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Case Study

Prevalence and Socio-Economic Factors Associated With Undernutrition among Children below Five Years of Age: A Case Study of Murtala Muhammed Specialist Hospital Kano State, Nigeria

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Abstract: Introduction: Malnutrition is still a serious Global Public Health Challenge, especially in South Asia and Sub-Sahara Africa. It is estimated to globally contribute to more than 33 percent of all child deaths (Bain *et al.,* 2013). About 165 million children less than five years of age were affected with under nutrition globally, which accounted for 16 percent prevalence (Ohnson, 2010; UNICEF, 2016). **Objectives:** This study was conducted to determine the Prevalence and factors associated with malnutrition among less than 5 years patients attending Paediatrics clinic at Murtala Muhammed Specialist Hospital (MMSH) Kano State, Nigeria. This is as the result of the scanty information on the prevalence of the under 5 malnutrition in Kano State and its locally generalized factors associated with. **Methodology:** The study design was descriptive and analytical cross-sectional with participation of three hundred and sixty (360) under 5 years Paediatrics patients at MMSH, selected by convenient consecutive sampling method. Quantitative and Qualitative methods of data collection were used. Data were then coded and entered in to SPSS software for further analysis. Both bivariate and logistic Regression analysis was performed to determine the strength of associations between the respondent and the outcome variables using p-values and 95% CI. **Results:** Base on the study, 184(51.1%) are Male and 176(48.9%) female, the prevalence of stunting (height- for- age Z score <-2), underweight (weight-for-age Z score <-2) and wasting (weight- for- height Z score <-2) are 48.6%, 41.9% and 22.8% respectively. Maternal Occupation (X^2= 36.623, P-value = 0.000), Paternal occupation (X^2= 35.396, P-value = 0.000), Income (X^2= 28.427, P-value = 0.000) and Decision on food items (X^2= 0.161, P-value = 0.923) are all Socio economic factors associated with under nutrition. After Regression Analysis for the Socio economic factors, ₦19,001 - ₦59,000 ($53-$164) Income of parents was (AOR=1.920, CI=1.347-4.962, P-Value=0.046) and was the only the major predictors of Stunting with a statistical significance. **Conclusion:** The research shows the prevalence of malnutrition to be increasing which confirm a report by the UNICEF 2013 and FMoH 2015 that incriminates the North Western region of the country to have the prevalence of 54% stunted children followed by the North East 53%. It also indicates parents whose income is ₦19,001-₦59,000, associated with the prevalence of under 5 malnutrition at MMSH Kano State Nigeria. **Recommendation:** Looking at the increasing malnutrition prevalence incriminated by this research, The Federal Government should try to approve and implement the ₦56,800 minimal wages as requested by the NLC (Nigerian Labor Congress) upon looking at the parent's income level incrimination by this report. Campaign on health promotion issues, such as hand washing, breastfeeding, appropriate complementary feeding etc.

Keywords: Malnutrition, Paediatrics patients, complementary feeding.

Chapter One

1.0 Introduction

This chapter presents the introduction, background, problem statement, general objective, specific objection, research objective, research question, subject scope, time scope and significant of the study.

Malnutrition is still a serious Global Public Health Challenge, especially in South Asia and Sub-Sahara Africa. It is estimated to globally contribute to more than 33 percent of all child deaths (Bain *et al.,* 2013). About 165 million children less than five years of age were affected with under nutrition globally, which accounted for 16 percent prevalence (Ohnson, 2010; UNICEF, 2016). However, its burden is still increasing among the developing and politically unstable Nations.

Stunting has prevalence of about 36 percent in Africa and 27 percent in Asia (UNICEF, 2016, UNICEF, 2013b). About 80 percent estimate of world's stunted children lived in just fourteen countries (India, Nigeria, China, Pakistan, Indonesia, Bangladesh, Ethiopia, Democratic Republic of Congo, Philippines, United Republic of Tanzania, Egypt, Kenya, Uganda, and Sudan). Sub-Saharan Africa and South Asia were the home to three-fourths of the world's stunted children, 40 percent and 39 percent, respectively (De Onis *et al.,* 2012).

Also there is an estimate of 101 million children below five years of age that are underweight globally which accounts for 16 percent prevalence with the highest of 33 percent in South Asia (59 million), followed by Sub-Saharan Africa (30 million), which was 21 percent (De Onis *et al.,* 2012; UNICEF, 2016).

