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Factors associated with diarrhea prevention among mothers of under-five children in Calabar Municipality, Cross River State, Nigeria

Ekpenyong N. O[1,2], Isika A. I[1,2], EnaguM. A[1,2], Umoh A. U[1], Urom D. S[1], Freedman A. B[1], Nwoha D. C.[2]

[1]Department of Community Medicine, University of Calabar, Calabar, Cross River State, Nigeria
[2]Department of Community Medicine, University of Calabar Teaching Hospital, Calabar, Cross River State, Nigeria

Abstract

Introduction: Despite readily available preventive interventions, diarrhea prevalence has remained relatively stable over the decades as the interventions are not effectively implemented on many children leading to high morbidity and mortality especially among under five children. This study investigated the factors associated diarrhea prevention among mothers of under-five Children in Calabar Municipality, Cross River State, Nigeria.
Methodology: This was a community based descriptive cross-sectional study carried out among 314 caregivers of under-five children selected through systematic random sampling method and data were obtained using semi-structured, pre-tested, interviewer-administered questionnaire and analyzed using SPSS version 25 and significance set at $p<0.05$.
Results: The mean age of mothers for this study was 30.7 ± 5.31, with majority of the respondents being 26-30 years (43.3%), married (85.7%), and had tertiary education (64.6%). The prevalence of diarrhea in the last one year among under-five children in the study population was 53.2%. Only 34.4% of respondent had a good knowledge of diarrhea prevention, with 22.9% having poor practices of diarrhea prevention. Factors associated with knowledge of diarrhea prevention were mothers' educational level, number of children under-five years, husbands' occupation and average income of the mothers. ($p<0.05$) Knowledge of diarrhoea prevention, age of respondents, religion, place of ANC and delivery were statistically associated with practice of diarrhea prevention. ($p<0.05$). These findings have implication for policy makers and stakeholders to improve the knowledge of diarrhea prevention and treatment among mothers of under-fives through health education, awareness campaigns and use of community champions

KEYWORDS: Diarrhea, Diarrhea prevention, Diarrhea treatment, Under-five, Cross River State, Nigeria

Introduction

Diarrheal disease remains one of the most important causes of morbidity and mortality among under-five children in developing countries, especially in African countries including Nigeria.[1] According to the World Health organization (WHO) and UNICEF, there are about two billion cases of diarrheal disease worldwide every year and 1.9 million children younger than 5 years of age die annually mostly in developing countries.[2] Diarrheal disease in Africa was responsible for an estimated 30 million cases of severe diarrhea and 330,000 deaths in 2015.[3] It accounted for 9% of all under 5 deaths which was greater than the mortality arising from Malaria, HIV and Measles combined, the under-five mortalities have continued to spike despite medical intervention protocols.[4]

The Sustainable Development Goals (SDGs) calls on all countries to reduce under-five mortality to less than 25 per 1000 live births by 2030.[5] Nigeria loses about 2,300 under five children every day making the

Corresponding Author:
Ekpenyong Nnette
Department of Community Medicine, University of Calabar, Calabar, Cross River State, Nigeria.

nnekon2015@gmail.com

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country the second largest contributor to under-five mortality rate in the world.[6] More recently, death from diarrhea in Nigeria among children reached 144,724 or 9.77% of total death.[7] Nigeria faces a disproportionately large burden of childhood diarrhea deaths. The incidence of diarrheal disease varies greatly with the seasons and a child's age; the youngest children are most vulnerable with incidence being highest in the first two years of life and declines as the child grows older.

