

Health, Feeding Pattern and Anthropometric Status of Preschool Children (2-5 Years) in Ikwuano Local Government Area of Abia State, Nigeria

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ABSTRACT

The study design was a cross sectional survey aimed at determining the health profile, feeding pattern and anthropometric status of preschool children (2-5 years) in Ikwuano Local Government Area of Abia State. A multistage sampling technique was used to select 228 preschool children for the survey of which males were 117 and females 111. A semi-structured questionnaire was used to obtain information on the socio-demographic and economic characteristics of parents, the physical health profile and household feeding pattern of the studied children. Data was analyzed using SPSS version 22. Pearson's correlation was used to establish the association between health status and anthropometric status. Significance was accepted at P-value < 0.05. Anthropometric measurements (weights and heights) were used to obtain the height-for-age, weight-for-age and weight-for-height which were calculated using WHO Anthro. The results reveals that 2.2% of the children were wasted, 16.7% stunted and 3.5% were underweight. The study showed that the children met their minimum meal frequency (MMF) of three or four meal times per day with one or two snacks as desired, and their minimum dietary diversity (MDD) of consumption of at least four food groups among seven food groups per day. Factors which were significantly associated (P<0.05) with health and anthropometric status of the preschool children studied showed that weight-for-height (WHZ) z-scores correlates positively with incidence of malaria (r=.198, p=0.003) and child's deworming frequency (r=.180, p=0.007), while diarrhoea correlates negatively with height-for-age (HAZ) z-scores (r=-.229, p=0.000). It is recommended that a community based Nutrition education is needed for all mothers so as to keep them informed on the importance of timely deworming of children and to teach them appropriate feeding practices for children to ensure adequate nutrition for the children and other members of the family.

Keywords: Health, Feeding Pattern, Abia State, Anthropometric Status, Preschool Children.

INTRODUCTION

The health and nutritional status of children is an index of national investment in the development of its future man power [1]. Nutrition is a basic human right for all human beings, including children, as set out in the "Convention on the rights of the child" and other human rights agreements. In order to develop fully and maintain physical and mental health and wellbeing, children need to be free from hunger and malnutrition [2].

Children are considered to be the most important natural resource and biggest human investment for development in every community. However, the quality of life of school children continues to be poor in developing countries and the conditions is worst in the rural areas of the developing countries [3]. Children who are malnourished often fail to thrive, are more likely to suffer from impaired physical and intellectual growth which make them less productive during adulthood [4].

Preschool children (defined as age 2-5 years) constitute the most vulnerable segment of the population and their nutritional status is considered to be a sensitive indicator of community health and nutrition [5]. A school play an important role in the physical, mental and emotional development of children and is the most active phase of childhood growth. Common outcome of malnutrition among children under five years also include poor school performance, school absenteeism, delayed intellectual achievement, reduced cognitive development morbidity and mortality [6].

Child health plays a vital role in the development of a country. The first six years of life constitutes the most crucial span in life. Far from simple health cannot be defined in measurable terms, its presence or absence is subjective. Many indicators are employed to understand health.

The main child health indicators are poverty, malnutrition, health care provision, maternal health, empowerment of women, birth weight, breast feeding, immunization, access to health care and anaemia and the child mortality indicators are perinatal mortality rate neonatal mortality rate, infant mortality rate and under 5 mortality rates [7].

The consumption pattern of a household is the combination

of qualities, quantities, acts and tendencies characterizing a community or a human group's use of resources for survival, comfort and enjoyment and the type of food and non-food items consumed, vary from region to region [8].

Although economic factors are important determinants of nutritional status, feeding practices are often stronger determinants of childhood nutritional status, independent of socioeconomic determinants. In recognition of the role of infant and young child feeding practices on the nutritional status of children under 2 years, a global strategy for optimal infant and young child feeding (IYCF) was set up by World Health Organization (WHO) and United Nations Children's Fund (UNICEF) in order to reduce malnutrition among the children, which recommends early initiation of breastfeeding within one hour of birth, exclusive breastfeeding for the first six months and continued breastfeeding with the timely introduction of appropriate, adequate, and safe complementary foods along with continuing breastfeeding up to two years and beyond [9]. Complementary feeding practice includes introducing solid, semi-solid, and soft foods, which when combined with breastfeeding is an important step in reducing the risk of Undernutrition and its consequences [10].