Worldwide, the prevalence has declined, from 25 percent in 1990 to 16 percent in 2013, these reduced by 37 percent (Ohnson, 2010; UNICEF, 2016).

1.1 Background of the Study

Nigeria with a population of about 171 million, of whom 45 percent are below 15 years (about 77 million), also, about 30 million are under 5 years of age which make up 17.5 percent of the total population and also make up about 39 percent of the below 15 years population. Its growth rate is 3.2 percent. As a result, the country's population could double by 2035. The country consists of 36 states, a Federal Capital Territory and 774 Local government areas (LGAs), each with significant degrees of autonomy (UNICEF, 2013a; UNICEF, 2013b).

Nigeria has achieved high economic growth rates for the last eight years (6.5 percent annually), but equity in growth is not yet achieved. 54 percent estimate of the population lives below the poverty line (43 percent urban, 64 percent rural), and 90 percent of the poorest people live in the north (UNICEF, 2013).

In the Northern part of the country and in the lowest income quintiles, they have substantially less access to services. Of the urban population, 27 percent is food insecure, compared to 44 percent of the rural population. Socio-cultural barriers still impede many healthy household practices; the rate of exclusive breastfeeding is just 15 percent, and only 49 percent of babies are delivered by skilled attendants (UNICEF, 2013).

Not all countries have achieved the MDGs targets including Nigeria, yet all nations have been called upon to implement the SDGs, all within the same time frame of 15 years (Shittu,

2015). Nigeria failed to achieve some MDGs targets of 2015 but it has made improvements in the well-being of its children; the country was on track to achieve Millennium Development Goal 6. However, progress towards achieving the remaining Goals was limited (UNICEF, 2013; Shittu, 2015).

According to a report, MDGs arrangements are to be continued and improved. It is clear that, in numerical terms, the human resources that are needed for implementing the SDGs across Nigeria are adequate, there are significant deficits in the level of technical skills that are immediately available to deploy for new initiatives to meet the SDGs. In addition, the existing knowledge and experience of personnel who have learned from the implementation of initiatives for the MDGs is exceptionally valuable and must be preserved in order to ensure institutional and policy continuity and sustainability. Accordingly, human resources from the MDGs framework should be transferred to the SDGs programming period starting in January 2016 (Nigeria's Road to SDG, 2015).

With this low or slow progression, marks one of the background factor to the Health issues and problems in Nigeria. Under-five mortality fell from 201 deaths per 1,000 live births in 2003 to 124 per 1,000 in 2011, while infant mortality fell from 100 to 78 per 1,000. The maternal mortality ratio has improved, dropping from 800 per 100,000 live births in 2000 to 630 per 100,000 live births (Calverton, 2009; UNICEF, 2013).

The main causes of infant and child deaths are pneumonia, diarrhea, malaria and neonatal causes, compounded by under-nutrition and vaccine-preventable diseases (UNICEF, 2013). The poorest population quintile has an under-five mortality rate of 220 per 1,000 birth, compared to 90 per 1,000 among the richest quintile (Calverton, 2009).

In 2011, Child nutrition was improved by 36 percent, children less than 5 were 35 percent stunted compared to 41 percent in 2008, and 10 percent were wasted, compared to 14 percent in 2008 (UNICEF, 2013). However, national averages conceal high regional disparities. The highest levels of stunting are in the North-West (54 percent) and North-East (53 percent). Children in the poorest quintile are three times more likely to be stunted than those in the richest. Iodized salt use averages 80 percent nationwide; however, in the North, it is lower, at around 60 percent (UNICEF, 2013).

1.2 Statement of the Problem

Undernutrition among children below five years of age is a serious problem that causes delays in their physical growth, lower intellectual quotient, decreased economic productivity, poor school achievement and poor school performance, greater behavioral problems and deficient social skills, and susceptibility to various disease and cause of death (EuropeAid, 2009; Ubesie *et al.,* 2012; Hoddinott *et al.,* 2013; Sue Horton and Richard H. Steckel, 2013; Rossi, 2014; FMoH, 2015; John *et al.,* 2015). Undernutrition mostly effect under 5 years' children, specifically 6 to 36 months as well as the mother of reproductive age UNICEF, 2016). The Percentages of Children Stunted Under the Age of 5 by 2013 are 55% in North-West region, which comprises of Kano State as the study area of this research, being the most populous among the members state of the North West, 42% in North-East, North-Central with 29%, South-East with 16%, South-West 22% and South-South 18%, among the six geo-political region of the country (FMoH, 2015).

