



ORIGINAL ARTICLE

Knowledge of Factors Contributing to Child Malnutrition among Mothers of Under-five Children in Sokoto Metropolis, North-West Nigeria

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Keywords

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ABSTRACT

Background: Malnutrition remains a killer of children, especially in Sub-Saharan Africa. In Nigeria, malnutrition is among the top five killers of children under five years of age. This study aimed to assess the knowledge of factors contributing to child malnutrition among mothers of under-fives.

Methods: A cross-sectional study was conducted among 347 mothers of under-five children who were selected using a multistage sampling technique from January to March 2018. Data were collected using an interviewer-administered questionnaire. Data were analysed using IBM SPSS® version 20.0. Descriptive statistics, crude and adjusted Odds Ratio (OR) with 95% Confidence Interval (CI) in cross-tabulation and binary logistic regression analysis, respectively, were estimated.

Results: More than half, 198 (57.0%) were aged 40 years and below. Most, 324 (93.4%) of the respondents were Hausas, with only 45 (13.0%) having tertiary education. Majority of the respondents, 326 (93.9%) knew that diarrhoea-causing diseases could lead to malnutrition. About two-thirds, 222 (64.0%) knew that deworming could protect a child from malnutrition. Less than half, 169 (48.7%) did not know that overeating starchy food can cause malnutrition. Overall, majority 216 [62.2% (95% CI = 56.9% - 67.4%)] of the respondents had good knowledge of factors associated with malnutrition. There were no statistically significant predictors of knowledge of factors contributing to malnutrition.

Conclusion: Mothers of under-five children in Sokoto metropolis had a high level of knowledge of the factors contributing to child malnutrition. However, there is still a need to continue educating mothers of under-five children on the importance of maintaining proper nutrition for their children.

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INTRODUCTION

A great start in life can be achieved by optimising nutrition early in life including the 1000 days from conception to a child's

second birthday.¹ About half of the deaths occurring in children under five years of age are linked to undernutrition.^{1,2} Undernutrition puts children at higher risk

of dying from common infections, increasing the frequency and severity of such diseases, and delaying recovery.² Malnutrition increases health care costs, reduces productivity and slows economic growth, which can perpetuate a cycle of poverty and ill-health.¹ These are most prevalent in low- and middle-income countries, including Nigeria.¹ In Nigeria, only 64% of children under five years are thriving without any nutritional problems, implying that roughly one out of every 3 children has some form of nutritional deficit.³ The highest burden of malnutrition in Nigeria is in the north, especially north-west and north-east where the prevalence of acute malnutrition among children 6-59 month is above the national average of 7% and prevalence of stunting above 40%.³ Sokoto State, located in north-western Nigeria, has the highest prevalence (20%) of wasting.⁴

Poverty, food insecurity, and illiteracy are the top three leading causes of malnutrition.⁵ Other factors contributing to malnutrition are financial constraints, inadequate food intake, ill-health and improper care of children. Furthermore, a heavy workload for mothers, local cultural beliefs that severe malnutrition is due to witchcraft and the violation of sexual taboos are other factors contributing to malnutrition.⁶ Studies have shown that illiterate mothers are more likely to have inadequate knowledge about the nutritional requirement of their children, which results in unhealthy feeding practices.⁷⁻⁹ There are several studies on caregivers' knowledge of malnutrition.¹⁰⁻¹⁴ These studies have

assessed caregivers' knowledge of the importance of colostrum, initiation of breastfeeding, knowledge of malnutrition and its management; however, there is a dearth of literature on caregivers' knowledge of factors contributing to malnutrition. Caregivers' knowledge of risk factors of malnutrition plays a vital role in the prevention of undernutrition among under-fives by allowing the mothers to make an informed decision on a balanced diet and appropriate meal for age and also avoiding practices that are detrimental to a child's nutritional status.¹⁴ Sokoto is one of the epicentres of malnutrition in the country,¹⁵ hence the need for this study. Therefore, the objectives of this study were to assess the knowledge of factors contributing to malnutrition among mothers of under-five children and to determine the factors that predict their knowledge.

