Assessment of nutritional status and feeding pattern of under- five children in Edo Central Senatorial District

Malachy B Peter[1,2], Osahon Otaigbe[3], Ezekiel U Nwose[4], Chiedozie G. Ike[3]

[1]School of Public Health, Central University of Nicaragua Managua, Central America.
[2]Department of Dietetics, Irrua Specialist Teaching Hospital PMB 08, Irrua Edo State, Nigeria.
[3]Department of Community Medicine, Irrua Specialist Teaching Hospital PMB 08, Irrua Edo State, Nigeria.
[4]School of Health and Medical Sciences, University of Southern Queensland, Toowoomba Australia

Corresponding author: malachypeter18@gmail.com

ABSTRACT

Background: Malnutrition is a significant public health problem and it is an important cause of morbidity and mortality in children below 5 years of age.

Objective: To examine the relationship between nutritional status and feeding pattern of under-five children in Esan-land, Edo State Nigeria.

Methods: This was a cross-sectional descriptive study. Single-stage random sampling technique was used to recruit 300 mother-child dyads from the Edo Central Senatorial LGAs. A semi-structured questionnaire was used to obtain data on socio-demographic characteristics of mothers and feeding pattern plus nutritional status of child pair. Anthropometric included mid upper arm circumference to assess malnutrition (MUAC <125mm). IBM SPSS 22 Version was used to analyze the data.

Results: Among the 300 mothers, mean age of mothers was 29.5 years. 23% are unaware of the relationship between nutritional status and feeding pattern, but 57% have knowledge of significant nutrients. Out of the 300 children, 54% are females, daily feeding pattern was 0.7% fed once, 7.7% fed twice, 30% fed thrice and 61.7% >3 /day. Further, 65% were well nourished (MUAC <135mm), and 64.8% of the 105 malnourished children were stunted, while 35.2% represented acute malnutrition. There was a significant statistical association between the mother's awareness of nutritional status versus practiced feeding pattern (P = 0.001).

Conclusion: There is need to promote infant and young child feeding. Although exclusive breastfeeding may match with level of knowledge among mothers, those who indicate lack of knowledge are still high and over one-third of under-5 children were found malnourished.

Keyword: Feeding Pattern, Malnutrition, Nutritional Status, Stunting, Under 5 children,

INTRODUCTION

Globally, 6.3 million children under five years of age die every year. Nearly half of these deaths are attributable to under nutrition (1). The consequences of under nutrition among children are delay in physical growth, lower intellectual quotient, greater behavioral problems, and deficiency in social skills and susceptibility to contracting diseases (2).

The nutritional status of under-five children reflects the health of children in the community, and this forms the basis for the development of success–oriented interventional programmes

–(3). Malnutrition is globally the most important risk factor for morbidity and mortality, contributing to over 50% mortality rate in children worldwide (4).

Protein-energy malnutrition (PEM) has been a global nutritional problem (5), and it remains a point of interest especially because kwashiorkor and marasmus affects pharmacokinetics in children (6). Moreover, malnutrition is a known silent killer (7), and it is being speculated that up to 50% of Nigerian children are malnourished (8). As part of prioritizing the huge challenge in attaining improved nutritional outcomes for Nigeria because of lack of understanding of the issue and wrong priorities (9, 10), mothers are encouraged to adopt exclusive breastfeeding habits for their babies in the initial six months of their lives. However, the extent of success or prevalence of malnutrition among the people of Esan-land in Edo Nigeria is unknown.

Materials and methods

Study design: This was a cross-sectional descriptive study involving 300 mother-child dyads. Single-stage random sampling method was adopted, whereby the Edo Central Senatorial District constituted the population while each of the five local government areas represents a unit

Study location: This study was carried out in Edo Central Senatorial District Edo State, which is composed of five Local Government Areas including Esan Central, Esan North East, Esan South East, Esan West, and Igueben. The Esan-land is a homogeneous cultural region located in south-south geo-political zone Nigeria and the Esan people are traditionally known to be farmers.