Objectives of the study

- i. Determine the socio-economic characteristics of parents of preschool children studied in Ikwuano L.G.A.
- ii. Assess the health status of the children
- iii. Assess the feeding pattern of the children
- iv. Assess the anthropometric status of the children
- v. Determine the relationship between health status and anthropometric status of the children.

MATERIALS AND METHODS

Study design

The study design was a cross sectional survey of the health, feeding pattern and nutritional status of preschool children (2-5 years) in Ikwuano Local Government Area of Abia State.

Study area

Ikwuano Local Government Area is one of the local government area in Abia State, Nigeria with it's headquarter at

Isiala Oboro. Ikwuano has an area of 281km² and a population of 137, 993. Ikwuano is located at approximately 50° 25' 60" north of the equator and about 70° 34' 0" east of the Greenwich meridian [11]. The Northern border of Ikwuano is 3 miles (4.8km) South of Umuahia urban centre, the capital of Abia State of Nigeria's South East. The Southern border is 15miles (24km) from Ikot-Ekpene, Akwa-Ibom State. Ikwuano is bordered by Olokoro and Ibeku communities in the North and North-West, and by Bende in the East. It is also bordered by Nkalu in the South-East; Oboro-Akara in the South and Ohielu-Nsulu in the South and South-West. Ikwuano local government is made up of four large clans which include; Oboro, Ibere, Oloko and Ariam [11]. The climate is typical of the humid tropics and fairly even and uniform temperature throughout the year. The crops commonly grown in the area include Cassava, Plantain, Maize, Yam, Rice, Sweet Potatoes, African Yam Bean, Ukazi and Achara. The majority of the people are predominantly skilled labourers, followed by traders who engage in different business activities alongside civil service and farming [12].

Population of study

The study population was comprised of preschool children aged 2-5 years from the four clans/zones that make up Ikwuano LGA namely; Oboro, Oloko, Ibere and Ariam.

Sample size determination

Determination of sample size was based on Araoye, 2003 formula [13]

$$N = Z^2 Pq / e^2$$

N = sample size

Z = selected critical value of desired confidence level 95%

P = estimated proportion of an attribute that was present in the population 17%

q = 1-p

e = the desired level of precision 5%.

Prevalence of malnutrition (stunting) in Abia State is 17% (0.17) and 95% confidence level (1.96) with ± 5% (0.05) precision.

The prevalence of malnutrition (stunting) in Abia State is 17% [14].

The calculation for this project will be calculated as:

$$Z = 1.96, P = 0.17, \text{ hence } q = 1 - 0.17 = 0.83, e = 0.05.$$

$$\text{Thus } N = (1.96)^2 (0.17) (0.83) / (0.05)^2 = 217$$

An estimated total sample size of 217 was gotten from the calculation, then, to account for drop outs 10% of 217 was added to total sample size giving 238 which was approximated to 240.

Sampling procedures

Multistage sampling technique was used in selecting the sample size for the study. Simple random sampling was used to select four (4) Wards out of the ten (10) Wards in Ikwuano Local Government. The four (4) Wards selected were, Oboro ward 2, Oloko ward 1, Ibere ward 2 and Ariam ward. Eight (8) villages (Amaoba, Umudike, Umugo, Awomukwu, Ngwugwo, Obuohia, Ekpiri Ala-ala, Ariam Elu-elu) were randomly selected from the Twenty two (22) villages in the four Wards under study; two (2) villages from each Ward.

A systematic random sampling technique was used to select Two hundred and forty (240) households from Nine hundred and sixty-eight (968) households in the four (4) Wards under study (Household were systematically selected by counting every fourth household). Children 2-5 years in the selected households were used for the study. Information were gotten for all the 2-5 years old children in a particular household and where a household does not have children of the age bracket, the household is left for the next household.

Informed consent and ethical approval

Oral consent was sought from the village heads, parents and caregiver of the preschool children from the randomly selected households in the local government. The nature, objectives, procedure and safety of the research were explained to the parents/guidance of the participants to gain their trust and have their full consent. Ethical approval for the study was obtained from Ikwuano local government health authority, Isiala Oboro.

