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Nutritional Status of Preschool Children in Semi-urban Area of Benue State, Nigeria

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ABSTRACT

This study was carried out to assess the nutritional status of preschool children under-5 years in Benue state Nigeria. in order to establish and provide baseline information on the health and nutritional status of the target group. The study was carried out using anthropometric measurements (weights and heights) which were used in determining height-for-age, weight-for-age and weight-for-height, these indices were compared with WHO standards. Dietary assessment was carried out using food frequency questionnaire and 24-hour dietary recall obtained from their mothers. A semi-structured pretested questionnaire was used in gathering information on the socio-demographic and economic characteristics of mothers. Data was analyzed using SPSS version 21.0. The study revealed that the younger children (3 years old) were more severely malnourished than any other age, although the nutritional status improved with increased age. There was no difference in gender. 19.1, 17.9 and 18.9% were stunted, underweight and wasted respectively. In terms of dietary diversity score, majority of the children (45.7%) had low diversity (<4 food groups), only 29.6% accessed high dietary diversity score (6-8 food groups). Cereals, roots and tuber were the most popular food group consumed by children (31.2%), eggs diversity was the least (2.6%) consumed. Majority (56.9%) of the mothers had just secondary school education, only 16.3% earned a monthly income above N25, 000. The findings show that the nutritional status of Under-5 children in the study location is poor. Malnutrition was evident among young children due to the poor socio-economic status of their mothers.

Keywords; *Nutritional status, Under-nutrition, Dietary diversity, Preschool aged children, Under five*

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INTRODUCTION

Nutrition problems are not usually given attention until a severe stage or obvious clinical symptoms appear. The nutrition of preschool aged children (3-5 years) needs so much attention, since they are in a formative stage of life where growth is rapid and the nutrient requirements are relatively high (Bose, et al, 2008). Proper growth and development of children are determined by the quality of food they eat. Balanced and adequate diets are required for proper cell functioning, development of good immunity system and normal brain functioning in children (Preschulek et al, 1999). A report by World Health Organization (WHO) identified poor quality complementary foods with low nutrient density and inappropriate feeding practices as one of the major causes of malnutrition in young children (WHO, 2000). Several nutrition

disorders develop based on the nutrients that are lacking or consumed in excess. The former is the commonest type of malnutrition in developing nations, it occurs when an individual has a diet that gives them insufficient balance of basic groups of food. According to UNICEF, malnutrition contributes to more than half of all under-five childhood deaths throughout the developing world. This malnutrition usually makes its greatest impact on preschoolers (Whitehead and Roland, 2002). The associated effects of poverty, inadequate household access to food, infectious disease, and inadequate breastfeeding and complementary feeding practices often lead to nutrient deficiencies, growth faltering, delayed development, illness and death, particularly during the first two years of life (WHO/UNICEF, 2009). For child survival and prevention of malnutrition, proper nutrition and adequate health care during the first few years of life is fundamental. In

January 2016, United Nations International Children's Emergency Fund (UNICEF) announced in a press release that 3 million children would die of under-nutrition in the northern part of Nigeria if immediate interventions were not carried out (UNICEF and FMOH, 2016). Research shows that poverty, ignorance and diseases etc are the heart of the problem of children malnutrition in Nigeria (Staton and Harding, 2004). On a monthly basis, individuals are to assess their nutritional status and then take adequate measures to maintain a healthy life. This study is a combination of dietary assessment, anthropometric and socioeconomic status; they were used in determining the nutritional status of under five children in Nigeria.

