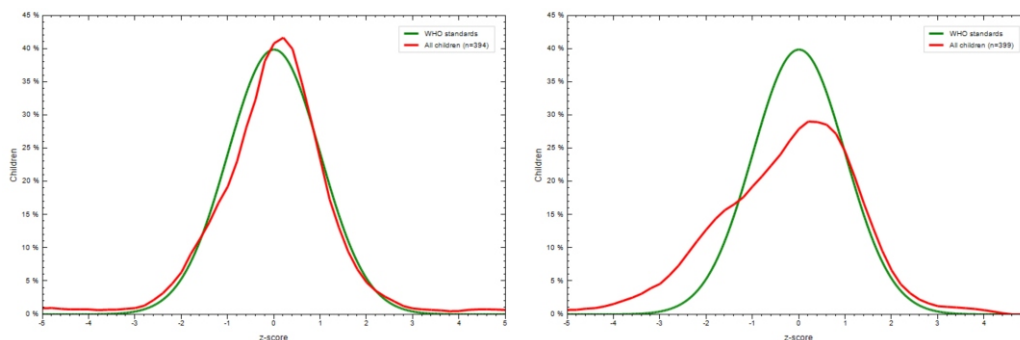


FIGURE 1: WEIGHT FOR AGE OF UNER FIVES IN URBAN AND RURAL COMMUNITIES

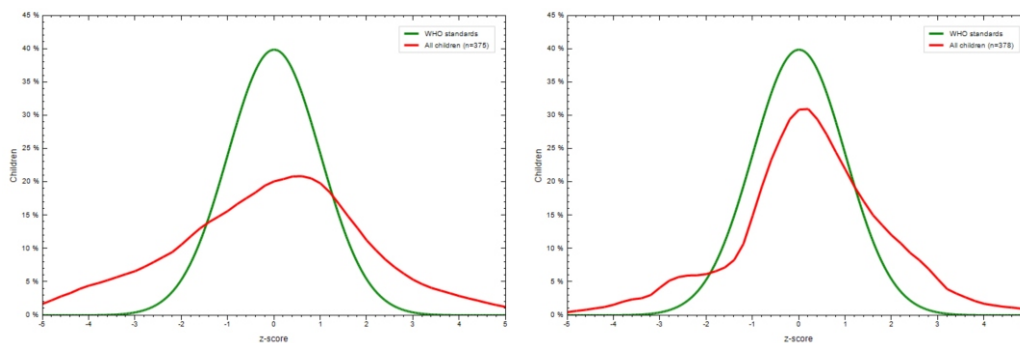


FIGURE 2: WEIGHT FOR HEIGHT OF UNDER FIVES IN URBAN AND RURAL COMMUNITIES

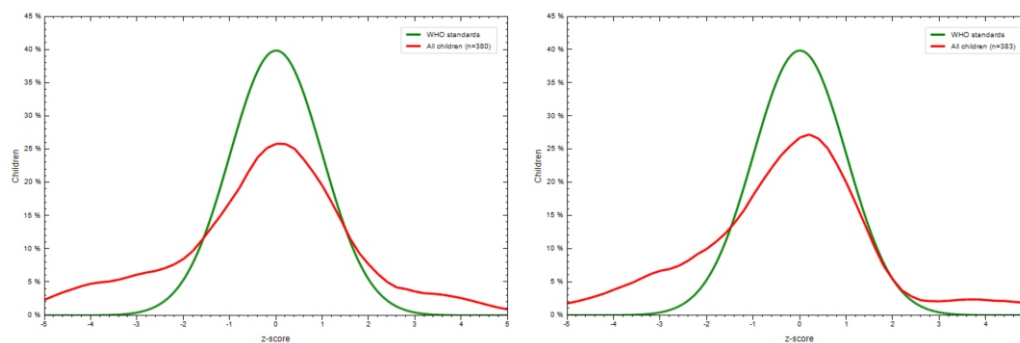


FIGURE 3: HEIGHT FOR AGE OF UNDER FIVES IN URBAN AND RURAL COMMUNITIES

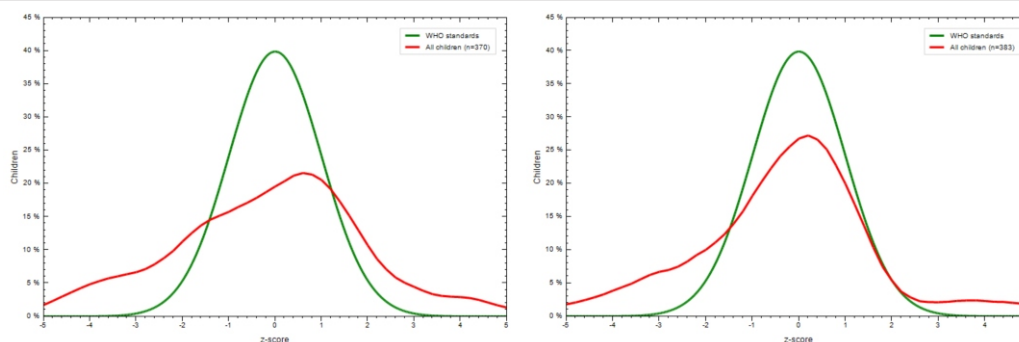


FIGURE 4: BMI FOR AGE OF UNDER FIVES IN URBAN AND RURAL COMMUNITIES

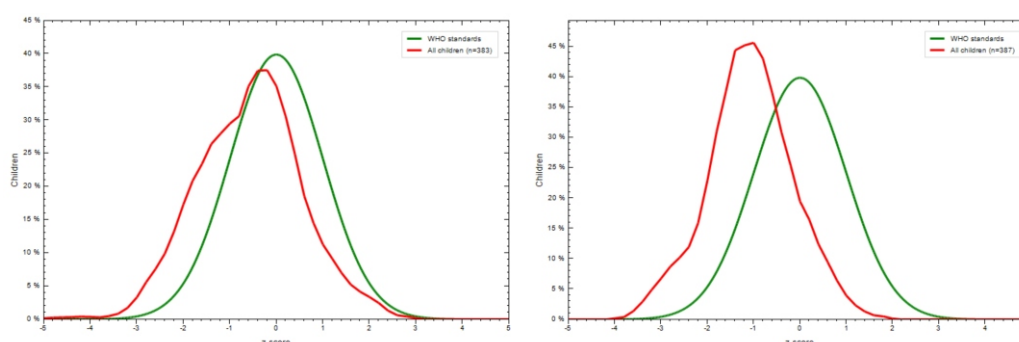


FIGURE 5: MUAC FOR AGE OF UNDER FIVES IN URBAN AND RURAL COMMUNITY

however there was a relatively higher proportion of caregivers practicing Islam in the rural community than in urban community. The findings in both communities studies are in contrast to a study done in Kaduna State, Nigeria in 2015 in which out of the 379 care givers, 64.7% practised Islam, while 35.3% practised Christianity²⁴.

The higher proportion of Christians in both communities is a reflection of Christian religious predominance in Edo State, Southern Nigeria and in line with Demographic and health survey findings for Edo State in 2013.¹⁸ However, the relatively higher proportion of Islam in the rural communities could be attributed to the study location which is situated in Edo North Senatorial zone where Islam is relatively higher compared to the Edo South Senatorial zones of the State.

Majority of caregivers in both communities were married which is typical of a developing economy with high fertility rate. The high proportion of married respondents seen in both communities is similar to findings in a study done in Kaduna State in 2015 in which

92.3% of the caregivers were married.²⁴ This could stem from the fact that the culture and predominant religions in both communities hold marriage in high esteem. Marriage is known to foster family stability and has a positive influence on the psychological and mental development of the child.

The practice of exclusive breastfeeding was noted to be higher in the urban community as compared to the rural community, although this was not statistically significant. This finding is in tandem to a comparative study done in 2011, in an urban and a rural setting in Imo State where exclusive breastfeeding was practiced more by mothers in the urban community than the rural community.²⁵ This finding could be attributed to a higher level of education of mothers in the urban community on the importance of exclusive breast feeding. This finding was also reported from a study in south western Nigeria.²⁶

The reduced practice of exclusive breastfeeding in the rural communities may lead to early introduction of other foods which may predispose the children to malnutrition, diarrhoea and infectious diseases such as measles and pneumonia.²⁷ In

the urban community, less than half of the mothers introduced complementary feeding before 6 months as against the rural communities where more than half of the mothers introduced complementary feeding before 6 months.