The infection is endemic and outbreaks are not unusual in Nigeria. Diarrhea is usually a symptom of an infection in the intestinal tract, which could be caused by a variety of bacterial, viral and parasitic organisms. However, rotavirus with estimated pooled prevalence of 31.0 % (95 % CI 24.0–39.0) predominated in all primary care visits and hospitalizations.[8] Infection is spread through contaminated food or drinking water or from person to person as a result of poor hygiene. A significant proportion of this disease can be prevented through safe drinking water and adequate sanitation and hygiene. Prevention can be through good hygiene, adequate diet, adequate health care, breastfeeding and immunization. Death from diarrhea is mainly due to loss of water and essential minerals. These can be compensated in most cases by an oral rehydration solution (ORS), Other remedies applied in diarrhea management are continued breastfeeding, non-stop feeding during diarrhea, regular consumption of nutrient rich foods, probiotics and zinc supplementation.[9] The timely administration of oral rehydration solution (ORS), exclusive breastfeeding, zinc tablets, vitamin A supplementation, safe water, good sanitation, and the use of antibiotics have proven to be both cost effective and efficacious as primary intervention for preventing diarrhea morbidity. Despite these interventions, diarrhea prevalence has remained relatively stable over two decades as the interventions are not effectively implemented on many children. For instance, only 39% of children with diarrhea are exclusively breastfed and only 39% of children with diarrhea receive oral rehydration therapy[10] This combination of high cause-specific mortality and the existence of an effective remedy make diarrhea and its treatment a priority concern for health services.

Furthermore, WHO recommend that mothers and caregivers should be able to identify the signs of dehydration including excessive thirst, sunken eyes, reduced urine output, excessive drowsiness, poor skin turgor, restlessness and absence of tears.[6] Accurate knowledge regarding signs and symptoms, spread, prevention and healthy practices like exclusive breastfeeding, immunization, ORS, good sanitation such as regular hand washing[11] are essential to prevent morbidity and mortality.[9] Results of some studies[9,12] have demonstrated inadequate knowledge and poor practice of diarrheal prevention. It is known that knowledge in every given population play very important roles on practices. Hence, knowledge of diarrhea prevention could also affect the practice of diarrhea prevention &treatment among mothers / caregivers of under-five. We therefore investigated the knowledge of diarrhea prevention and associated factors among mothers of under Five Children in a suburb community of Calabar Municipality Local Government Area, Cross River State, Nigeria.

Materials and methods

This study was conducted among mothers of under five in Nyagasang community at Atimbo which is a suburb community in Calabar Municipality, Cross River state. The community is bounded in the north by Ikot Omin, in the south by Calabar south, in the east by Ikot Offiong and in the west by Edibe Qua town, with a population of approximately 12,000 people. Nyagasang is densely populated suburbs of Calabar, inhabited by the Efik and Ejagham tribe. There are also non-indigenous inhabitants of the community (Ibibio, Igbo, Hausa and Yoruba). The main source of water supply is borehole. Toilet types are water closet and ventilation improved pit latrine. The people are mainly civil servants, traders and farmers. Amenities available in the community include a Primary Health Care Center and also public and private schools, markets and churches.

This was a community based descriptive cross-sectional study where a systematic random sampling method was used to recruit 314 eligible and consenting mothers/caregivers of under-five children in Nyaghasang, community of Calabar Municipality LGA of Cross River State were studied.

A semi-structured, interviewer-administered, pretested questionnaire was used to elicit information from respondents on the socio-demographic, knowledge of diarrhea prevention and practices of diarrhea prevention from the respondents.

A total of 27 questions assessed knowledge with responses ranged from 'yes' to 'no' and 'don't know'. A score of zero was allocated to respondents who responded "No" and "I don't know" or incorrectly,

while a score of one was allocated to respondents that responded "Yes" or correctly. A score percentage of <50% was considered to signify poor knowledge, 50-75% was considered to be fair knowledge and above 75% to be good knowledge. Five questions were used to assess practice and scores was allocated as was done for knowledge. For postnatal care, complete immunization schedule for age and exclusive breastfeeding, a score of zero was awarded to those that responded "No" or "I don't know" while a score of one was awarded to those that responded "Yes"[13]

The result from this study was analyzed with Statistical Package for Social Science (SPSS) software version 25. Frequency of variables, measures of central tendencies and dispersions including means and standard deviations was generated; tabulations and percentages was used to illustrate study findings and bivariate analysis was carried out. The outcome variable was knowledge and practice of diarrhea prevention of mothers of under five children. P – value was set at 0.05.