MATERIALS AND METHODS

This cross-sectional and descriptive study was carried out to assess the nutritional status of children between the ages of 36-59 months in semi-urban area of Benue state, Nigeria. The study was carried out in the first six months of 2016. One thousand two hundred and seven preschool children were randomly selected for the study. They were further separated into 589 males and 618 female school children under the age of five living in Gboko town. The area covers a land mass of 2264 square kilometers with a population of 361,325 people according to 2006 census making Gboko one of the most populous local government area in Benue State. On the geo-political map of Nigeria it can be located between Latitude 6°30' and 8°10' north of the Equator and Longitudes 8° and 10° east of the Greenwich Meridian. Consent from the subject mothers were obtained after detail explanation and anyone who refused to sign the consent form was excluded from the study. The ages of the children were obtained from their mothers since children between 36-59 months could neither remember their exact age, fill questionnaires nor recall dietary intake. Ethical clearance for the study was obtained from the Benue state ministry of health. Research assistants were recruited and trained to help in administering the questionnaires.

Data collection: Data collection was carried out with a pretested semi-structured questionnaire and anthropometric measurements.

Anthropometric measurements: The age of each child was recorded with the help of the mother/care giver. The ages of children of illiterate mothers were calculated by asking them to name traditional festivals that took place around the period they gave birth to their babies.

Weight measurement: The body weight of each child in light clothing and without shoes was taken using a Seca scale to the nearest 0.1kg.

Height measurement: Standing height were measured using a constructed vertical wooden rod affixed with graduate tape in cm. subjects stood bare footed and readings were taken to the nearest 0.1cm. The recorded height, and weight formed indices which were compared with reference standards (WHO/UNICEF). Nutritional status was assessed using weight-for-age, height-for-age and weight-for-height.

Food intake measurement: The measure of dietary diversity score of the children was based on simple counts of the number of food groups consumed by the child in the past 24 hours. Eight food groups recommended by FAO (FAO, 2008) for assessing individual dietary diversity was used.

Socio-economic status: The background characteristics of socio-economic status. Family size, level of education, mother's occupation, monthly income, marital status and ages. Data analysis: The data obtained from the questionnaires were analyzed using Statistical Package for Social Sciences (SPSS) version 21.0 for all descriptive statistics, frequencies, percentages mean and standard deviations were used. Chi square test was computed for selected variables. The level of significance was taken as $P < 0.05$. Results were also compared with WHO and UNICEF standards for weight and height.

RESULTS

Socio-economic status: In Table 1, the socioeconomic status of the mothers revealed that majority (61.9%) of the households had a family size of 4-6, only 9.5% were within 1-3, the mothers of these under-5 children were more of secondary school graduates (56.9%), only 17.2% had tertiary education, although 3.4% had no formal education. Majority (33.7%) of the mothers were civil servants, 24.4% were petty traders, 17.4% were engaged in subsistence farming, 14% were artisans (hair dressers, tailors) and 10.5% were unemployed. The findings showed that 18.3% of the mothers of these children earned a monthly income less than N5000, 22.1% earned between N5000-N10 000, only 16.3% earn above N25 000. A good number of the mothers (47.6%) were still married, most (52.2%) of the mothers were between the ages of 25-34 years of age, only 26.1% were between 15 and 24 years.

Dietary diversity score. In terms of dietary diversity score, majority (45.7%) of the children had low diversity (<4 food groups) and about 24.7% had medium diversity (4-5 food groups), only 29.6% accessed high dietary diversity score (6-8 food groups). The mean dietary diversity was 4.6 food groups, with a minimum of 3 and a maximum of 7 food groups. Cereals, roots and tuber diversity was the most popular food group consumed by children (31.2%), followed by vitamin A rich fruits and vegetables diversity then Legumes & nuts at 22.9 and 12.6% respectively. The eggs and other vegetable diversity was the least consumed, at 2.6 and 4.9% respectively.

Gender and age: Table 2 shows the distribution of the nutritional status of under five children pinpointing both gender and age. The findings showed that gender did not affect the nutritional status among the children, although age was a brawny factor, the younger children (3 years old) were more under-nourished. A mainstream (19.1%) of the 3 years old were stunted (<-2SD), 17.9% were severely underweight (<-2SD) and 18.9% were severely wasted (<-2SD).

