PREVALENCE OF MALNUTRITION AND ITS DETERMINANTS AMONG CHILDREN UNDER-FIVE YEARS IN LAGOS STATE, NIGERIA

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ABSTRACT

Malnutrition remains a major global public health challenge, especially among children under five years and the percentage of wasting in Lagos State was also found to be higher than the global target of less than 5%. This study therefore examined the prevalence of malnutrition and its determinants among children under-five years in Epe Local Government of Lagos State. The study involved 107 under-five children and their mothers. Anthropometric measurements were taken using standard procedure while a validated semi structured questionnaire was used to elicit information regarding the determinants of malnutrition. Indices were expressed as the standard deviation of units from the median for the reference group. Chi-square analysis was used to test significant differences in proportion, and $p < 0.05$ was taken .Results showed that the mean age of the children was 9.90±1.35. More than half (53.3%) were female. Prevalence of Wasting, stunting, underweight, overweight and obesity were found to be 16.8%, 6.5%, 11.2%, 1.9% and 2.8% respectively. Age of children, family income and toilet facility were the major determinants of malnutrition. Prevalence of malnutrition is higher among under-five male children, particularly between 5-11 months. There should be awareness of nutritional knowledge regarding the feeding practices and habit of the children especially children between 5-11months. Further studies should be tailored on other determinants factors of malnutrition among under-five children in different locations of the State.

INTRODUCTION

Growth monitoring during childhood is one of the most important health care means of children, and growth disorder is the first recognizable sign of medical, social, and especially nutritional problems (Mohseni, 2018). The World Health Organization (2020) estimates that there are 178 million children that are malnourished across the globe, and at any given moment, 20 million are suffering from the most severe form of malnutrition. Malnutrition among under-five children is one of the most important public health problem in developing countries especially Sub-Saharan Africa (Gulati, 2019) and about 35% of deaths of children that are under five years in the world was associated with malnutrition. Globally, in 2020 about 155 million under five years children were stunted, 52 million were wasted, 17 million were severely wasted and 41 million were overweight and/or obese (WHO, 2019 sited in Dukhi, 2020). In 2020, global wasting prevalence was 6.7%, severe wasting prevalence was 2.0% number affected by wasting was 45.4 million and number affected by severe wasting was 13.6 million. The highest number of under-five years children affected by wasting in 2020 live in Asia (31.9 million) and more than half of all children affected are from Southern Asia (25.0 million). Asia is home to more than three quarters of all children suffering from severe wasting. The number of countries with low and very low levels of overweight decreased from 64 countries in 2000 to 56 countries by 2020 (UNICEF/WHO/World Bank Joint Child Malnutrition Estimates, 2020). In Nigeria, malnutrition remains a serious health and welfare problem affecting the under five children to whom it contributes significantly to mortality and morbidity. The most recent National Demographic and Health Survey (2018) revealed that 37% of Nigerian children are stunted, 7% are wasted, while 22% are underweight. A good percentage of which are also experiencing multiple forms of malnutrition; both stunting and wasting simultaneously. According to the World Data Bank (2020), about half of Nigeria's population now live in extreme poverty surviving on less than 2 dollars a day. According to UNICEF, in recent times, as more families and households are losing their sources of income and home environments are turned upside down due to the socio-economic impacts of COVID-19, children find themselves more vulnerable to poverty and likely to be deprived of basic needs, in turn hitting their feeding practices

hard. In a presentation on the nutrition situation in Lagos state at a two-day meeting organized by Civil Society-Scaling Up Nutrition in Nigeria (CS-SUNN), it was reported that no fewer than 124 children have died of malnutrition in Lagos State between January and September 2023 with 15,329 cured of the diseases within the same period. With the outbreak of COVID-19 worsening nutrition situation across the world, coalitions of Civil Society Organizations in Nigeria have raised the alarm over malnutrition challenges in the country, particularly, in Lagos state where 6.6% of under five years were wasted and 17.3% were stunted, according to the 2018 National Demographic and Health Survey, NDHS. Good nutrition allows children to survive, grow, develop, learn, play, participate and contribute, while malnutrition robs children of their future and leaves young lives hanging in the balance (UNICEF/WHO/World Bank Joint Child Malnutrition Estimates, 2020). Meanwhile, malnourished children often suffer from impaired physical and intellectual growth due to what they consume and this makes them less productive during adulthood. Poor school performance, increased school absenteeism, reduced intellectual achievement, delayed cognitive development and increased disease morbidity and mortality are common effects of malnutrition among under-five children. In low and middle income countries (LMICs), it is estimated that about 10 million children die from treatable and preventable illnesses annually (Kalu & Etim, (2018). Child malnutrition may also lead to higher levels of chronic illnesses in adult life which may have intergenerational effects, as malnourished females are more likely to give birth to low-weight babies (Abel, et. al., 2019).. In South Western Nigeria, the situation seems not to be different, since the region is part of Nigeria, where her citizen suffers malnutrition, high mortality and fertility rate (Etim 2017). In 2023, Lagos State accounts for about 2,000 children with stunted growth due to malnutrition and the percentage of wasting (6.4%) was also found to be higher than the global target of less than 5% (Ezeogu, UNICEF Nutrition Specialist, 2023). With this crucial information, there is urgent need to determine the risk factors of malnutrition in Lagos State.