Data collection

Data was collected by 4 trained research assistants via face-to-face interviews using a well-structured and validated questionnaire. The well-structured questionnaire instrument included sections on:

Socio-demographic characteristics

This section was focused on collecting information on the background characteristics of the study participant's (age, sex) and the socio-demographic characteristics of their households- the occupation and educational level of their parents, number of children and adults in each household and tenancy status and household ownership of assets using a well-structured questionnaire.

Anthropometric assessment

Anthropometric measurements were taken using the procedure described by Lee and Nieman [15,16].

a. Weight Measurements

Body weight was obtained using a newly purchased bathroom scale (Camry Mechanical Personal Scale Model: BR9012 (1 - 120 Kg capacity.), placed on a hard floor with the sliding weight placed at zero and the balance bar aligned to balance. Subjects were asked to remove heavy outer clothing, take off shoes and empty their pockets, such as trousers. They were asked to stand still in the centre of the scale as to distribute their weight equally on both feet, without touching anything during the process of measurements. The weight was recorded on the questionnaire in nearest 0.1 kilograms, as an average of two measurements taken. These scales were calibrated each morning and checked at regular intervals during the day [15,16].

b. Height Measurements

Height for children were measured by means of a stadiometer (locally constructed), with vertical scale of metres and a sliding headpiece, to the nearest 0.1 cm. The children were asked to remove their shoes, heavy clothes and were positioned to face straight towards the trained assistant and relax with their back to the height ruler. They were helped to put their legs and knees straight together with arms aside, and to stand still with feet and heels touching together. The measuring rod was lowered to press the hair flat and the height was taken in centimetres on the questionnaire. The average of two measurements was taken [15,16].

Health examination

Health examination and Information about immunization records and common illness of the child was recorded from

the child's vaccination card and the mother's verbal report. The information also accessed the mothers awareness of immunization, how fully immunized their children were and the occurrence of diarrhoea, malaria and cough in the last 3 months before the survey.

Feeding pattern

This section on dietary practices provides information on usual behaviours related to meal consumption pattern and frequency, meal skipping and snacking.

Data analysis

A total number of 240 children and their households were interviewed. Data for 12 children were removed because the children were more than five years (60 months), thus final analysis were based on 228 children. The health status of the children with no and yes option were scored with binary number 0 and 1 respectively. The prevalence of malnutrition was merged because the number of preschool children studied that were severely wasted, stunted and underweight was small. For the prevalence of malnutrition in the studied children <-3 SD Severely underweight and those underweight from ≥-3 to <-2 SD were merged as underweight, children <-3 SD severely stunted and those stunted from ≥-3 to <-2 SD were merged as stunted, while children from ≥-2 to $<+3$ SD were Normal for underweight and stunted respectively. <-3 SD were severely wasted and from ≥-3 to <-2 SD wasted were merged as wasted, from ≥-2 to $\leq+1$ SD were Normal.

Statistical analysis

Data was entered and analysed using IBM SPSS Statistics Version 22. Descriptive statistics was used to describe the Socio-demographic and household characteristics of the preschool children and their parents/caregivers. Frequencies and percentages were computed for categorical variables. Frequencies and proportions were used to describe the dietary practices of the preschool children with respect to usual meal frequency, meal skipping and snacking habits. Also, weight for height, height for age, and weight for age Z-scores was computed using the WHO Anthro software and frequencies as well as proportions was calculated to describe the anthropometric status of the preschool children. Pearson's correlation was used to establish the relationship between anthropometric status and health status. Significance was accepted at P-value < 0.05 .

RESULTS

Table 1 show the Personal characteristics of the preschool children studied. More than half (51.3%) of the respondents were males, while 48.7% were females. Most of the children (46.5%) were aged 2 years, 32.0% were 3 years, 16.7% were 4 years, while 4.8% were 5 years old. Majority (90.8%) of the respondents were from monogamous families, while 9.2%

were from polygamous families. More than half (68.9%) of the children lived with both parents, 25.4% lived with their mother's alone and 5.7% lived with their father's alone. With respect to family size, 39.5% of the respondents came from 2-4 person family size, more than half (52.6%) were from 5-7 person family size, while 7.9% were from above 7 person's family size.