Despite various Support interventional programs developed by the Federal Government led by National Planning Commission in collaboration with United Nation development

Assistance framework (UNDAF-III) 2014-2017, which support the first 1,000 days of life on exclusive breastfeeding and counselling, with provision of supplies and technical assistance, (UNICEF, 2013), there is high cases of malnutrition in various Nutritional centers within Kano State especially Murta Muhammed Specialist Hospital remain High (FMoH, 2015).

Failure to refocus the existing interventions based on locally generated research data which provides area specific information on Maternal and Healthcare workers views as well as the associated factors , this may lead to increase in mortality and morbidity rates among the under 5. However, the prevalence of the Undernutrition in Kano State is still scanty due to the availabilities of data for so, and this research intends to establish the prevalence and the factors associated with the under 5 malnutrition in Kano State taken Murtala Muhammed Specialist Hospital as a Case study area.

This research can make available information on the associated factors of Undernutrition among under 5 which is necessary in addressing the declining rate of malnutrition, leading to the achievement of vision 20:2020 of the Nigerian Government interventional programs in line with the United Nations Sustainable Development Goals in Kano State using Murtala Mohammed Specialist Hospital as a starting point.

1.3 Objectives

1.3.1 General Objective

To determine the Prevalence and factors associated with Undernutrition among under 5 years patients at Murtala Muhammed Specialist Hospital (MMSH) Kano State, Nigeria.

1.3.2 Specific Objectives

a) To determine the Prevalence of Undernutrition among under 5 years patients at MMSH Kano State, Nigeria.
b) To determine the socio-economic factors associated with Undernutrition among under 5 years patients at MMSH Kano State, Nigeria.

1.4 Research Questions

a) What is the Prevalence of Undernutrition among under 5 year's patients at MMSH Kano State, Nigeria?
b) What are the socio-economic factors associated with Undernutrition among under 5 year's patients at MMSH Kano State, Nigeria?

1.5 Significance of the study

The study could be used by other researchers in academic settings who are willing to orient their works under similar theme. It can help in assisting the Public Health Department, FMoH, SMoH, PHCB, nutritionists and medical practitioners in educating the public based on the evidence from the research. The research could be very important to the affected community if the findings are disseminated to them. Also of significance importance to the improvement of MDGs and achievement of SDGs. finally, the Factors that are associated with that proportion of malnourished under 5 years of age children in the North-West states especially Kano will be demonstrated for further analysis investigation.

1.6 Scope

1.6.1 Subject Scope

This Study cover all under 5 year's children's with their care givers as their principle respondents attending the Paediatrics Clinic of MMSH Kano State, Nigeria.

1.6.2 Geographical scope

This study was carried out at Murtala Muhammad Specialist Hospital Kano State, Nigeria because; MMSH is located at the central town of Kano which comprise of 5 local governments areas out of the 44.

This hospital is the Major Specialist Referrals Hospital in the State. It is the largest and most advanced hospital in the city with better child health care facilities and with the highest attendance of medical care seekers.

1.6.3 Time scope

The Study was conducted within the period of three months July to September 2017 and the researcher determined the prevalence of malnutrition, socio-economic and demographic factors associated with Undernutrition among children below 5 years of age at MMSH Kano State Nigeria, and also the Paediatrics Health care workers view on the same.

1.7 Sample Collection

Quantitative data on prevalence, socio-economic, demographic factors and breastfeeding practice were collected from the Paediatrics clinic patients and Qualitative data using structured interviewer guide for the views of Paediatrics health workers which was developed by the researcher in English language and be translated in to the local Language (Hausa Language) to be validated by both the experts and the supervisor.

Chapter Two
Research Methodology
2.0 Introduction

This chapter presents the methodology which will be used in the study and it includes the study design and rationale, study setting and rationale, study population, inclusion and exclusion criteria, sample size determination, sampling procedure, inclusion criteria, study variables, research instrument, data collection procedures, data management, data analysis, ethical considerations, limitations of the study and dissemination of results.