Ethical approval was obtained from the University of Calabar Teaching Hospital Health Research and Ethical Committee (HREC) The village head of Nyagasang was duly informed and consent was obtained. Informed consent was obtained from all participants before administration of the questionnaire.

Results

All eligible mothers who consented were included in the study and we had a response rate of 100%

Table 1 shows the socio-demographic characteristics of the 314 mothers of under five children interviewed in Nyagasang community, Atimbo, Calabar Municipality with ages ranging between 20 and 45 years and mean age being 30.7 ± 5.31.Majority of the respondents were within the age group 26-30 years (43.3%), married (85.7%), had attained tertiary level of education (64.6%), Christians (99.4%), had one child under five years (49.8%), and had 2years as the age of their last child (31.8%)

Table 2 shows that most of the respondents were civil servants (39.5%), most had husbands who were Civil/Public servants (40.6%) and most had an average monthly income of 10,000-50,000 (41.4%).

Table 3 shows that 167(53.2%) of respondents had under-five children who have had at least an episode of diarrhea within the last 1 year. The greatest number of episodes had was 2 episodes 128(76.6%). The most predominant age for the under-five children who had diarrhea in the past 1 year was 13-36 months (59.8%)

Figure 1 shows that of the 314 respondents interviewed, 12.4% had poor knowledge of diarrhea prevention and treatment, 53.2% had fair knowledge while 34.4% were found to have good knowledge.

Table 4 shows the respondents practices towards diarrhea prevention and treatment. Of the 314 respondents 266(84.7%) followed up with post-natal care of their child, 249(79.3%) had completed the immunization schedule corresponding to the age of

Table 1: Socio-demographic characteristics of mothers of under 5s in Nyaghasang community Cross River State. 2023

VARIABLES	FREQUENCY	PERCENTAGE
Mothers age group		
<20	3	1.0
21 – 25	42	13.4
26 – 30	136	43.3
31 – 35	82	26.1
36 40	34	10.8
>40	17	5.4
Marital status		
Single	34	10.8
Married	269	85.7
Divorced	7	2.2
Widowed	4	1.3
Educational level		
None	4	1.3
Primary	14	4.5
Secondary	93	29.6
Tertiary	203	64.6
Religion		
Christianity	312	99.4
Islam	2	0.6
Number of children under five		
One	155	49.8
Two	128	41.2
Three	26	8.4
Four	2	0.6
Age of last child as at last birthday (in years)		
<12 months	33	10.5
13-24 months	54	17.2
25-36 months	100	31.8
36-48 months	57	18.8
>48 months	68	21.7

Table 2: Economic Characteristics of mothers of under-5s in Nyaghasang community Cross River State. 2023

VARIABLES	FREQUENCY	PERCENTAGE
Occupation		
Farmer	8	2.5
Trader	83	26.4
Housewife	73	23.2
Civil Servant	124	39.5
Seamstress	7	2.2
Business	19	6.2
Family average monthly income		
<10.000	8	2.5
10.000 - 50.000	130	41.4
50.000 - 100.000	97	30.9
>10.000	79	25.2
Husband's occupation		
Professionals	74	23.6
Civil Servants/Public Servants	127	40.6
Trader	76	24.3
Unemployed	30	9.3
Vocational Workers	7	2.2

Table 3: Prevalence of diarrhea among under five children in Nyaghasang community Cross River State. 2023

VARIABLE	FREQUENCY	PERCENTAGE
Child had diarrhea in the last 1 year		
Yes	167	53.2
No	147	46.8
Number of episodes		
1 Episode	13	7.8
2 Episodes	128	76.6
3 Episodes	26	15.6
Age of the children in months		
6-12 months	26	15.6
13-24 months	51	30.5
25-36 months	49	29.3
36-48 months	27	16.2
>48 months	14	8.4

Table 4: Practices on Diarrhea prevention and treatmentamong under 5s in Nyaghasang community Cross River State. 2023