Study Duration: The duration for the research work was from November 2018 to May 2019

Inclusion criteria: The study included all under – five children and their mothers in the five local government area who gave both verbal and written consent to be part of the research.

Exclusion criteria: The under- five children excluded from the study are those who were critically ill, those below six months of age and non-consenting mothers.

Sampling Method: A simple single-stage random sampling method was used to select 300mother-child dyads of under-five children for this study. Equal numbers (60x 5) mother and paired children under the age of five was drawn from the communities in each of the five Local government areas. Participants were recruited through the healthcare facility within a period of five weeks.

Ethical Consideration: The health research ethics committee of the Irrua Specfealist teaching hospital reviewed and approved the protocol before the field visit (Ref #: ISTH/HREC/20181116/131). Appropriate culture-sensitive and specific written informed consent was sought and obtained from the parents of the children prior to participants' recruitment. The researcher ensured privacy in handling the participants and confidentiality in handling the data. All examinations were done in a safe, comfortable, and private environment and the questionnaire was anonymous; the collected data was stored in a pass-worded computer only available to the principal investigator on a need-to-know basis. The data is available for inspection by regulatory authorities and for quality assurance for ten years

Study tools: Questionnaires for the data collection, and Shakir strip (MUAC tape), bathroom scale (Hana bathroom scale), statistical software, WHO age to height and weight to height standards (11).

Data Collection: Questionnaires were used to collect information in two sections. Section A of the questionnaire accessed socio-demographic data of the mothers as well as feeding pattern (frequency and practice of exclusive breastfeeding) that they fed their under- five children. Section B focused on the under- five children whereby the variables included age, anthropometric measures, appetite, and gender.

Thus, variables collected included characteristics of:

- Mothers: age, highest educational level, marital status, monthly feeding expenses, monthly income, occupation, and religion
- Mother-child pair: age, gender and immunization status children, as well as monthly feeding expense number of under-5 children of mothers.

Anthropometric measurements included height and weight for body mass index (BMI), and Tape for mid upper arm circumference (MUAC tape) was also collected. Though, for this report, only the MUAC has been used to define malnourishment if value is <125mm.

One research assistant (RA) from a health facility in each of the five LGAs. The Ras have at least a secondary school level of education and lives within the community. The RAs were trained by the researcher on the study objectives, purpose and interviewing techniques based on the research instrument. The training included demonstrations and practice in taking of anthropometric measurements, measurement of mid upper arm circumference and how to do physical examination through observation. Data was collected by the researcher with assistance from the research assistant on a weekly basis from the health facility.

Statistical Analysis:

Statistical analysis was performed using Statistical Package for the Social Science (IBM SPSS version 23.0). Descriptive statistics, T-test and Chi square test were used to describe and summarize the questionnaire data. Level of significance was judged at p <0.05.

Results

Table 1 presents the summary demography of the mothers. Among the 300 respondents, approximately 79% of the mothers were at least 26 years old, 67% have at least secondary level education, vast majority are married and a simple minority earn above minimum wage (Table1).

Compared to table 1 showing that only16% of the mothers earn over 35,000.00 per month,Table 2 shows the socio-economic characteristics of the mother-child pair and that approximately 13% spend more than 35,000.00 on feeding per month. Majority (44.7%) of the respondents had only two under-five children in the family while 6.7% had 4 and above.

The result in table 3 show the level of awareness, knowledge, and practice of adequate nutrition among the mothers feeding pattern and nutritional status of their children. For instance, 77% of the mothers indicated awareness of the relationship between nutritional status and feeding pattern, but a lower proportion have knowledge of adequate diet. On feeding patterns, 78% of mothers do exclusive breastfeeding and over 61% feed their babies more than thrice per day, but up to 18% of children have low appetite.

Table 4 presents results of statistical tests on the associations between average number of times fed daily and nutritional status ($\chi2 = 1.734$,df = 3, P = 0.629), the association between awareness of relationship between nutritional status and feeding pattern and practice of exclusive breastfeeding ($\chi2 = 10.956$, df = 1, P = 0.001) and association between knowledge of significant nutrients and practice of exclusive breastfeeding ($\chi2 = 14.131$, df = 1, P = 0.000).