2.1 Research Design

The Study was descriptive and analytical cross-sectional study. Descriptive because the Prevalence of the problem (Undernutrition), frequencies, percentages and means were all described with respect to the variables and also analytical because association between the factors and the prevalence of Undernutrition were analyzed.

Both Qualitative and Quantitative data collection method was employed for effective triangulation during discussion of research finding, in that qualitative method provides the much needed in-depth explanations while quantitative method provides the numerical data needed to achieve the required objectives.

2.2.1 Target population

The target population were children under 5 years of age.

2.2.2 Study population

The study population were those under 5 year's Paediatrics patients attending Murtala Muhammed Specialist Hospital Paediatrics clinic seeking for healthcare service at the period of the study who meet the research criteria and who's mothers are consented, agreeing to participate voluntary.

2.3.1 Sample Size Determination

The sample size of the study was determined by using Corcoran's 1977 formula that states that;

$$n = \frac{t^2 P(q)}{d^2}$$

$$\frac{(1.96)^2(.39)(.61)}{(0.05)^2}$$

Where:
t = value for selected alpha level of 0.025 in each tail = 1.96. (The alpha level of 0.05 indicates the level of risk the researcher is willing to take that true margin of error may exceed the acceptable margin of error).

(p)= 39% of a prevalence of Undernutrition, in a prospective cohort study conducted in Nnandi Azikiwe University Teaching, Anambra State, Nigeria. (2007)
(q) = (1-P)
n=desired calculated sample size,
d^2=Minimum allowed error 0.05%
n= 366 as calculated sample size

Therefore, the total 366 sample size of under 5 year's children's were collected during the study period.

2.3.2 Sampling Technique

A convenient consecutive sampling method was applied in this study. These techniques Involves the nonrandom selection of the under 5 children conveniently as they were presents, seeking for healthcare service during the study period and agree to participate after being consented. The respondents are selected from patients visiting the Paediatrics clinic at MMSH for a health care service which are below 59 months, and also consecutively selecting the participants as they come for the service.

2.3.3 Data sources

The independent variables data was obtained from the mothers and dependent variable data measured from the under 5 children during the time of data collections at Murta Muhammed Specialist Hospital Paediatrics clinic.

2.3.4 Inclusion Criteria

All under 5 year's pediatrics patients and the view of the Paediatrics Health care workers during the entire study period that have the wiliness to participate.

2.3.5 Exclusion Criteria

Under 5 Paediatrics patients as well as the Paediatrics Health Care workers that are not willing to participate during the study time and those mothers that have participated at one day of the study time so as not to duplicate.

2.4 Study Variables

The dependent variable is Undernutrition among under 5 year's Paediatrics patients. The independent variables are Socio Economic factors, demographic factors and Breastfeeding practice associated with the under 5 year's Undernutrition.

2.5 Data Management

2.5.1 Tool

Questionnaire: The study used semi-structured questionnaire with Close-ended questions, written in English language and the questions were to be translated in Hausa language by the researcher assistants, because some respondents in the study area may not understand English.

Interview Guide: An interview guide was used to capture the Paediatrics Health workers views which consist of 12 questions related to the variables of interest.

Research Assistants: Are healthcare workers with minimum of Bachelor degree in Health Care Sciences Career and adequate training and working experience which were all being given a copy of the proposal read through and discuss appropriately with the researcher. Two male and two female research assistants were employ and train for the purpose of this research; the training much concentrated on adherence of research ethics, such as confidentiality, purpose of the research, voluntary participation, and other ethical issues, method of data collection, data management at the field and other role they may play at data collection points.

2.5.2 Data collection methods

Data was collected and recorded through interview with the mothers of respective children by the research assistant(s) and also checking and recording for the measurements from the children all participating for Quantitative data and also from Paediatrics Health care workers for Qualitative data using Interview guide.

2.5.3 Free testing of tool

Free testing of the questionnaire was done by the research assistant at Hasiya Bayero Pediatrics Hospital Kano State.

2.5.4 Data Processing

Data was entered in EPI data 3.1 computer programs to minimize data entry error. The data entered was then exported to Statistical Package for Social Sciences (SPSS) version 22.0 for analysis. Then recoded, coded, categorized and sorted to facilitate its analysis.