METHODOLOGY

Study area: This study was conducted in Sokoto metropolis, which consists of four LGAs: Sokoto-north, Sokoto-south, Wamakko and some parts of Dange Shuni. Sokoto State has a low literacy rate of 20.1% in western education among women, which is far below the national average of 59.3%.¹⁵ Women in the area are mostly financially dependent on their husbands, and the husband and his parents make most decisions on how to run the family and health issues. The typical food crops in Sokoto State include millet, guinea corn, maize, rice, beans, wheat, cassava, potatoes, groundnut and sugar cane. Fruits

and vegetables grown in Sokoto include oranges, mangoes, bananas, lettuce, spinach, cabbage and pawpaw. Weaning practice is poor in Sokoto with almost 50% of mothers introducing complementary feeds at the wrong time (too early or too late) and giving poorly fortified or unfortified pap.¹⁶

Study design and population: A cross-sectional study design was used and the study population comprised of all the mothers of under-five children in Sokoto metropolis. The study spanned from January to March 2018.

Sample size determination and sampling technique: The sample size for the study was determined using Fisher's formula for calculating sample size for a cross-sectional study,¹⁷ $n = Z_{\alpha}pq/d^2$ with a 31.8% prevalence of good knowledge observed from a previous study,¹⁸ a precision level of 5%, and an anticipated response rate of 95%. A total of 350 mothers were enrolled in the study. Eligible mothers were selected using a multistage sampling technique. At the first stage, Wammako LGA was selected by balloting out of the four metropolitan LGAs; the second stage involved a random selection of two wards, Arkilla and Kalambaina from eleven wards through balloting. At the third stage, four settlements, two from Arkilla (Gwiwa, 240 households and Badon ukku-ukku, 203 households) and two from Kalambaina (Bakin kusu, 172 households and Gidan gamba, 118 households) were selected by balloting; and the fourth stage, the selection

of households was made using a systematic sampling method after proportionate allocation for each of the selected settlement was done. When a house was picked, and it happened to be ineligible (i.e. no mother of under-five in the household), the next household was chosen, and then the sampling interval was continued. Where more than one mother was eligible in a household, simple random sampling by balloting was used to choose a respondent among them. A total of 212 households (Gwiwa, 115 and Badon ukku-ukku, 97) in Arkilla ward and 138 in Kalambaina (Bakin kusu, 82 and Gidan gamba, 56) were selected and one mother from each household was the unit of enquiry.

Data collection and analysis: An interviewer-administered structured questionnaire was used to collect information on the sociodemographic profile, awareness and knowledge of factors associated with malnutrition. The level of knowledge of respondents was determined by scoring the questions that assessed knowledge. For any response, a correct answer was scored 1, and a wrong answer was scored 0. The aggregate score for each respondent in percentage was graded into good knowledge (score $\geq 75\%$) and poor knowledge (score $< 75\%$).¹⁹ Six final year medical students were trained for data collection. The content of the training included objectives of the studies, ethics of research and the use of Open Data Kit (ODK) that was used for data collection. The questionnaire was pretested in 21 households in communities not selected for the study. Following the

pretesting, some ambiguous questions were modified, and some unnecessary questions were expunged. Descriptive statistics such as mean, median, standard deviation (SD) and interquartile range were done for continuous variables, whereas, categorical variables were presented in frequencies and proportions. Crude Odds Ratio (cOR) and adjusted Odds Ratio (aOR) were reported for bivariate and multivariate analysis, respectively, with 95% Confidence Interval (CI). For all analyses, the level of significance was set at $p < 0.05$.

Ethical consideration: Ethical approval was obtained from the Sokoto State Ministry of Health Research Ethics Committee. Written informed consent was obtained from the respondents before the questionnaire was administered. All information sought were handled with the utmost confidentiality. Research assistants were trained not to disclose any information or make comments or any judgments with regards to anything observed at the residence of the respondents.