Table 1. Personal characteristics of preschool children studied

Variables	Classification	Frequency	
		No	%
Gender	Male	117	51.3
	Female	111	48.7
	Total	228	100
Age	2 years	106	46.5
	3 years	73	32
	4 years	38	16.7
	5 years	11	4.8
	Total	228	100
Family type	Monogamous	207	90.8
	Polygamous	21	9.2
	Total	228	100
Child's care giver	Both parents	157	68.9
	Mother alone	58	25.4
	Father alone	13	5.7
	Total	228	100
Family size	2-4 persons	90	39.5
	5-7 persons	120	52.6
	Above 7 persons	18	7.9
	Total	228	100

Table 2 shows the Socio-demographic characteristics of the parents of preschool children studied. About 49.1% of the mothers were between the ages of 21-30 years, 30.7% were between the ages of 31-40 years. For the father's age, 14.9% were between the ages of 21-30 years, 46.9% were between the ages of 31-40 years and 33.8% were above 41 years. Majority (89.0%) of the mothers were married, 4.4% were divorced, while 4.8% were widowed. About 96.5% of the fathers were married, 2.2% were divorced and 1.3% widower. About 21.8%

of the mothers had primary education, more than half (58.7%) had secondary education and 19.6% had tertiary education. For the fathers 23.2% had primary education, 53.2% had secondary education. One third (36.0%) of the mothers were skilled labourers, 31.6% traders and 24.9% were civil servants. Majority (45.5%) of the fathers were skilled labourers, Up to 28.6% civil servants, 18.2% traders and 5.0% unskilled labourers.

Table 2. Parents Socio-demographic characteristics

Variable	Classification	Mothers		Fathers	
		No	%	No	%
Age	< 20 years	38	16.7	2	0.9
	21-30 years	112	49.1	34	14.9
	31-40 years	70	30.7	10	4.6
	41 years above	5	2.2	77	33.8
	Not alive	3	1.3	8	3.5
	Total		228	100	228
Marital status	Married	206	89.0	220	96.5
	Single	4	1.8	-	-
	Divorced	10	4.4	5	2.2
	Widowed	8	4.8	-	-
	Widower	-	-	3	1.3
	Total		228	100	228
Educational qualification	Primary	49	21.8	51	23.2
	Secondary	132	58.7	117	53.2
	Tertiary	44	19.6	52	23.6
	Total	225	100	220	100
Occupation	Civil servant	56	24.9	63	28.6
	Skilled labourer	81	36.0	100	45.5
	Trading	71	31.6	40	18.2
	Farming	17	7.6	6	2.7
	Unskilled labourer	-	-	11	5.0
	Total	225	100	220	100

Table 3 shows only 21.1% of the parents earned ₦6,000-₦10,000 weekly, 44.7% earned ₦11,000-₦15,000, up to 29.4% earned ₦16,000-₦20,000, while 2.6% earned above ₦20,000 in a week. As much as 28.9% of the parents spent ₦1000-₦5,000 on weekly food purchase, more than half (53.9%) spent ₦6,000-₦10,000 on weekly food purchase, while 1.8% spent above ₦15,000. The study revealed that the housing condition of the families were good, since majority (99.1%) lived in cement house, and of the cement type house; 39.5% lived in bungalow, 37.3% in two rooms, 16.2% in flat, and 7.0% in

one room, while 0.9% of parents lived in mud/thatch houses. Majority (71.1%) of the families' used bore-hole water, 22.8% used sachet water, while a few 6.1% used stream/river water as their source of drinking water respectively. From the study, most of the families (71.1%) used water closet toilet, 26.3% used pit latrine and 2.6% used bush system. More than half (58.3%) of the families used firewood as their cooking fuel, 11.8% used cooking gas, while 8.3% used both firewood and kerosene, and 2.2% of families used both kerosene and cooking gas.