2.5.5 Data Analysis

The prevalence of stunting, wasting as well as underweight was computed using the Emergency Nutrition Assessment software for WHO standards for 2006 (ENA for SMART 2011-2015).The data was used to compute and determine the Prevalence of Undernutrition cases among under 5 years patients and the proportion of each factor will be compared to under 5 malnutrition using Pearson's chi-square test of independence. Statistical Package for Social Sciences (SPSS) version 17 was used to analyses data. Descriptive statistics such as frequencies, percentages and means were used to obtain the variability and central tendencies of variables.

The weight and height measurements were converted into three summary indices of nutritional status: Weight-for height (wasting) and weight-for-age (underweight) and height-for- age (stunting) according to WHO criterion based on Standard Deviation (SD) units (termed as Z scores). Thus, wasting was defined as weight-for-height Z score less than -2, underweight as weight for age Z score less than -2 and stunting as height-for-age Z score less than -2. The analysis was performed using ENA for SMART (2011) software. Chi square test

was used to assess associations between potential determinants of malnutrition and indicator of chronic malnutrition. To identify associated factors, first a bivariate logistic regression was performed for each independent variable with the outcome of interest (Stunting).

2.6.0 Measurement of Variables

The dependent variable was Undernutrition and the independent were Economic factors and Socio demographic.

I. Malnutrition; these indices was measured and recorded.

- ✓ Mid Upper Arm Circumference (MUAC) for under years children
- ✓ Height for age for children of under 5 years of age
- ✓ Weight-for-age for children under 5 years of age
- ✓ Weight-for height for children under 5 years of age

Anthropometric measurements: Children of both sexes aged 0-59 months, were measured for height (cm) and weight (kg) to assess their nutritional status. Weight was measured on an electronic SECA weighing scale. Height was measured with a portable Harpenden stadiometer with a capacity of measuring up to 25 kg. Readings were made to the nearest 0.1cm. Adherence to the measuring techniques and recording procedures were observed to reduce measurement error.

Information on children feeding practices was gathered using structured questionnaires. Child age was obtained from the birth certificates, clinic cards or mother's recall. Where a household had two or more children in the target age group or twins, one child was selected randomly but the number of under5 child is recorded. The decision to enroll one child in a household is based on the fact that nutritional and health outcomes of siblings are likely to be related due to similarity in parental care, the sanitary conditions and availability and quality of food within the household.

II. Demographic; was obtained from the recorded demographic characteristics in the questionnaire distributed.

- ✓ **Sex:** male or female
- ✓ **Age of child;** 0 – 15 months, 16 - 30 months, 31 - 45 months and 46 - 59 months
- ✓ **Age of mother;** ≤19, 20-35, 36-50 and ≥51

III. Socio-economics; was obtained from the recorded socio-economic characteristics in the distributed questionnaire.

- ✓ **Maternal Occupation:** House wife, Self-employed, Civil servant, Pensioner
- ✓ **Paternal Occupation:,** Self-employed, Civil servant, Pensioner
- ✓ **Income:** (₦) ≤ 19,000/month, (₦) 19,001- 59,000/month, (₦) 59,001- 99,000/month, ≥ (₦) 99,001
- ✓ **Number of Household members;** 1-4, 5-8, 9-12, 12 and above

2.6.1 Validity and reliability of Research Instrument.

2.6.1.1 Validity of the instrument

The validation of the Questionnaire and the interview guide was done by both the supervisor and an expert in the field appropriately.

2.7 Ethical Considerations

An introductory letter was collected from the Cavendish University Uganda, which was presented to the Kano State Ministry of Health for their consideration and ethical approval. The ethical approval letter was then presented to the Management of Murta Muhammed Specialist Hospital before allowed access to the Paediatrics clinics and resources before commencement of the record extraction.

2.8 Limitations

This study was interpreted keeping in mind several limitations. Although the respondents were ethnically diverse, many mothers presented a malnourished child to the clinic and participated not in the study upon consented and most be excluded from the study. Time duration for the Ethical application and clearance from the Ministry of Health has to be adjusted. The result from this research may not be generalizable to more socioeconomically disadvantaged populations or to families who receive care in less integrated settings. Likewise, the qualitative data collected from the health care workers was only used as qualitative information for more discussions but cannot be used to generalize the same. Also, during data collections, questionnaires was translated from English to Hausa language for easy interpretations and understanding by the respondents.

2.9 Plan for dissemination of results

The results of this research was submitted to the School of post graduate Study, the Faculty of Science and Technology, the Supervisor, the Management of the Murtala Muhammed Specialist Hospital and the State Ministry of Health.