RESULTS

A total of 350 mothers of under-five children were recruited into the study. Three of the mothers declined, giving a response rate of 99% (347 respondents). The median age was 30 years (with an interquartile range of 25-40 years). More than half of the respondents, 198 (57.0%) were aged 40 years and below. Most, 324 (93.4%) of the respondents belong to the Hausa ethnic group. Only 45 (13.0%) and 150 (43.3%) of

mothers and fathers respectively, had tertiary education. More than two-thirds, 303 (87.3%) of the mothers were married, and 228 (65.7%) were housewives (Table 1). The majority of the respondents 326 (93.9%) knew that malnutrition could be caused by the presence of diseases and infections that cause diarrhoea. Three hundred and twenty-one, (92.5%) knew that poor maternal understanding of nutritious diet could predispose their child to malnutrition. Most, 318 (91.6%) knew that neglected children and orphans are at risk of malnutrition; and inadequate food intake can predispose a child to malnutrition. Three hundred and fourteen (90.5%) knew that malnutrition was common among the low-income group. More than half, 222 (64.0%) knew that deworming can protect a child from malnutrition. Less than half, 169 (48.7%) did not know that overeating starchy food can cause malnutrition. Overall, 216 (62.2%; 95% CI = 56.9% - 67.4%) of the respondents had good knowledge of factors associated with malnutrition with a mean knowledge score of 78.3 ± 14.2 (Table 2).

A higher proportion of mothers with formal education, 122 (63.9%) compared to those with no formal education, 94 (60.3%) had better knowledge; however, this was not statistically significant, $p = 0.489$. Similarly, a higher proportion of fathers with formal education, 155 (62.8%) compared to those with no formal education, 61 (60.1%) had good knowledge; and this finding was also not statistically significant, $p = 0.760$. A higher proportion of respondents in a

polygamous setting, 79 (63.7%) had good knowledge compared to those in Monogamous setting, 137 (61.4%); but the difference was not statistically significant, $p = 0.675$ (Table 3). Respondents who were less than 40 years were more likely to have good knowledge of factors contributing to child malnutrition (aOR: 1.2; 95%CI = 0.7 - 2.0); however, this was not statistically significant, $p = 0.576$. Similarly, mothers with formal education were more likely to have good knowledge (aOR: 1.5; 95%CI = 0.9 -2.7) also, this was not statistically significant. (Table 4)

DISCUSSION

This study assessed the knowledge of factors contributing to child malnutrition among mothers of under-five children and to also identify factors that predict their knowledge. We found that almost all the mothers knew that disease conditions that cause diarrhoea could lead to malnutrition. This finding is of significant public health importance because, mothers can take appropriate early actions when their babies are sick with diarrhoea – a disease that is quite common in our environment. However, it has been shown that having such knowledge does not always translate into practice.²⁰ We also found in this study that the majority of mothers of under-five children knew that inadequate intake could predispose a child to malnutrition. This finding is surprising, as Sokoto State has

the highest prevalence of wasting in Nigeria.⁴

Table 1: Socio-demographic profile of respondents

Variables	Frequency (n = 347)	Percent
Age group (years)		
≤40	198	57.0
>40	149	43.0
Ethnic group		
Hausa	324	93.4
Others*	23	6.6
Religion		
Islam	342	98.6
Christianity	5	1.4
Mother's Education		
None	31	8.9
Quranic school only	125	36.0
Primary	48	13.8
Secondary	98	28.3
Tertiary	45	13.0
Father's Education		
none	33	9.5
Quranic school only	67	19.3
Primary	13	3.7
Secondary	84	24.2
Tertiary	150	43.3
Marital status		
Married	303	87.3
Separated	4	1.2
Divorced	19	5.5
Widowed	21	6.0
Family type		
Monogamous	223	64.3
Polygamous	124	35.7
Mother's occupation		
Student	31	8.9
Self employed	66	19.0
Housewife	228	65.7
Civil servant	20	5.8
Others	2	0.6
Father's occupation		
Student	9	2.6
Farmer	42	12.1
Self employed	89	25.6
Civil servant	152	43.8
Unemployed	29	9.6
Others	26	6.3
Monthly income (₦)		
<18,000	140	40.3
≥ 18,000	207	59.7