2. MATERIALS AND METHODS

Study Location and Design

This study was conducted in Epe Local Government Area (LGA) of Lagos State, Nigeria. Epe is located on the North side of the Lekki Lagoon and about 90 km from Ibadan, Coordinates: 6°35′N 3°59′E. During the 2006 Census, the population of Epe was approximately 181,409. Fishing is a major occupation of the area's inhabitants with the area's several rivers being rich in fishes, crayfish, periwinkles, and oysters.

Study Design

The study was descriptive cross sectional in design

Participants

Mothers and their under-five children attending the primary health care centers in the four major areas of Epe (Ketu/Agbowa, Epe, Eredo/odomola and Mojoda Ibonwon).

Sample Size Determination

Using Fischers formular of $n= Z^2 \times p \times q/d^2$
Where: Z=1.96 (constant) d= error 5% =0.05
p= prevalence of malnutrition in Lagos State=17.3% (NDHS, 2018)
q=1-p, ,n= 219.8. With 10% attrition rate of 219.8, the minimum sample size for this study was 220

Sampling Technique

There are Four (4) major areas having the twenty (20) wards in Epe Local Government Area of Lagos State. These are: Ketu/Agbowa, Epe, Eredo/Odomola and Mojoda/Ibonwon, respectively. Purposive technique was used in selecting the most visited Primary Health Care centers (PHC) in each of the 4 major areas , making a total of 4 PHC in all (Mojoda, Eredo, Epe and Ketu-Ejinrin). All the attendees (mothers and their children) on the visiting date, which happened to be the immunization days were involved in the study. A total of 124 mothers with their children participated in the study in the order: Mojoda-30, Eredo- 28, Epe- 37 and Ketu-Ejinrin-29. Data collection and measurements of anthropometric indices were achieved with the help of trained research assistance.

Inclusion Criteria

i. All under-five children,, male and female who were resident in the study location for minimum period of three years.
ii. Apparently healthy children who were not taking medication that can affect their health status
iii. Children whose parents gave consent to participate in the study
iv. Parents who were willing and ready to give information concerning themselves and their children.

Study Instruments

This is divided into section A, B and C.
Section A: This is an interviewer semi-structured questionnaire that contained information on the socio-demographic and socio-economic characteristics
Section B: This contained information on the anthropometric measurements of the U-5 children
Section C: This contained information on the factors that are responsible for malnutrition among U-5 children.

Measurements

Height: The heights of the children were measured to the nearest 0.1cm using a stadiometer with their feet flat on the floor and the heels, buttocks shoulders and back of the of the head touching the wall. As the children were looking straight ahead, the rigid head piece of the stadiometer were sliced down to the head crown and then their height were marked on the wall. The measurements were taken and repeated twice to obtain the average values.

Weight: Digital Bathroom weighing Scale was used for weight measurements. The children were weighed barefooted wearing only underwear or with minimum or light clothing, the readings were taken twice in order to obtained accurate weight measurement to the nearest 0.1kg.

The following indices were thereafter derived from the height and weight measurements.

1. Weight-for-height (wasting)
2. Weight-for age (underweight)
3. Height-for-age (stunting)
4. BMI/Age

Anthropometric measurement of weight and height were then assessed using WHO Anthro plus and EPI info electronic software.

Validation of Instruments

The questionnaire was given to nutritionists and analyst for comments and contributions, which were incorporated into final draft of the instrument to ensure both face and content validity. Anthropometric instruments were calibrated before use.

Reliability of Instrument

Reliability of the instruments was performed in Alimosho Local Government Area of Lagos among 20 mothers of U-5 children and their wards. Data were collected and analysed in order to determine the reliability of the instruments.

Procedure for Data Collection

The questionnaire was administered personally by the researcher and research assistants in the field. The research assistant helped to ensure adequate and timely retrieval of distributed questionnaire

Quality Control

Research assistants were recruited and trained on how to collect data from the respondents. Immediate and accurate recording of data were ensured by assigning each research assistant to one specific aspect of data collection. Pilot study was be carried out, to ensure validity and reliability of the research instrument and personnel.