VARIABLES	FREQUENCY	PERCENTAGE
Post natal care of child		
YES	266	84.7
NO	48	15.3
Complete immunization schedule corresponding to age of child		
YES	249	79.3
NO	65	20.7
Exclusive breastfeeding		
YES	222	70.7
NO	92	29.3
Treatment practice outside admission in the hospital		
ORS	56	57.2
Hospital	2	2.0
Herbal mixture/Homemade drinks	9	9.2
Drugs from Pharmacy	29	29.6
Breastmilk	2	2.0

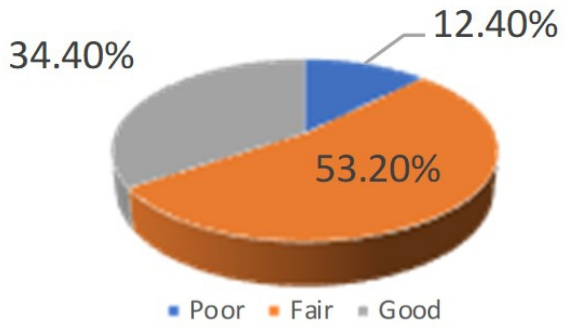

Figure 1: Knowledge of diarrhea prevention and treatment of caregivers of U5 in in Nyaghasang community Cross River State. 2023

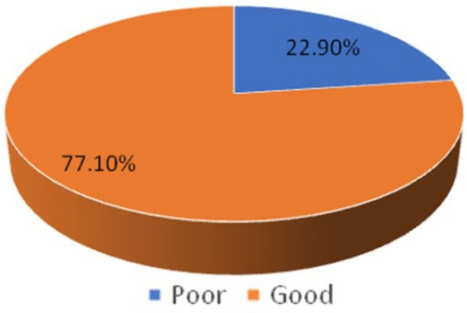

Figure 2: Practice score on diarrhea prevention and treatment of mothers of under 5s in Nyaghasang community Cross River State. 2023

their child, and 222(70.7%) said to have practiced exclusive breastfeeding on their child. When interviewed on what was done for their child that had diarrhea and was not admitted in the hospital, of the 98 that responded 56(57.2%) gave ORS, 29(29.6%) got drugs from the pharmacy, 9(9.2%) gave herbal mixtures/homemade fluids, 2(2%) gave breastmilk and 2(2%) took the child to the hospital but didn't get admitted.

Figure 2 shows that 22.9% of the respondents were found to have poor practices and 77.1% of the respondents were shown to have good practices on diarrhea prevention and treatment.

The result in table 5 showed significant relationship between the educational level of the respondents and their knowledge of diarrhea prevention and treatment ($p = 0.000$). The proportion of those with good knowledge was more among those with tertiary education as compared to those with secondary or primary education. Also, the relationship between the number of children under five years a woman has and knowledge of diarrhea prevention and treatment was shown to be significantly associated ($p = 0.009$). There was a significant relationship between husband's occupation and knowledge of diarrhea prevention and treatment ($p = 0.013$). The proportion of good knowledge was shown to be high in respondents whose husbands were professionals, businessmen/traders and civil/public servants compared to other professions. The relationship between average monthly income and knowledge of diarrhea prevention and treatment was shown to also be significant ($p = 0.000$). The proportion of good and fair knowledge is shown to be higher in respondents who earn between 10,000 to >100,000 compared to those who earn less than 10,000.

Table 6 shows there was a significant relationship between the ages of the respondents and their practices on diarrhea prevention and treatment ($p = 0.000$). The proportion of those with good practice on diarrhea prevention and treatment was shown to be higher in respondents between the ages of 25 and 36. The relationship between the educational level of the respondents and the practices on diarrhea prevention and treatment of the respondents was significant ($p = 0.000$). It was also shown that knowledge and

Table 5: Factors affecting Knowledge of mothers of under five children on diarrhea prevention and treatment in Nyaghasang community Cross River State. 2023