*Others = Yoruba, Ibo, Nupe, Igbira

Table 2: Knowledge of factors associated with malnutrition among respondents

Variables	Correct responses n	Percent
The presence of diseases and infections that cause diarrhoea can lead to malnutrition	326	93.9
Mother's poor understanding of nutritious diet can predispose their children to malnutrition	321	92.5
Neglected children, orphans and those living in care homes are at risk of malnutrition	318	91.6
Inadequate food intake can predispose a child to malnutrition	318	91.6
Malnutrition is common among the low-income group	314	90.5
There is a link between breastfeeding and optimal growth of the children	314	90.5
Living in a large household family setting can restrict mothers' ability to monitor her children's feeding habit	303	87.3
Lack of immunisation to specific disease can lead to malnutrition	290	83.6
Inadequate financial resources limiting access to healthy food can result in malnutrition	289	83.3
Long term breastfeeding without complementary feeding contributes to malnutrition	288	83.0
Fruits can protect your child from infectious diseases	277	79.8
Keeping a child with alternate caregivers or nannies can predispose the child to malnutrition	257	74.1
Children who were not exclusively breastfed can be malnourished	233	67.1
Deworming can protect a child from malnutrition	222	64.0
Overeating starchy food can cause malnutrition	169	48.7
Overall knowledge grading		
Good knowledge	216	62.2
Poor knowledge	131	37.8

(n =347)

Therefore, other factors such as poverty, cultural practices and social dependence of women, especially in Northern Nigeria could be contributing to the high prevalence of malnutrition, despite adequate knowledge.^{5,6} A high proportion of the mothers knew that having children in a large household family could affect the mothers' ability to monitor the feeding of their children. However, knowledge seems not to be translated to practice as it is common for people in northern Nigeria to have lots of children in a

polygamous setting. Empirical evidence shows that having more children tend to increase competition for childcare resources within the household such that a child is denied adequate nutritional care.²¹ Most of the mothers were aware that there is a link between breastfeeding and optimal growth of their children. This finding is encouraging, as it has been shown that mothers' knowledge of feeding is vital for a positive nutritional outcome for the child.²²

Table 3: Association between knowledge of factors contributing to child malnutrition and respondents' sociodemographic profile

Variables	Knowledge		Chi-square	p-value
	Good (n=216) n (%)	Poor (n=131) n (%)		
Age group (years)				
<40	151 (61.6)	94 (38.4)	0.134	0.714
≥40	65 (63.7)	37 (36.6)		
Tribe				
Hausa	200 (61.7)	124 (38.3)	0.561	0.454
Others	16 (69.6)	7 (30.4)		
Mother's education				
No formal education	94 (60.3)	62 (39.7)	0.478	0.489
Formal education	122 (63.9)	69 (36.1)		
Father's education				
No formal education	61 (60.1)	39 (39.0)	0.093	0.760
Formal education	155 (62.8)	92 (37.2)		
Marital status				
Not married	23 (52.3)	21 (47.7)	2.134	0.144
Married	193 (63.7)	110 (36.3)		
Family type				
Monogamous	137 (61.4)	86 (38.6)	0.175	0.675
Polygamous	79 (63.7)	45 (36.3)		
Monthly income (₦)				
<18,000	88 (62.9)	52 (37.1)	0.037	0.847
≥18,000	128 (61.8)	79 (38.2)		
Mother's occupation				
Unemployed	204 (62.4)	123 (37.6)	0.046	0.831
Employed	12 (60.0)	8 (40.0)		
Father's occupation				
Unemployed	119 (61.0)	76 (39.0)	0.283	0.595
Employed	97 (63.8)	55 (36.2)		

Table 4: Logistic regression analysis of predictors of respondents' knowledge of risk factors of child malnutrition