Method of Analyses

Descriptive and inferential statistics was used for quantitative data. Statistical package for social sciences (S.P.S.S 21.0) was then used to generate frequencies, means and percentages from the data gathered for the measurements such as, anthropometric and food intake. The pattern of undernutrition was determined using WHO Anthro plus software. t-test

was used to check the differences in the mean body weight, height, whereas Continuity Correction test was used to test for the association of stunting with sex. Chi-square was used to test for the hypotheses formulated.

Consent form

A written consent form containing relevant information about the nature of the study was given to the mothers will be developed. Full disclosure of the procedures, benefits and most importantly confidentiality in the study was also explained.

Quality Control

The following quality control measures adopted to minimise errors:

1. Calibration of the instruments
1. Zeroing the bathroom weighing scale at each time of measurements
2. Ensuring that light clothing was worn by the children and their mothers during the process of taking body weight and height measurements
3. Repeating weight measurements of the children twice to ensure accuracy
4. Training of personnel in data collection to ensure standardization and uniformity

3. RESULTS

As presented in Table 1, a total of 107 children (boys: 50, girls: 57), aged 0-48months with mean age 9.90±1.35 were involved in the study. About 48.6% of the children were less than 6months, 23.4% between 6-11months, 9.3% were 12-23months and 18.7% were 24-48 months respectively. Majority of the children had 1st and 2nd position among their siblings (32.7% and 36.4%). Children's' measurement of weight (kg) and height/length (cm) were 7.47± 0.32 and 67.2±1.29 respectively. Almost half of the parents were self-employed (49.5%).. About 60.7% of the children use water closet toilet facility and borehole was their major source of drinking water (46.7%). About 42.1% of the U5 children were affordably fed Nutritional anthropometry of the children were presented in table 3 and the prevalence of stunting, wasting,, underweight, overweight and obesity were 6.5% (boys: 3.7%, 2.8%), 16.8%

(boys:9.3%, girls: 7.5%), 11.2% (boys: 7.5%, girls: 3.7%), 1.9%, 2.8%(boys; 0.9% girls: 1.9%) , respectively. There was no significant difference in height-for-age, weight-for-height and weight-for-age of the boys and girls. The following identified factors of malnutrition were presented in table 4: age of children, household size, marital status, fathers' income, mothers' education level, mothers' employment status, toilet facility and source of drinking water. There was a significant different in the age of the children, fathers' income, and toilet facility and height-for-age (stunting) of the children at $p<0.05$

Table 1: Children's (0-48months) Information

Characteristics	Frequency	Percentage (%)
Sex		
Male	50	46.7
Female	57	53.3
Total	**107**	**100.0**
Age		
< 6 Months	52	48.6
6 – 11 Months	25	23.4
12 – 23 Months	10	9.3
24 – 48 Months	20	18.7
Mean±S.D (months)	9.90±1.35	
Total	**107**	**100.0**
Position among Siblings		
1st	35	32.7
2nd	39	36.4
3rd	17	15.9
4th	6	5.6
5th	5	4.7
6th	5	4.7
Total	**107**	**100.0**

Table 4.2 Socio-economic Characteristics of the Respondents

Characteristics	Frequency	Percentage (%)

Employment Status		
Employed	35	32.7
Self-employed	53	49.5
Unemployed	12	11.2
Student	7	6.5
Total	**107**	**100.0**
Income		
≤ ₦30,000	30	28.0
> ₦30,000 – < ₦50,000	31	29.0
₦50,000 – ₦70,000	26	24.3
> ₦70,000	20	18.7
Total	**107**	**100.0**
Toilet Facility		
Water closet	65	60.7
Pit latrine	35	32.7
Bush	7	6.5
Total	**107**	**100.0**
Source of drinking water		
Spring/River	12	11.2
Well	14	13.1
Pipe-borne	26	24.3
Rain	5	4.7
Borehole	50	46.7
Total	**107**	**100.0**
Affordability of child's food		
Very affordable	45	42.1
Moderately affordable	35	32.7
Expensive	23	21.5
Extremely expensive	4	3.7
Total	**107**	**100.0**

Table 2: Children and mothers Anthropometric measurement

Parameter	Mean	S.D
Mother's height (m)	1.61	0.073
Child's length/height (cm)	67.2	1.295
Child's weight (kg)	7.47	0.327

Table 3: Anthropometric information of children of 0-48 months.