Chapter Three

Results and Findings

3.0 Introduction

This chapter presents a detailed analysis obtained from the data collected from the study with interpretation and illustration of the study findings. A total of 360 under 5 Paediatrics patients were interviewed. The chapter gives the presentation following the objectives of the study, i.e. Prevalence, socio-economic and demographic factors associated with less than 5 malnutrition.

3.1 Prevalence of Undernutrition

This contained the descriptive statistics which included frequencies and percentages that explained the distribution of respondents based on their demographic, Socio-economics characteristics and breastfeeding practice.

3.1.1 Prevalence of Undernutrition among under 5 children

Table 1. Proportion of Undernutrition, Stunting, Underweight and Wasting as measured

Variable	Frequency (n=360)	Percentage (%)
Prevalence of Undernutrition		
Yes	266	73.9
No	94	26.1
Prevalence of Underweight		
Yes	151	41.9
No	209	58.1
Prevalence of Stunting		

Yes	175	48.6
No	185	51.4
Prevalence of Wasting		
Yes	82	22.8
No	278	77.2

Table 1 gives out the burden of Undernutrition within the under 5 children samples collected and measured, Undernutrition prevalence was measured as at 73.9%, with 48.6% stunting prevalence, 41.9% underweight and 22.8% wasting prevalence.

3.2.0 Socio economic factors

Table 2. Distribution of Socio economic characteristics as measured

Variable	Frequency (n=360)	Percentage (%)
Socio-Economic Characteristics		
Maternal Occupation		
House wife	120	33.3
Self-employed	125	34.7
Civil servant	89	24.7
Pensioner	22	6.1
Paternal Occupation		
Self-employed,	130	36.1
Civil servant	142	39.4
Pensioner	86	23.9
Income		
(₦) ≤ 19,000/month	132	36.7
(₦) 19,001 - 59,000/month	136	37.8
(₦) 59,001- 99,000/month	81	22.5
≥ (₦) 99,001	9	12.5
Who make decision on food items to buy?		
Father	163	45.3
Mother	132	36.7
Both	59	16.4

Table 2 above shows the socio economic characteristics as distributed among the respondents, 120(33.3%) of the respondents are women of House wife, 125(34.7%) are Self-employed, 89(24.7%) are civil servants. 142(39.4%) and 130(36.1%) of civil servants and self-employed fathers were measured respectively. The family income of most 136(37.8%) respondents are ₦19,001– ₦59,000 and 132(36.7%) are less than ₦19,000. Most of the food in the family are decided by the father of which are 163(45.3%).

3.2.0 Socio economic factors

3.2.1 Socio economic factors associated with Undernutrition among under 5 children

Maternal Occupation (X^2= 36.623, P-value = 0.000), Paternal occupation (X^2= 35.396, P-value = 0.000), Income (X^2= 28.427, P-value = 0.000) and Decision on food items (X^2= 0.161, P-value = 0.923) are all Socio economic factors associated with Undernutrition.

Table 3. Socio economic factors associated with Undernutrition among under 5 children

	Prevalence of Stunting				
Variable	**Yes Freq. (%)**	**No Freq. (%)**	**Total Freq. (%)**	**Chi Square (x^2)**	**P-value**
Maternal Occupation					
House wife	36(30.0)	84(70.0)	120(33.7)	36.623	0.000*
Self employed	79(63.2)	46(36.8)	125(35.1)		
Civil Servant	52(58.4)	37(41.6)	89(25.0)		
Pensioner	5(22.7)	17(77.3)	22(6.2)		
Total	172(48.3)	184(51.7)	356(100)		
Paternal Occupation					
Self Employed	42(32.3)	88(67.7)	130(36.0)	35.396	0.000*
Civil Servant	96(67.6)	46(32.4)	142(40.0)		
Pensioner	37(43.0)	49(57.0)	86(24.0)		
Total	175(48.9)	183(51.1)	358(100)		
Income (month)					
(₦)≤19,000	61(46.2)	71(53.8)	132(36.9)	28.427	0.000*
(₦)19,001-59,00	71(64.0)	49(36.0)	136(38.0)		
(₦)59,001-99,000	25(30.9)	56(69.1)	81(22.6)		
≥ (₦) 99,001	1(11.1)	8(88.9)	9(2.5)		
Total	174(48.6)	184(51.4)	358(100)		
Decision on Food item					
Father	79(48.5)	84(51.5)	163(46.0)	0.161	0.923
Mother	63(47.7)	69(52.3)	132(37.3)		
Both	30(50.8)	29(49.2)	59(16.7)		
Total	172(48.6)	182(51.4)	354(100)		