Table 1: Demographic characteristics of mothers

Variables	Categories	Percentage (%)
Age (Years)	15 – 20	4.4
	21 – 25	17
	26 – 30	38.3
	31 and above	40.3
	Total	100
Educational Status	No formal education	5
	Primary school	27.3
	Secondary school	42
	Tertiary level	25.7
	Total	100
Marital Status	Single	14
	Married	81
	Divorced	1.3
	Widowed	3.7
	Total	100
Monthly Income (₦)	< 18,000	54
	18,000 – 35,000	30
	36,000 – 70,000	8.3
	>70,000	7.7
	Total	100
Occupation	Civil servant	20
	Housewife	14.7
	Farmer	16.3
	Businesswoman	49
	Total	100
Religion	Christianity	94.7
	Islam	5.3
	Total	100

Table 2: Socio-economic characteristics of mother-child pair of under-five children

Variables	Categories	Percentage (%)
Age of child	6 – 11 months	25
	1 – 2 years	33.3
	3 – 4 years	41.7
	Total	100
Gender of child	Male	46
	Female	54
	Total	100
Immunization status of child	Fully immunized	84
	Partially immunized	15.3
	Not immunized	0.7
	Total	100
Monthly feeding expense (₦) of mothers	< 10,000	11
	10,000 – 20,000	47.3
	21,000 – 35,000	29
	> 35,000	12.7
	Total	100
Number of under-5 children of mothers	1	29.7
	2	44.7
	3 to 4	19
	5 and above	6.7
	Total	100

Table3: Mother's knowledge & practice with feeding patterns and children's nutrition status

Variables	Category	Percentage
Awareness	Aware	77
	Not aware	23
Knowledge of significant nutrients	Knowledgeable	57
	Not Knowledgeable	43
Practice of exclusive breastfeeding	Exclusively breastfed	78
	Not exclusively breastfeed	22
Breastfeeding/day in the first 6-months	Once	0.7
	Twice	7.7
	Thrice	30
	Frequently	61.6
Appetite of child	Refusal to feed	3.3
	Low	14.7
	Normal	25.7
	High	57.3
Presence of malnutrition	Malnourished	35
	Well nourished	65
Type of malnutrition	Acute malnutrition	35.2
	Chronic malnutrition	65

Table 4: Outcome of Chi-Square analysis of significance in association

A: Averaged number of times of daily feeding vs. nutritional status

Averaged number of times of daily feeding						
Nutritional status	Once	Twice	Thrice	Frequently	Total	χ^2 test
	0	9	34	62	105	
Malnourished	0.00%	-8.60%	-32.40%	-59.00%	-100%	$\chi^2 = 1.734$
	2	14	56	123	195	df = 3
Not malnourished	-1.00%	-7.20%	-28.70%	-63.10%	-100	$P = 0.629$

B: Awareness* vs. practice of exclusive breastfeeding

Practice of exclusive breastfeeding	Aware	Unaware	Total	χ^2 test
Yes	185	50	235	$\chi^2 = 10.956$
	-78.70%	-21.30%	-100%	df = 1
No	38	27	65	$P = 0.001$
	-58.50%	-41.50%	-100.00%	

*Of the effects of feeding pattern on nutritional status

C: Knowledge vs. practice of exclusive breastfeeding

Practice of exclusive breastfeeding	Knowledgeable	Not knowledgeable	Total	χ^2 test
Yes	148	87	235	$\chi^2 = 14.131$
	-63.00%	-37.00%	-100%	df = 1
No	24	41	65	
	-36.90%	-63.10%	-100%	P = 0.000

DISCUSSION:

The research on the relationship between nutritional status and feeding pattern of the under five children in Edo State is characterized with the problems of unemployment, low per capital income, economic hardship, hunger and other related indicators. These conditions of living have been found to cause or worsen malnutrition.