Table 3. Parents Socio-demographic characteristics (N=228)

Variable	Classification	Frequency	
		No	%
Family income weekly	₦6,000-₦10,000	48	21.1
	₦11,000-₦15,000	102	44.7
Family income weekly Family food purchase weekly	₦16,000-₦20,000	67	29.4
	₦1,000-₦5,000	66	28.9
Family food purchase weekly	₦6,000-₦10,000	123	53.9
	₦11,000-₦15,000	35	15.4
Family house type	Above ₦15,000	4	1.8
	Mud/thatch	2	0.9
Family house type If cement (type)	Cement/zinc	226	99.1
	Bungalow	90	39.5
If cement (type)	Flat	37	16.2
	One room	16	7.0
Source of drinking water	Two rooms	85	37.3
	Borehole	162	71.1
Source of drinking water Family toilet type	Stream/river	14	6.1
	Sachet water	52	22.8
Family toilet type	Water closet	162	71.1
	Pit latrine	60	26.3
Family toilet type Source of cooking fuel	Bush system	6	2.6
	Firewood	133	58.3
Source of cooking fuel	Kerosene	32	14.0
	Cooking gas	27	11.8
	Firewood and Kerosene	19	8.3
	Firewood and Cooking gas	12	5.3
	Kerosene and cooking gas	5	2.2

Table 4 showed that all (100%) the mothers were aware of immunization. The source of their awareness were found to be mostly through the work of the community leaders (53.1%), while 20.6% of mothers were aware through the mass media and 15.4% were through health workers. All the children studied (100%) had their immunization card intact and started their immunization at birth. Majority (98.7%)

of the children were fully immunized, while only 1.3% was partially immunized. Mothers of the two hundred and twenty eight preschool children studied, reported different health cases that they have experienced within the last three months before the study. About 4.8% of the mothers reported history of diarrhoea in their children, 67.5% reported history of malaria and 34.6% reported cough.

Table 4. Health status of the preschool children studied (N=228)

Variables	Classification	Frequency	
		No	%
Mother's awareness of immunization	No	-	-
	Yes	228	100
Means of immunization awareness	Mass media	47	20.6
	Friends	25	11.0
	Health workers	35	15.4
Immunization card available	Community leaders	121	53.1
	No	-	-
	Yes	228	100
Child starts immunization	At birth	228	100
	Don't know	-	-
Immunization status of child	Fully immunized	225	98.7
	Partially immunized	3	1.3
	No	217	95.2
Incidence of diarrhoea in last 3 months before survey	Yes	11	4.8
	No	74	32.5
Incidence of malaria fever in last 3 months before survey	Yes	154	67.5
	No	149	65.4
Incidence of coughing in last 3 months before survey	Yes	79	34.6
	No	-	-
Deworming of child	Yes	228	100
	3 months	3	1.3
	6 months	43	18.9
Deworming frequency of child	9 months	40	17.5
	Yearly	77	33.8
	Others	65	28.5

Table 5 revealed that majority (82.5%) of the children ate more than 4 times a day, while 17.5% of the children ate 3 times a day. More than half (51.3%) of the decision of what was eaten in the family was determined by the fathers, 46.5% by mothers, while only 2.2% of the children decided on the food eaten in their families. Factors that determined foods eaten in households were; availability of food in the house (57.9%), seasonality (23.7%), cost of food (15.8%) and child's choice (2.6%). About 22.8% of foods eaten in the study area were purchased from the market, while majority (77.2%) were partly purchased from the market and produced from the farm. The study also reveals that 35.5% and 20.6% of the

preschool children studied were fed by their Mother and Grandma respectively. About 19.3% of the children's favourite food was noodles and rice and stew respectively and 18.4% tea and bread. In this study, 64.5% of the children did not skip any meal. Only 9.6% of the children skipped breakfast, while lunch and supper were skipped by 15.8% and 10.1% respectively. The reason for skipping meal was majorly due to food dislike (12.3%), not being hungry (7.9%) hungry and not having anyone to cook the food (6.6%). About one third of the children (31.6%) ate small quantity of food when sick. More than half of the children (71.1%) consumed snacks three times every day.

Table 5. Feeding pattern of preschool children (N=228)