Table 4. Regression Analysis for Socio economic factors associated with Under nutrition among fewer than 5 children

		95% CI		P-Value
Variable	**Adjusted odds ratio (AOR)**	**Lower limit**	**Upper limit**	**Level of significance**
Income:				
(₦)≤19,000	0.511	0.114	2.284	0.103
(₦)19,001-59,00	1.920	1.347	4.962	0.046*
(₦)59,001-99,000	0.130	0.005	3.117	0.208
Maternal Occupation:				
House wife	0.277	0.062	1.237	0.799
Self employed	1.208	0.282	5.180	0.093
Civil Servant	0.103	0.004	2.449	0.380
Paternal Occupation:				
Self Employed	2.030	0.761	5.415	0.157
Civil Servant	0.491	0.191	1.259	0.139
Decision on Food item:				
Father	1.927	0.695	5.339	0.207
Mother	1.364	0.480	3.872	0.560

From the Table 4 as shown above, the ₦19,001 - ₦59,000 Income of parents has an AOR of 1.920. This means, parents whose income is ₦19,001-₦59,000, are more likely of their child to be stunted than those parents whose income is less than ₦19,000 and greater than ₦59,001. This is statistically significant (AOR=1.920, CI=1.347-4.962, P-Value=0.046).

3.3.0 Demographic Factors

3.3.1 Distribution of Demographic characteristic as measured among fewer than 5.

Table 5. Distribution of Demographic characteristic as measured among fewer than 5

Variable	Frequency (n=360)	Percentage (%)
Demographic Characteristics		
Sex		
Male	184	51.1
Female	176	48.9
Age of child		
0-15	24	6.7
16- 30	89	24.7
31- 45	152	42.2
46- 59	95	26.4
Age of mother		
≤19	≤19	≤19
20-35	20-35	20-35
36-50	36-50	36-50
≥51	≥51	≥51

Table 5 above shows the distribution of the demographic characteristic With 184(51.1%) males and 176(48.9%) females of which 152(42.2%) are within age group 31-45months, 95(26.4%) within 46-59months and 16-30months 89(24.7%). Majority of mothers have age 20-35years 207(57.5%), followed by 135(37.5%) 36-50years.

Chapter Four

Discussion of Findings

4.0 Introduction

This chapter contained summary of the key findings according to the research objectives.

4.1 Prevalence of Undernutrition among under 5 years

From the research finding as analyzed by the researcher of sample size 360, 184(51.1%) are Male and 176(48.9%) female. According to the WHO classification of severity of malnutrition of 2006 standard, the prevalence of stunting (height- for- age Z score <-2), underweight (weight-for-age Z score <-2) and wasting (weight- for- height Z score <-2) are 48.6%, 41.9% and 22.8% respectively. As such, 73.9% of the respondents are Malnourished. This work coincides with A descriptive study by Andy eta al Niger state in Nigeria, The results indicates that 119 (47.6%) children were stunted, 64 (25.6%) underweight, while 22 (8.8%) were wasted. It also shows that the prevalence of protein energy malnutrition (PEM) in this population is 17.6%. Also, John et al in Tanzania reported the prevalence of stunting, wasting and underweight as 26.1%, 6.5% and 11.7%, respectively (John *et al.,* 2015). Another Study in south-western Nigeria consisting of three states are Ogun, Oyo and Kwara by Ekpo *et al.,* reported the overall prevalence of stunting was 38.7%, underweight of 38.7% and wasting of 13.6% (Ekpo *et al.,* 2008).

4.2 Socio economic factors associated with Undernutrition among under 5 children

From Table 7, Maternal Occupation (X^2= 36.623, P-value = 0.000), Paternal occupation (X^2= 35.396, P-value = 0.000) and Income (X^2= 28.427, P-value = 0.000) are all Socio economic factors associated with malnutrition which are found to be statistically significant. Also, From the Table 8, the ₦19,001-₦59,000 ($53-$164) Income of parents was (AOR=1.920, CI=1.347-4.962, P-Value=0.046), this is statistically significant, is determined as the predicator of Malnutrition among under 5 in Kano State.