Table 1:
Socioeconomic status of the mothers

Variables	Classification	Percentage %
Family size	1-3	9.5
	4-6	61.9
	6 and above	28.6
Level of Education	No formal education	3.4
	Primary education	10.3
	Junior secondary school	12.1
	Senior secondary school	56.9
Mothers occupation	Tertiary education	17.2
	Subsistence farming	17.4
	Petty trader	24.4
	Artisan	14.0
Monthly income	Civil servant	33.7
	Unemployed	10.5
	<N5000	18.3
	N5, 100-N10, 000	22.1
Marital Status	N10,100 – N15, 000	13.5
	N15, 100- N20, 000	15.4
	N20,100- N25, 000	14.4
	N25, 100 & Above	16.3
	Married	47.6
Age (Years)	Single	25.2
	Divorced	9.7
	Widow	17.5
	15-24	26.1
	25-34	52.2
	35 & Above	21.7

Using Chi-square analyses there was a significant association between the age of child and stunting ($P = 0.01$), underweight ($P = 0.01$) and wasting ($P = 0.03$). Conversely, the older children (5 years old) were more over-nourished, 44.4% had an above normal height-for- their ages ($>+1SD$), 33.6% were overweight ($>+1SD$), 18.3% had an above normal weight-for-their respective heights.

Table 3 shows that mean weights and heights of the children ranged from 14.73 ± 2.30 to $17.54 \pm 2.74Kg$ and

98.78 ± 7.00 to $110.81 \pm 7.38cm$, respectively. Only 5 year old male subjects had a normal mean weight, the rest were moderately underweight but female subjects 2-5 years had a normal weight for their ages.

DISCUSSION

Malnutrition among under 5 year children is still a serious public health problem in developing countries (Pelletier et al, 2003; Staton and Harding, 2004). A high prevalence sometimes reflect the low socioeconomic status of the inhabitants which affects the dietary intake. In this research, the socio-economic status of the household revealed that majority (33.7%) of the mothers were civil servants, although only 16.3% earn a monthly income above N25 000, a greater percentage (18.3%) earn less than N5000. Such a relatively low income will most likely affect the nutritional status of subjects in such homes considering the cost of living in Benue State. Similarly, a study carried out on assessment of nutritional status of pre-school children from low income families in Akure (Akorede and Abiola 2013) reported poor nutritional status of majority of the subjects. The income of the household seems to be a major factor in determining the nutritional status, this is contrary to other studies (Onyango et al.,1998; Ruel, 2002).

With respect to dietary diversity score, majority (45.7%) of the children had low diversity (<4 food groups). Cereals, roots and tuber diversity was the most popular food group consumed by children (31.2%), eggs and other vegetable diversity were the least consumed, this is poor as compared to the required diet for toddlers, where most of it are to be from animal sources (milk, egg, meat including fish and poultry). Additional studies are required to explain the cooking method and caloric adequacy of the foods consumed by children in the study area. The high consumption of food items from mainly cereals observed in this study only confirms that the diets of the children were predominantly based on starchy staples.