Variables	Classification	Frequency	
		No	%
Number of times child eats in a day	2 times	-	-
	3 times	40	17.5
	More than 4 times	188	82.5
Decision of food eaten	Mother	117	46.5
	Father	106	51.3
	Child	5	2.2
Factors that determine food eaten	Cost of food	36	15.8
	Availability of food	132	57.9
	Child's choice	6	2.6
	Nutritional value	-	-
	Season	54	23.7
Food source	Purchased from market	52	22.8
	Produced from farm	-	-
	Partly produced and purchased	176	77.2
Person that feeds child	Mother	81	35.5
	Father	34	14.9
	Self	52	22.8
	House help	14	6.1
	Grand ma	47	20.6
Child's favourite food	Noodles	44	19.3
	Rice and stew	44	19.3
	Beans and plantain	36	15.8
	Soup and garri	34	14.9
	Tea and bread	42	18.4
	Others, specify	28	12.3
Meals usually skipped in a day	Breakfast	22	9.6
	Lunch	36	15.8
	Dinner	23	10.1
	None	147	64.5
Meal skipping reason	No one to cook food	15	6.6
	No food	5	2.2
	Dislike food	28	12.3
	Limited time to feed	15	6.6
	Not hungry	18	7.9
	Does not skip meals	147	64.5
Child's eating pattern when sick	Small quantity	72	31.6
	Skip meals	57	25.0
	Eat more of snacks	29	12.7
	Refuses to eat anything	70	30.7
Child's daily snack consumption frequency	Less than 3 times	41	18.0
	3times	25	11.0
	More than 3 times	162	71.1

Table 6 shows the nutritional status of under-five children studied based on weight-for-height (wasting), height for-age (stunting) and weight-for-age (underweight). About 2.2% of the children were wasted. Females (1.8%) were more wasted than males (0.9%). Children aged 2years (1.3%) were more wasted than the other age groups. About 16.7% of

the children were stunted. Males (11.4%) were more stunted than females (5.3%). Children aged 2years (6.1%) were more stunted than the other age groups. About 3.5% of the children were underweight. Females (3.6%) were more underweight than males (3.4%). Children aged 3years (2.2%) were more underweight than the other age groups.

Table 6. Prevalence of malnutrition in children by age and sex (N=228)

Variables	2years F (%)	3years F (%)	4years F (%)	5years F (%)	Total F (%)	Prevalence	
						Male	Female
						F (%)	F (%)
Wasted	3 (1.3)	1 (0.4)	1 (0.4)	0 (0.00)	5 (2.2)	1 (0.9)	4 (1.8)
Normal	103 (45.2)	72 (31.6)	37 (16.2)	11 (4.8)	223 (97.8)	116 (99.1)	107 (96.4)
Total	106 (46.5)	73 (32.0)	38 (16.7)	11 (4.8)	228 (100)	117 (100)	111 (100)
Stunted	14 (6.1)	13 (5.7)	9 (3.9)	2 (0.9)	38 (16.7)	26 (11.4)	12 (5.3)
Normal	92 (40.4)	60 (26.3)	29 (12.7)	9 (3.9)	190 (83.3)	91 (77.8)	99 (89.2)
Total	106 (46.5)	73 (32.0)	38 (16.7)	11 (4.8)	228 (100)	117(100)	111 (100)
Under Weight	2 (0.9)	5 (2.2)	1 (0.4)	0 (0.0)	8 (3.5)	4 (3.4)	4 (3.6)
Normal	104 (45.6)	68 (29.8)	37 (16.2)	11 (4.8)	220 (96.5)	113 (96.6)	107 (96.4)
Total	106 (46.5)	73 (32.0)	38 (16.7)	11(4.8)	228 (100)	117(100)	111 (100)

Table 7 shows the Pearson's correlation between anthropometric status and health status of the children studied. The study shows that weight-for-height correlates negatively with height-for-age ($r = -.193$; $P < 0.01$), this indicates that the higher the prevalence of weight-for-age (wasting), the lower the prevalence of height-for-age (stunting). The study revealed that Weight-for-height correlates positively with weight-for-age ($r = .204$; $P < 0.01$), this indicates that the higher the prevalence of weight-for-age (wasting), the higher the prevalence of weight-for-age (underweight). The result shows that children who had malaria in the last 3 months before the survey had a significantly higher weight-for-height z scores

than those that did not have malaria ($r = .198$; $P < 0.01$). The result shows that the deworming frequency of children had a significantly higher weight-for-height z scores than those that did not have their children dewormed ($r = .180$; $P < 0.01$). The study also shows that height-for-age z score correlates positively with weight-for-age ($r = .362$; $P < 0.01$), this indicates, that the higher the prevalence of height-for-age (stunting), the higher the prevalence of weight-for-age (underweight). The result reveals that Height-for-age z scores of the children who had diarrhoea in the last 3 months before the survey had a significantly higher height for age z scores than those who did not have diarrhoea survey ($r = .229$; $P < 0.01$).