Variables	cOR (95%CI)	aOR (95%CI)	p-value
Age less than 40 years	0.9 (0.6 - 1.5)	1.2 (0.7 -2.0)	0.576
Hausa tribe	0.7 (0.3 - 1.8)	1.5 (0.6 -3.9)	0.365
Mother having formal education	0.9 (0.6 - 1.3)	1.5 (0.9 -2.7)	0.160
Father having formal education	0.9 (0.6 - 1.5)	0.9 (0.5 -1.7)	0.790
Not being married	0.6 (0.3 - 1.2)	2.0 (1.0 -4.2)	0.053
Income less than 18 thousand Naira monthly	1.0 (0.7 - 1.6)	0.9 (0.5 -1.5)	0.671
Mother being unemployed	1.1 (0.4 - 2.8)	1.1 (0.6 -1.8)	0.825
Father being unemployed	0.9 (0.6 - 1.5)	1.7 (1.0 -3.0)	0.063
Having a monogamous family setting	0.9 (0.6 - 1.4)	1.2 (0.7 -1.9)	0.562

cOR = crude Odds Ratio **aOR** = adjusted Odds Ratio

Less than half of the mothers knew that overeating starchy food could cause malnutrition. This could be an indication that health talks on nutrition are focused on only protein-energy malnutrition, and less attention is given to obesity which is also a

form of malnutrition. This finding indicates that mothers do not have adequate knowledge concerning the types of food or healthy diets required by their children for healthy growth and development. Due to this poor knowledge, mothers may not be giving the right combination of foods to their children which could be contributing to malnutrition.

We found that more than 60% of mothers had good overall knowledge of factors contributing to malnutrition among under-fives. This finding is encouraging because a high proportion of the mothers do not have formal education. This finding is similar to what was reported in a study in Ethiopia, where most of the respondents had good knowledge regarding child nutrition.²³ However, the result contradicts the findings of a study conducted in Ghana, where only 31.8% of the respondents had good knowledge regarding child malnutrition.¹⁸ The difference in the mothers' knowledge level may be because our study was conducted in an urban area. In contrast, the study in Ghana was conducted in a rural area.

People in the urban areas have better access to hospitals, health professionals and other health care services where health talks and health education are given more attention. These could reflect favourably in terms of the type and quality of health information provided to mothers in the urban settings and thus their knowledge levels. In addition, the higher proportion of mothers with good knowledge observed in

this study may be due to better access to transportation (which increases their access to health facilities and health workers) and electricity which increases their access to health information passed through mass media such as radio, television and internet. The higher proportion of good knowledge observed in this study may also be attributable to the previous efforts of the Sokoto State government and partners in raising public awareness about malnutrition and its causative factors through mass media. It is impressive that a high proportion of the mothers had good knowledge of factors contributing to malnutrition; however, this does not reflect the nutritional status in the state with one of the worst nutritional indices in Nigeria.⁴

A higher proportion of mothers with formal education were more likely to have good knowledge of factors contributing to malnutrition. Although this finding did not achieve statistical significance, a previous study in Oman showed that mothers' educational status was associated with nutritional knowledge.²⁴ The finding in this study is worrisome as almost half of the mothers do not have formal education. Although it has been shown that mothers' knowledge of health and nutrition may substitute for formal education in reducing malnutrition; however, the present level of mothers' education in Nigeria, especially in rural areas appears insufficient to reinforce knowledge in producing better nutrition outcomes for children.²² None of the sociodemographic characteristics was

significant predictors of knowledge in this study.

Conclusion: The mothers of under-five children in Sokoto metropolis had a high level of knowledge of factors contributing to child malnutrition. We recommend that government at all levels, as well as healthcare workers at all levels of healthcare delivery, increase their effort in reinforcing mothers knowledge on the common health problems of children including malnutrition, and the factors contributing to its causation. Health talks should also include sessions incorporating education of mothers on elemental food compositions and how to combine locally available food products to achieve a balanced meal.

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Conflict of interest: The authors declare that they have no conflict of interest

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