The report correspond with a Survey of Salah *et al.,* which indicates the association between household and malnutrition, also indicate that the incidence of underweight among children decreased significantly (p< 0.01) as income increased (18.1 % among households with income less than P400 [equivalent to US$ 87] and 5.6 % among households with income range of P800-999 [equivalent to US$174-217]). Also a study of Senbanjo *et al.,* that report prevalence of wasting among children with more than 4 occupants per room ($\chi 2$ = 4.79, P = 0.029).

The prevalence rates of underweight and stunting were comparable in the two groups (($\chi 2$ = 0.76, p = 0.385 and $\chi 2$ = 0.029, P = 0.868 respectively), this house conditions depend on the parents income. Therefore, there is relationship between the income and Nutrition (Salah *et al.,* 2006).

The report incriminate children of Maternal and Paternal Self-employment are 1 and 2times more likely to be malnourished than others respectively, thus are all not statistically significant. This correspond to the work of Senarath et al., that stated low birth weight, poor complementary feeding practices and the period of exclusive breast feeding and many other predictors are having strong associations with stunting, with significant value for the period of exclusive breast feeding (OR= 2.29; P value 0.041) and the time of commencing complementary feeding (OR=1.51; P value 0.011) (Senarath *et al.,* 2015).

All this predictors are all associated with occupation of the individuals. Also, Salah *et al.,* stated that, underweight occurred to a lesser extent among children whose parents work in agriculture (7.5 % for parents involved in livestock and 28.6 % for parents working in crops) than among children whose parents were involved in informal business (40.0 %) (Salah *et al.,* 2006).

According to so many Paediatrics health worker views, most of which they said,

‘‘*…malnutrition is as a result of so many reasons, in which poverty is included, because is the main cause of everything, when there is poverty, they will not be able to afford all that is needed for the child…*’’ according to others, they said “*…the cause of malnutrition is the kind of food both parents, especially mothers takes during pregnancy an also the kind of food they administered to their children upon complementary feeding..”*

Conclusion and Recommendation

5.0 Introduction

This chapter presented the conclusions and key recommendations about the Prevalence, socio-economic and demographic factors associated with less than 5 malnutrition.

5.1 Conclusion

5.1.1 Prevalence of Undernutrition among Under 5 Years

This report attempted to assess the prevalence of Undernutrition, identify the factors that are associated with under 5yeras child malnutrition at Murtala Muhammed Specialist Hospital Kano State Nigeria. It shows the burden of malnutrition in Kano State. It show majority of the respondents to be stunted, followed by underweight and then wasting.

The research confirm the a report by the UNICEF 2013 and FMoH 2015 that incriminates the North Western region of the country to have the prevalence of 54% stunted children followed by the North East 53%. At same time, the prevalence of malnutrition appears to be increased.

5.1.2 Socio economic factors associated with Undernutrition among under 5 children

This report looks at socio-economic factors such as Maternal Occupation, Paternal Occupation and Parents Income, and it indicates parents whose income is ₦19,001-₦59,000, are more likely of their child to be stunted than those parents whose income is less than ₦19,000 and greater than ₦59,001.

5.2 Recommendations

These results suggest that policies and programs aimed at reducing levels of child Undernutrition should play particular attention to effective interventions that cut athwart sectors because of the diverse nature of the factors that impact child nutritional status.

- ✓ Looking at the increasing Undernutrition prevalence incriminated by this research, the Government should amend and adjust the interventional program, by increasing the health workers training and man power, putting more awareness campaign through media programs and produce an emergency nutritional centers within communities to have total control on the problem.
- ✓ The Federal Government should quickly approve and implement the ₦56,800 minimal wages as requested by the NLC (Nigerian Labor Congress) upon looking at the parent's income level incrimination by this report.
- ✓ Massive Mobilization programs campaign in favor of breastfeeding awareness should be implemented.
- ✓ Adopt an exclusive breastfeeding policy to inforce breastfeeding practice among the breastfeeding mothers.
- ✓ Make arrangement for food demonstration exercise using locally available resources for nutrition balance of the mothers and their children.
- ✓ Campaign on health promotion issues, such as hand washing, breastfeeding, appropriate complementary feeding etc.

Conflicts of interest

The authors declare no conflicts of interest.

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