Table 7. The Pearson’s correlation between anthropometric status and health status of the children (N =228)

		WHZ	HAZ	WAZ	Incidence of diarrhea in the last 3 months	Incidence of malaria in the last 3 months	Incidence of coughing in the last 3 months	Deworm of child frequency
WHZ	Pearson Correlation Sig. (2-tailed)	1						
HAZ	Pearson Correlation Sig. (2-tailed)	-.193**	1					
WAZ	Pearson Correlation Sig. (2-tailed)	.204**	.362**	1				
Incidence of diarrhea in the last 3 months	Pearson Correlation Sig. (2-tailed)	.039	-.229**	-.068	1			
Incidence of malaria in the last 3 months	Pearson Correlation Sig. (2-tailed)	.198**	-.059	.071	-.063	1		
Incidence of coughing in the last 3 months	Pearson Correlation Sig. (2-tailed)	.005	-.120	-.062	.094	-.027	1	
Deworm of child frequency	Pearson Correlation Sig. (2-tailed)	.180**	.004	.097	.007	.011	-.006	1
		.007	.958	.143	.917	.871	.926	

** . Correlation is significant at 0.01 level (2-tailed).

* Correlation is significant at 0.05 level (2-tailed).

WHZ= weight-for-height z- scores; HAZ= height-for-age z- scores; WAZ= weight-for age z scores

DISCUSSION

More than half of the respondents in this study were males. This is close to the findings of Jude et al. [17] conducted in South Eastern Nigeria, where 50.6% of the respondents were males. This finding is consistent with a similar study conducted in Zambia by Emmanuel et al. [18] where more than half (51.8%) of the children were males. The result shows that children aged 2years dominated during the study. Majority of the respondent were from monogamous families. This is so because most families in South Eastern Nigeria practice monogamy. More than half of the children lived with both parents. This study report is close to the report of NHDS [14], where 70.7% of children in Abia State lived with both parents. With respect to family size, more than half of the children came from 5-7 person’s family size. Comparing the results with NDHS [14], majority of the children had an average size family

structure, since the minimum size for rural households are five. Also, based on the classification of family according to Zerida [19], low household size was a household with one to three members, a household of moderate size consist of five to seven members and a large household size comprises seven or more members. The child’s well-being is affected by his/her environment (including the home) which is largely influenced by the family structure, composition and relationship to members in the household [20]. Parents of the preschool children studied were young and in their productive years since most of them fell between 21-40years age bracket. Majority of the parents were married. The high percentage of married parents is expected as the study was carried out in the Eastern part of Nigeria which is dominated mainly by Christians who advocate for stability in marriages [21]. More than half of the mothers had secondary education. Women’s education offers leverage for improving nutritional status of children

through the provision of more effective parental care in the home. Educated mothers are better, well informed to use health care facilities to ensure nutrition security, have better hygienic practices, practice child spacing, give birth to fewer children and have better opportunities to pursue work outside the home to generate additional household income and also have higher status in the family. Increases in female social status and education account for half of the reduction in child malnutrition rates during the past 25 years [22]. The occupation of the parents gives a clue to the family income. In the study group, most of the parents were employed, skilled labourers and traders which give a high level of both socio economic and better life implication to the children. Parents occupation are important especially fathers, as it improves the socioeconomic status of family. With regards to weekly food purchase, more than half of the families spent between 6,000- 10,000 weekly on food. Naturally the level of income has a huge impact on standard of living and food consumption pattern of families. The housing condition of the families was good, since majority lived in cemented. This is so as the area under study was dominated by civil servants, artisans and traders. Majority of the families' used bore-hole as their source of drinking water. This report is similar to study by Nigeria Demographic and Health Survey which reported that 61% of households in Nigeria have access to an improved drinking water source and the percentage of households with improved sources of drinking water is highest in the South East (81%) (NDHS, 2018) [8]. From the study, most of the families used water closet toilet. According to NDHS [14], 56% of Nigerian households use improved toilet facilities. More than half of the families used firewood as their cooking fuel. This is similar to NDHS report that firewood is the main cooking fuel used in Nigerian households [14]. All the children studied had their immunization card intact and started their immunization at birth, mostly due to their mother's educational levels. Majority of the children were fully immunized. This conforms to NDHS [14], which reported that vaccination coverage in Nigeria has improved over the past 10 years. All the studied children were dewormed, but the problem remains on how often the children were being dewormed. This report conforms to NNHS [23] report, that the national coverage for deworming was 40% among children age 12-59 months. Majority of the children ate more than 4 times in a day, which is satisfactory for their ages. This is expected because in rural communities, there are lots of farms and forests that provide different fruits and vegetables to the rural dwellers. The frequency of feeding