Variables	Good knowledge	Fair Knowledge	Poor knowledge	Chi-square	P-value
Mothers Educational level					
None	0(0%)	1(0.6%)	3(7.7%)	33.706	0.000*
Primary	2(1.9%)	6(3.6%)	6(15.4%)		
Secondary	26(24.1%)	53(31.7%)	14(35.9%)		
Tertiary	80(74.1%)	107(64.1%)	16(41%)		
Number of Children <5 years					
One	68(63%)	71(43.3%)	16(41%)	17.030	0.009*
Two	36(33.3%)	71(43.3%)	21(53.8%)		
Three	4(3.7%)	20(12.2%)	2(5.1%)		
Four	0(0%)	2(1.2%)	0(0%)		
Husband's occupation					
Professionals					
Unemployed	16(14.8%)	18(10.8%)	5(12.8%)	36.742	0.013*
Civil/Public Servants	8(7.4%)	20(12%)	2(5.1%)		
Vocational Workers	39(36.1%)	56(33.5%)	5(12.8%)		
Military Personnel	1(0.9%)	4(2.4%)	2(5.1%)		
Driver	1(0.9%)	3(1.8%)	1(2.6%)		
Farmer	11(10.2%)	11(6.6%)	8(20.5%)		
Lecturer/Teacher	4(3.7%)	0(0%)	0(0%)		
Pastor	7(6.5%)	14(8.4%)	3(7.7%)		
Trader/Business	10.9%)	0(0%)	2(5.1%)		
	20(18.5%)	41(24.6%)	11(28.2%)		
Average monthly income					
<10,000	1(0.9%)	1(0.6%)	6(15.4%)	39.064	0.000*
10,000 – 50,000	37(34.3%)	78(46.7%)	15(38.5%)		
51,000 – 100,000	33(30.6%)	56(33.5%)	8(20.5%)		
>100,000	37(34.3%)	32(19.2%)	10(25.6%)		

*statistically significant

Table 6: Factors affecting Practices of Mothers of under five children on Diarrhea prevention and treatment in Nyaghasang community Cross River State. 2023

Variables	Good practice	Poor practice	Chi square	P-value
Age group of mothers				
<20	0(0%)	3(4.2%)	46.538	**0.000***
21-25	23(9.4%)	19(26.8%)		
26-30	105(43.4%)	31(43.7%)		
31-35	72(29.8%)	10(14.1%)		
36-40	29(12%)	5(7%)		
>40	13(5.4%)	3(4.2%)		
Educational level				
None	2(0.8%)	2(2.8%)	34.813	**0.000***
Primary	5(2.1%)	9(12.7%)		
Secondary	60(24.8%)	33(46.5%)		
Tertiary	175(72.3%)	27(38%)		
Religion				
Christianity	242(100%)	69(97.2%)	6.889	**0.032***
Islam	0(0%)	2(2.8%)		
Husband's occupation				
Professionals	29(12%)	10(14.1%)		
Unemployed	23(9.5%)	7(9.9%)	33.801	**0.028***
Civil/Public Servants	88(36.4%)	12(16.9%)		
Vocational Workers	4(1.7%)	3(4.2%)		
Trader/Business	53(21.9%)	19(26.8%)		
Place of delivery				
Nyagasang PHC	56(23.1%)	20(28.2%)	36.149	**0.003***
General Hospital	49(20.2%)	3(4.3%)		
UCTH	93(38.4%)	27(38%)		
Private Hospital	20(8.3%)	5(7%)		
Church	8(3.3%)	1(1.4%)		
Home	5(2.1%)	8(11.3%)		
Knowledge score				
Good	96(39.7%)	12(6.9%)		**0.000***
Fair	129(53.3%)	37(52.1%)	34.564	
Poor	17(7%)	22(31%)		
Place of ANC				
Nyagasang PHC	69(28.5%)	26(36.6%)	24.635	**0.017***
General Hospital	52(21.5%)	7(9.9%)		
UCTH	91(37.6%)	26(36.6%)		
Private Hospital	22(9.1%)	6(8.5%)		

*statistically significant

practices had a significant relationship (p = 0.000). There was also a significant relationship between religion of respondents and practices on diarrhea prevention and treatment (p = 0.032).