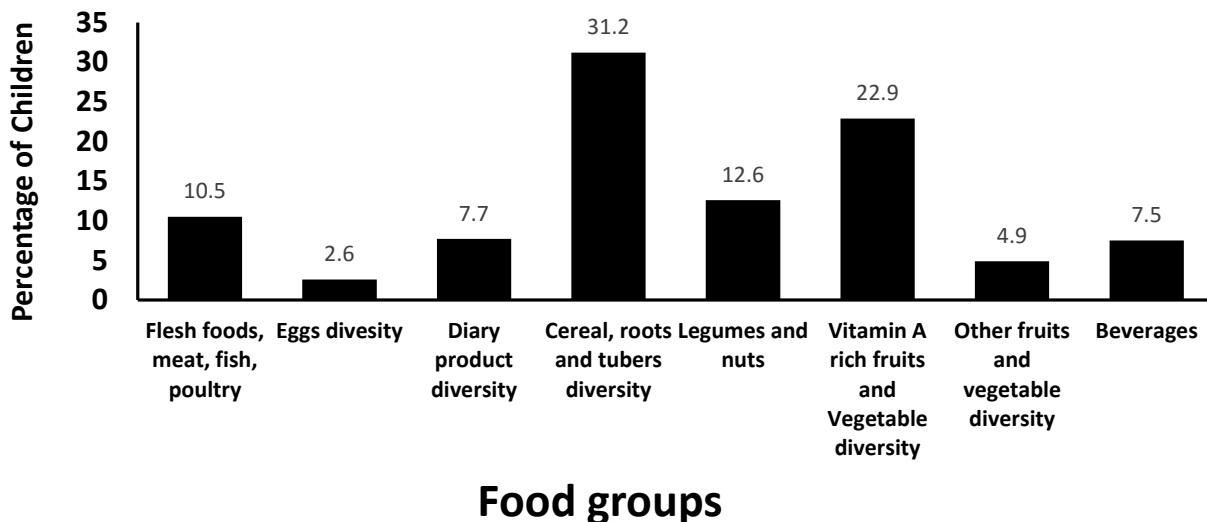


Figure 1
Distribution of children under five years by food groups consumed in Benue State.

Table 2

Nutritional status of children under five years

Age (Years)	Sex	Above normal >+1SD	Normal	Mildly malnourished -1SD	Severely malnourished <-2SD
Height-for-Age					
3 years	M (193)	35 (18.1%)	50 (25.9%)	63 (32.6%)	45 (23.3%)
	F (204)	60 (29.4%)	62 (30.4%)	51 (25.0%)	31 (15.2%)
	Total (397)	95 (23.9%)	112 (28.2%)	114 (28.7%)	76 (19.1%)
4 years	M (201)	53 (26.4%)	60 (29.9%)	56 (27.9%)	32 (15.9%)
	F (210)	54 (25.7%)	62 (29.5%)	58 (27.6%)	36 (17.1%)
	Total (411)	107 (26.0%)	122 (29.7%)	144 (27.7%)	68 (16.5%)
5 years	M (195)	83 (42.6%)	60 (30.8%)	41 (21.0%)	11 (5.6%)
	F (204)	94 (46.1%)	57 (27.9%)	29 (14.2%)	24 (11.8%)
	Total (399)	177 (44.4%)	117 (29.3%)	70 (17.5%)	35 (8.8%)
Weight-for-Age					
3 years	M (193)	30 (15.5%)	62 (32.1%)	60 (31.1%)	41 (21.2%)
	F (204)	60 (29.4%)	67 (32.8%)	47 (23.0%)	30 (14.7%)
	Total (397)	90 (22.7%)	129 (32.5%)	107 (27.0%)	71 (17.9%)
4 years	M (201)	22 (10.9%)	77 (38.3%)	77 (38.3%)	25 (12.4%)
	F (210)	57 (27.1%)	64 (30.5%)	53 (25.2%)	36 (17.1%)
	Total (411)	79 (19.2%)	141 (34.3%)	130 (31.6%)	61 (14.8%)
5 years	M (195)	50 (25.6%)	59 (30.3%)	56 (28.7%)	30 (15.4%)
	F (204)	84 (41.2%)	44 (21.6%)	41 (20.1%)	35 (17.2%)
	Total (399)	134 (33.6%)	103 (25.8%)	97 (24.3%)	65 (16.3%)
Weight-for-Height					
3 years	M (193)	35 (18.1%)	47 (24.4%)	68 (35.2%)	43 (22.3%)
	F (204)	26 (12.7%)	76 (37.3%)	70 (34.3%)	32 (15.7%)
	Total (397)	61 (15.4%)	123 (31.0%)	138 (34.8%)	75 (18.9%)
4 years	M (201)	41 (20.4%)	64 (31.8%)	73 (36.3%)	23 (11.4%)
	F (210)	24 (11.4%)	75 (35.7%)	89 (42.4%)	22 (10.5%)
	Total (411)	65 (15.8%)	139 (33.8%)	162 (39.4%)	45 (10.9%)
5 years	M (195)	38 (19.5%)	57 (29.2%)	60 (30.8%)	40 (20.5%)
	F (204)	35 (17.2%)	64 (31.4%)	72 (35.3%)	33 (16.2%)
	Total (399)	73 (18.3%)	121 (30.3%)	132 (33.1%)	73 (18.3%)