Index	Boys n (%)	Girls n (%)	Total n (%)	p-value
Height-for-Age				
Stunting (< -2 S.D)	4 (3.7)	3 (2.8)	7 (6.5)	0.427
Normal (≥ -2 S.D)	46 (43.0)	54 (50.5)	100 (93.5)	
Total			**107 (100.0)**	
Weight for Height				
Wasting (< -2 S.D)	10 (9.3)	8 (7.5)	18 (16.8)	
Normal (≥ -2 S.D – 2 S.D)	37 (34.6)	47 (43.9)	84 (78.5)	
Overweight (> 2 S.D – <3S.D)	2 (1.9)	0 (0.0)	2 (1.9)	0.347
Obese (> 3 S.D)	1 (0.9)	2 (1.9)	3 (2.8)	
Total			**107 (100.0)**	
Weight-for-Age				
Underweight (< -2 S.D)	8 (7.5)	4 (3.7)	12 (11.2)	
Normal weight (≥ -2 S.D)	42 (39.3)	53 (49.5)	95 (88.8)	0.123
Total			**107 (100.0)**	

Table 4: Associated Factors Variables and anthropometric Indices

Variable	Height-for-Age	Weight-for-Height	Weight-for-Age
Age			
Chi-square (x^2)	7.922	9.750	5.991
p-value	0.048*	0.371	0.112
Household Size			
Chi-square (x^2)	3.264	5.310	0.771
p-value	0.196	0.505	0.680
Marital Status			
Chi-square (x^2)	2.079	6.919	2.547
p-value	0.721	0.863	0.636
Income			
Chi-square (x^2)	8.303	7.495	0.409
p-value	0.040*	0.586	0.938

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* Significant at $p<0.05$ level

DISCUSSION

This study presents information on the prevalence of malnutrition and its determinants among U-5 children in Epe Local Government Area of Lagos State Nigeria. The result of this study revealed a higher prevalence of wasting and underweight than stunting among the children. The result of the study showed that boys were more malnourished than girls. The prevalence of stunting, wasting, underweight, overweight and obesity in the present study were: 7%, 16.8%, 11.2% , 1.9% and 2.8% respectively.

The prevalence of stunting and wasting in this study were lower than the report of study carried out among under-five years children of Ethiopia where the prevalence of stunting, underweight and wasting were 42.0%, 33.0% and 15.0% respectively (Abdullahi et al., 2017). Kiakie et al 2021 reported the prevalence of wasting, underweight, and stunting among under-five children in Sudan to be 2.3%, 4.8% and 23.8% which was lower than the result of underweight in this study and higher than the stunting rate in this study. Similar study carried out among preschool children in Nigeria observed malnutrition to be significantly higher among females than male children ($P < 0.05$), Children aged >24 months to be more stunted (22.4%), wasted (9.5%) and underweight (22.1%) than children <24 months. The study also reported the rate of stunting, wasting and underweight to be 28.4%, 12.3% and 28.1%, higher than the rate of stunting and underweight of this study but lower than wasting of this study (Donatus et al., 2017). Tinuola, Olakayode and Ogundoyin, (2019) reported the prevalence of stunting and underweight among under-five children in Nigeria to be 14.5% and 11.1%, values greater than the prevalence of stunting in this study but align with the underweight in this study. Jude et al., 2019 reported the prevalence of wasting, stunting, overweight and obesity among under-five children to be 2.4%, 3.5%, 1.5% and 1.5% respectively. This was against the rate of stunting and wasting of this study. The determinants of malnutrition identified in this study were: age of the U-5 children, household size, marital status, father's income, mothers' education, mothers' employment status, toilet facility, and source of drinking water, respectively. Gebre et al., 2020 also identified the age of children as the major factor of malnutrition in his study of the prevalence of malnutrition and associated factors among U-5 children in Pastoral communities of Afar regional state, North east Ethiopia.

CONCLUSION AND RECOMMENDATION

Findings from this study revealed the prevalence of stunting, underweight and wasting to be 6.50%, 11.20%, and 16.8% respectively. Hence, the most common form of malnutrition in this study is wasting and was found to be higher in boys (9.3%) as compared to girls (7.5%). The high prevalence of wasting in this study also confirmed the report of Ezeogu on

wasting, which was found to be higher than the global target of less than 5%. There was a significant association between the height-for-age and age of respondents (p=0.048), income (p=0.040) and type of toilet facility (p=0.042), meanwhile, there was no significant association between height-for-age and household size (p=0.196), marital status of parent (p=0.721), education level of parent (p=0.190), employment status of parent (p=0.878) and source of drinking water (p=0.224). No significant difference between the most common form of malnutrition and the identified determinants of malnutrition in this study.

Based on the findings of this study, it was recommended among others that Government should take into consideration children from families with low income and provide for them. There should be awareness of nutritional knowledge regarding the feeding practices and habits of the under-five children especially those between 5-11 months. Finally, further studies should be tailored on other determinants factors of malnutrition among under-5 children in different locations of the State to address the wasting prevalence.

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