Majority (79%) of the mothers were at least 26 years old, 67% have at least secondary level education, vast majority are married, and a simple minority earn above minimum wage. The study population was characterized with the problems of unemployment, low per capital income, economic hardship, hunger and other related indicators. These conditions of living have been found to cause or worsen malnutrition. The finding is in line with a study by Senbanjo et al. (12), which states that other risk factors besides inappropriate feeding practices need to be considered for higher prevalence of under nutrition among children in rural and sub- urban communities. The study explained that effective control of malnutrition should be concentrated on measures that addresses socioeconomic gaps between rural and urban communities. Another study reported that maternal socio-demographic and health profiles are important determinants of malnutrition in children which also aligns with the findings of this study(13).

From the results of this study, only 16% of the mothers earn over ₦35,000.00 per month with approximately 13% spending more than ₦35,000.00 on only feeding per month. Almost half (44.7%) of the respondents had two under-five children in the family. This further aligns with another report, which showed that the degree of mothers' adhere to recommended standards regarding under-five feeding is contingent on the socio-economic conditions of the child-bearing parents(14).

The result on table 2 shows that, majority (77%) of the mothers had the awareness on the relationship between nutritional status and feeding pattern of their children; on the feeding patterns, 78% of mothers do exclusive breastfeeding, 61% fed their babies more than thrice per day, but up to 18% of children have low appetite. The study revealed that the frequency of feeding of the children was according to their ages. For example, a six- months one week child may be fed with complementary feed once or twice daily in addition to breast milk on demand, allowing a gradual and appropriate transition to an adequate family diet; while a 3-year-old child may be fed thrice daily or more frequently. However, the quality of the diet (complementary or family foods) in term of nutrient density still remains a challenge. This is an exception to infants who are just transiting from exclusive breastfeeding to complementary feeding as the breast milk remains adequate in the first six months of life(15).

A close look at the distribution of the respondents' nutritional intake/appetite shows that a very small proportion of the children refused feed. Refusal to feed in children is mainly link to poor health and nutritional status which on the long run would lead to severe acute malnutrition(16).

This finding is in line with a study done by Imam et al (17); the study revealed that malnutrition is a major health problem in hospitalized pediatric patients. It is reported that the number of malnourished pediatric patients varies between 21% and 80% according to the level of the country's development. Therefore, It is essential

that patients who are malnourished or at risk for malnutrition are identified as soon as they are admitted to the hospital. Low appetite on the other hand is related to micronutrient deficiency, which is one consequences of consuming inadequate diet. So, a normal and high food intake may be an indicator of good health (18). Therefore, from our finding, we can infer that majority of the under five children are healthy although the risk of malnutrition increases with the commencement of complementary feeding, most especially when the feed is inadequate or not properly introduced (19); our study suggests that factors such as the exposure/experience of the mothers; the older the age of the mother, the more the exposure/experience or awareness of the significant nutrient in their children's foods including the practice of exclusive breastfeeding and the relationship between nutritional status and feeding patterns may be related to prevalence of malnutrition in children. This is in line with a study carried out by Abolurin et al(20).

Regarding the factors that affect the nutritional status and the feeding patterns of the children, certain factors like maternal level of awareness, educational status, number of under five children in the family, knowledge of the relationship between nutritional status and feeding pattern and significant nutrients among others affect the nutritional status and feeding pattern of the under five children in Edo Central Senatorial District. This finding agrees with a study by Phukan et al(21).

Limitations of the Study: The study was carried out in Edo Central Senatorial District with sample drawn randomly from five communities, namely: Ekpoma, Irrua, Uromi, Ugueben and Ubiaja in Edo State. This population however may not be generalizable beyond Edo State, Nigeria.
The sample size for this study is limited to 300 under- five children. Higher sample size could increase the precision and accuracy of the result.
Some of the factors that are significant may have been affected by some confounders for which a regression analysis would have addressed; but due to time limit, it was not done. A follow-up study design is much better to assess the nutritional status of the under – five children in Edo State.

Conclusion
Chronic malnutrition is the major form of malnutrition in Edo Central Senatorial District, Edo State which is mainly associated with the socio-economic state of the people in Edo Central Senatorial District. Not knowledgeable of the significant nutrients and good feeding patterns has a significant relationship with the nutritional status of under-five children.

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