Table 3.

Mean weights, heights of the 3-5 year old children

Age (yrs)	No	Sex	Mean Weights (Kg) (+_S.D)	Mean Heights (cm) (+_S.D)
3	193	M	14.73 (±2.30)	98.78 (±7.00)
3	204	F	14.67 (±1.89)	98.50 (±5.65)
4	201	M	16.65 (±1.92)	104.87 (±5.79)
4	210	F	16.28 (±2.28)	105.56 (±8.83)
5	195	M	18.40 (±3.00)	111.77 (±9.25)
5	204	F	17.54 (±2.74)	110.81 (±7.38)

Other nutrient such as vitamins, proteins and minerals are also necessary for healthy living inspite of the high energy intake. (Gina et al., 2007).

The findings of this present study show a high prevalence of malnutrition among the preschool children. Age was a brawny factor, the younger children (3 years old) were more under-nourished, although there was no difference in gender, this is contrary to a research findings from Anambra (Chizoba and Okeke, 20015) which showed that male subjects were

favoured nutritionally than female ones due to cultural reasons like gender discrimination. This study revealed that 3 years old children were more severely malnourished than any other age, their nutritional status at the early age (3 years) was relatively poor although it improved as they increased in age. The chronic effect (Stunting and underweight) could be due to the nature/quality of the complementary food introduced. Verbally most mothers complained that their children were so selective in eating foods consumed by the rest of the family members. Also, the stress of staying in school till afternoon with a lunch box (mostly a low diversity score diet) might affect their eating habits which leads to a poor nutritional status. The prevalence of under-nutrition in this finding are lower than those of a study by Rao et al in India; 51.6% stunting, 61.6% underweight and 32.9% wasting. India has been reported to have had the highest prevalence of childhood malnutrition in the world (Bamji, 2003). On the whole, 19.1, 17.9 and 18.9% of 2-5 year old children in Benue were stunted, underweight and wasted respectively. Another research in Aguata showed a lower percentage of preschool children as 7.7, 2.4 and 7.7% stunted, underweight and wasted. The reason for such a reduced percentage of malnourished children in that study was simply because of collective efforts put towards reducing both

micronutrient and macronutrient deficiencies and BFHI programme in the region in the past few years. Other studies show that stunting increases with age among boys and girls (Akorede and Abiola, 2013; FMOH, 2013; Goon et al, 2011; Laura, 2009; Li et al, 2009; Mushtag et al, 2011; UNICEF, 2015;).

In conclusion, knowing the prevalence rates of stunting, underweight and wasting is important for determining the overall health of the community. This study found that malnutrition was prevalent among the under-5 children studied although a few were well nourished. The level of poverty and under education of the mothers could have resulted in the gross under-nutrition observed in the study, the family size could have contributed. Diversity and quality of the meals of particularly children below 3 years is poor, less than 30% of the children consume highly diversified; while close to 50% consume poorly diversified diets. Most of their foods were of plant source whose nutrients are not bioavailable. Some nutritionally good food combinations can be introduced in the area that can help in improving the quality of their nutrient intake. Future interventions should focus on improving dietary diversification and fortification which will reduce malnutrition for the rising population. Due to the poor socioeconomic status of mothers, women need to be empowered.

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