Discussion

This study was done to determine the knowledge and practices of mothers of under-five children on diarrhea prevention and treatment in Nyagasang, Atimbo, Calabar Municipal, Cross River State, Nigeria. The respondents in this study had fair knowledge but good practices towards diarrhea prevention and treatment.

In this study, the prevalence of children who have had at least an episode of diarrhea within the last 1 year among the 314 respondents interviewed was 167(53.2%). This is comparable to other studies done in similar settings[14,13] however, it contrast a national survey, where secondary data from the National demographic health survey was used where the reported diarrhea prevalence was12.9%.[15]

The study showed that only about a third of our study participants, (34.4%) had a good knowledge of diarrhea prevention and treatment this is comparable with a study done in Edo, South-South Nigeria, where 39.2% of mothers of under-five children were shown to have good knowledge on diarrhea prevention and treatment.16 and also with a study done in southern Nigeria on caregivers presenting at the diarrhea training unit of a tertiary hospital were 29.3% had a good level of knowledge[14] However, this contrast with studies which showed that majority of care-givers had good knowledge on diarrhea prevention and treatment. In a study done in Odukpani Local Government Area of Cross River, most nursing mothers (62.0%) were found to have good knowledge of diarrhea disease prevention and treatment.[17] This high knowledge score may be due to the fact that this study was done among nursing mothers who may still be attending immunization clinics and may have received recent health talks on diarrheal disease.

In a bid to ascertain the practices of mothers of under-five children on diarrhea prevention and treatment, this study showed result that majority (77.1%) of respondents had good practices on diarrhea prevention and treatment. This practice included the use of ORS (29.9%), exclusive breast feeding (70.7%), adherence to immunization schedule (79.3%) however, poor practices such as giving child over the counter medication (26.9%) and herbal

mixtures (9.2%) is still rampant. This is similar to a study in Kaduna where 34.4% of respondent used ORS for home management of diarrhea.[18]

From our study, several factors were shown to affected the diarrheal knowledge and practices of mothers of under five children. Mothers educational level, the number of children under five years, husbands' occupation and average income of the mothers were significantly associated with good knowledge of diarrheal disease and prevention in respondent. ($p<0.05$) Age of respondents, knowledge of diarrhea prevention, religion, place of ANC and delivery were statistically associated with practice of diarrhea prevention and treatment in study participants. ($p<0.05$). This is comparable to a study done in Lagos, Nigeria where age, and level of education were significantly associated with practice of diarrhea prevention among children under five years old and the researchers concluded that educated, employed, and married mothers were more likely to have good prevention practices towards diarrhea in their children under five years old.[19]

This has a policy implication for policy makers and stakeholders to improve the knowledge on diarrhea prevention and treatment among mothers of under-fives through health education, awareness campaigns and use of community role models/champions

Conclusion

Diarrhea is a leading cause of death in under-fives, hence knowledge of diarrhea and its risk factor, as well as preventive practices are essential in decreasing the mortality and morbidity due to the disease. This entails identification of the disease, the danger signs, predisposing factors, home management, and knowing when to seek expert medical management. It is important for caregivers to have the right knowledge of the disease and more importantly its preventive practices so as to effectively avert diarrheal disease and mitigate the debilitating effects if they do occur.

Our study showed that majority of respondents had fair knowledge and good practice of diarrhea preventive measures, this inadvertently exposes the under-five children to debilitating effects of diarrhea so this holds implication for policy makers and stakeholders to improve knowledge of diarrhea and its preventive practices among care-givers of under-fives.

Conflicts of interests

The authors declared they have no conflicts of interest.

Authors' contributions

NOE, AII, DCN, ME, AUU, DSU, and ABF conceived, designed, and implemented the study. NOE and AII guided and supervised design and implementation and also wrote the first draft of the manuscript. All authors reviewed and edited the manuscript and approved the final version of the manuscript.

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