This is in contrast to a comparative study done in rural and urban communities of Lagos, Nigeria in 2012 among 300 children, in which more than half of the children in the urban community received formula feeds before the age of 6 months.²⁸

The relatively earlier introduction of complementary feeding seen in the rural community is similar to findings from an urban community in India in 2011 where more than half of the under-fives were introduced to complementary feeds before 6 months.²⁹ This may be attributed to the fact that in this study, mothers in the urban communities may have been well informed especially by health personnel about the vast benefits of exclusive breastfeeding as well as when to introduce other foods, necessitating the introduction of complementary feeding at 6 months or more.

The poor practice of exclusive breastfeeding which translates to early introduction of other feeds can predispose children to malnutrition and in extreme cases lead to a reduction in the child's immunity and general well-being. Consequently, a greater proportion of children introduced quite early to complementary feeding especially in the rural communities, may be at risk of diarrhoea diseases, which is one of the major killer diseases of under-fives²⁷. In the long term there could be increased risk of obesity and cardiovascular disease.

There is also a risk of poor child spacing and consequently a large family size due to the loss of natural family planning (lactation amenorrhea) put in place by exclusive breastfeeding of children especially among rural caregivers. All these can impoverish families who may not be able to buy complementary feeds or cater for such large family size in such communities thus

worsening the vicious cycle of ignorance, poverty and disease²⁵.

Majority of under-fives in the urban and rural communities had normal nutritional status based on weight for age, weight for height, height for age, mid upper arm circumference and body mass index. It was discovered that under five children in rural communities had lesser incidence of wasting, stunting, underweight and overweight, than their urban counterparts, which were all statistically significant except for the stunting which was not. Only about one-quarter of under-fives were stunted in the rural community as compared to one third of their urban counterparts.

This finding is in contrast to a study done in Lagos in 2013 in Epe (rural) and Agbowa (urban) which showed a higher incidence of stunting in the rural area (43.3%) than the urban area (12.6%)³⁰

The low values seen in rural community is similar to a cross-sectional descriptive study done in 2012 in the rural community of Babban-Dodo, Zaria, North west Nigeria in which out of 300 children aged between 0 and 59 months studied, 87(29%) were found to have underweight, 21(7%) were wasted and 93(31%) were stunted³¹.

The finding in the urban community studied could be attributed to decreased intake of proteinous meals, increased intake of refined food as well as snacks and junk food, which have little or no nutritional value. Conversely, in the rural areas, children have more access to natural foods such as fruits, vegetables, meat, fish and other foods that are not refined, thus retaining their high calorific and nutritive values. An important long term consequence of chronic malnutrition is that children with stunting are prone to accumulation of body fat, especially central fat (obesity). This could increase the burden of non-communicable diseases such as diabetes mellitus (type 2) and hypertension in adulthood³⁰.

More than three-quarters of under-five children in the rural communities had normal

BMI-for-age as well as a higher proportion of mid upper arm circumference, compared to the urban counterparts which had significantly lower values. The incidence of over-weight and under-weight children was significantly higher in the urban than in the rural community.

This finding is in contrast to a study done in 2013, in Lagos, Nigeria where the incidence of underweight was more common in the rural than in the urban area²⁸. This may be as a result of the easy accessibility of children in the rural areas to natural food such as fruits and vegetables which have a high nutritive value, compared to those in the urban area who eat more of refined and junk food, with little or no nutritive value.

Malnutrition (manifested as underweight and overweight) is a public health problem that could adversely affect the physical, mental and social development as well as their overall well-being even in adulthood.^{3,5-7,32}

CONCLUSION

A higher proportion of the children in both urban and rural communities were breastfed, however the practice of exclusive breastfeeding was more in the urban than in the rural communities.

One-fifth of under-fives in the rural communities had abnormal BMI, while more than one-third were abnormal in the urban community. Hence a greater proportion of under five children in the urban community were stunted, wasted, underweight and overweight, than their rural counterparts. There is need to increase sensitization health education campaign programs across various levels on the immense benefits of breastfeeding and the importance of immunization practices so as to enhance the overall well-being of under five children.

LIMITATION OF STUDY

The findings of this study were based on self-report, so it was not possible to validate some of the claims made by respondents in the course of questionnaire administration.

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COMPETING INTEREST

We wish to state that this study is free of any competing interest and was fully sponsored by the authors.

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