of the children conforms to the Indicators for assessing infant and young child feeding practices on minimum meal frequency where Non-breastfed children should be fed meals four or five times per day, with one to two snacks as desired. Decisions on what is eaten in the more than half of the families was determined by the fathers; this is typical in most African setting, where fathers are the traditional heads and breadwinners of households whose role is to provide for both immediate and extended family members [24]. What was eaten in most households was determined by the availability of food in the households, cost of food and by seasonality. This is so because households in rural areas consume what is seasonally available from their farmland. Most of the households obtained their food from their farms and market. The high dependence on partly produced and purchased foods in the study could be due to change in livelihoods as people are more gainfully employed and are in diverse businesses to increase and stabilize their incomes away from the agricultural farming. Rural livelihoods are not solely based on agriculture but on a diverse array of activities and enterprises [25]. The study also reveals that most of the preschool children were fed by their Mothers and Grandma. This result agrees with the expectation that mothers are responsible for feeding preschool children as child feeding requires patience and time. The children's favourite foods were noodles, rice and stew, tea and bread. The favourite meals consumed by the children were within expectation and similar to the reports of Akerele et al. [26] that children are known to favour tasty meals that will give them less stress to eat. In this study, many of the children did not skip any meal; this may be attributed to high literacy level of the mothers who know the importance and benefits of each meal to their children. This result is similar to the study of Olusanya [27]. In a rural community in Ogun State. The reason for skipping meal was majorly due to food dislike and not being hungry. This is similar to study of Scagiloni et al. [28] who reported that Food likes and dislikes play an important role in food choices, especially in children. The prevalence of wasting in this study was very low compared to previous studies of rural school children carried out within Nigeria. Other studies have reported 12. 9% in Enugu Urban [29], and 11.3% in South-Eastern Nigeria by Jude et al [17]. The prevalence of wasting was more among females than males. This result contradicts reports from studies by Okwori [30] and Maitanmi [31], where male children were more wasting than girls. The prevalence of stunting in this study was lower than that reported by Amadi

et al. [29] and Jude et al. [17]. The prevalence of stunting was more among males than females. This conforms to the study of Maitanmi [31]. The prevalence of underweight in this study was higher than that reported by Onifade et al. [32], but lower than the report of Amadi et al. [29]. The prevalence of underweight in this study is consistent with the study of Etim et al. [33] but in contrast with study of Amosu et al. [34] where underweight was higher among females than among males. The prevalence of wasting, stunting and underweight observed from this study is lower than the report of the NDHS [14]. The reason for this seemingly low prevalence of malnutrition in this study area could be attributed to the high level of economic activities in this area due to the presence of a higher institution of learning. Increased income for mothers and caregivers may have indirectly had a positive effect on the nutritional well-being of the children and their families [35,36].

CONCLUSION

The socioeconomic characteristics of preschool children's family were average as majority of the children had a conducive living condition with good family income and spending ability on food, cement/zinc house, and good source of drinking water and toilet facilities. All the mothers of the preschool children studied were aware of immunization through different source and had the immunization cards of their children, while the children all started their immunization at birth. There were few incidence of diarrhoea, fever and cough, 3 months before the survey and all the children studied had all been dewormed although the frequencies of their deworming status varies respectively. Majority of the children ate more than 4 times in a day and father's determined what their families ate depending mostly on the availability of food at home, in season and cost of food as majority of the household partially purchased and produced their own food. Findings from the study revealed that the prevalence of wasting, stunting and underweight were low. We found that the Under-5 children studied had low prevalence of malnutrition and more adequate nutrition with only a few of them being undernourished. However, despite the low prevalence of wasting and underweight in the studied children, there is need for nutrition education programs for the mothers, as stunting is more prevalent.

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