

FOOD HYGIENE PRACTICES OF MOTHERS OF UNDER-FIVES AND PREVALENCE OF DIARRHOEA IN THEIR CHILDREN IN OGHARA, DELTA STATE

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ABSTRACT

Diarrhoea remains one of the major public health problems in developing countries. The objective of this study was to investigate potential factors of food hygiene practices of mothers in the home on the prevalence of diarrhoea among under five children in Edjemuonyavwe community, Oghara, Delta State. This descriptive cross sectional study was carried out among 495 mothers with children aged 6-59 months in a rural community of southern Nigeria. Selection of participants was by multistage sampling technique. Tool for data collection was interviewer administered semi structured questionnaire which sought information on age, occupation and educational status of the mother; history of diarrhoea in the child and food hygiene practices of the mother. Data was analysed using SPSS version 13 statistical soft ware. The prevalence of diarrhoea among the under fives was 43.4%. The rate of diarrhoea was higher among children of mothers who prepared child's food on the floor (45.5 %) than those who prepared it on the table (40.7 %), and those who used only water for hand washing (48.2 %) than those who used soap and water (40.3 %). There was no relationship between the prevalence of diarrhoea and the mothers' age. The rate of diarrhoea decreased with increasing order of the child's position in the family ($p=0.19$). Although not statistically significant, there was an association between the prevalence of diarrhoea and mothers' educational level ($p=0.49$) and occupation ($p=0.10$). The prevalence of diarrhoea was considerably high among the under fives. Mothers' food hygiene habit was associated with the development of diarrhoea among their underfives. Health educations on diarrhoea and food hygiene practices need to be intensified at the community level to improve mothers' food hygienic practices.

INTRODUCTION

Hygiene means practices that prevent the spread of disease-causing organisms.¹ It is a procedure or system of procedures or activities used to reduce microbial contamination

on environmental sites and surfaces in order to prevent the transmission of infectious disease.² Hygiene can be viewed as personal hygiene, environmental hygiene and food hygiene.³ WHO/FAO defined food hygiene and safety as 'all conditions and measures that are necessary during the production, processing, storage, distribution and preparation of food to ensure that it is safe, sound, wholesome and fit for human consumption'.^{4,5} Several diseases and health-related states are associated with poor hygiene. These include skin diseases such as ringworm and scabies, helminthes infestations such as round worms and whip worm, and diarrhea diseases. Of all the diseases mentioned, diarrhoeal diseases

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remain a leading cause of preventable death, especially among children under five years old in developing countries^{6,7}. Diarrhoea is recognized as one of the childhood killer diseases. Worldwide, it accounts for 24% of the causes of under-five morbidity and 15% of under-five mortality^{6,8}. Therefore, the prevention of diarrhea is a major public health challenge in these countries. Diarrhoeal diseases account for 4.3% of the total global disease burden (62.5 million disability adjusted life years)⁶. An estimated 88% of this burden is attributable to unsafe drinking water supply, inadequate sanitation, and poor hygiene^{6,8}. A study was carried to determine the food hygiene practices of food vendors in secondary schools in Ilorin, Nigeria. The result revealed that the major unhygienic practices among the food vendors were poor care of used utensils (54%), lack of hand wash basin for immediate cleaning (33%), and only 46% used soap and water to clean feeding utensils¹⁰. Another study examined diarrhoeal morbidity and associated risk factors in children under five years of age in Jos University Teaching Hospital¹¹. This study showed a relationship between the development of diarrhoea and mothers' educational status, family type, breastfeeding, and sex of the child. In Nigeria, diarrhea morbidity among the under-five age group was 4.1-6.7 episodes per child per year in 1983 and 2.5-2.9 in 1986.6 Diarrhoea is defined as passage of three or more loose or watery stools in a 24-hour period⁹. It is caused by organisms that are spread by faeco-oral route through contaminated food and water. Three major groups of organisms that cause diarrhoea in childhood are: bacteria, viruses and protozoa^{6,9}. The bacteria include shigella, salmonella, Escherichia coli, Yersinia enterocolita, Vibrio cholerae, Staphylococcus aureus and Clostridium perfringens. The viruses include Rota virus,

Norwalk virus and corona-like virus. The protozoa comprise of Giardia lamblia and cryptosporidium^{6,9}. The most widely reported cause of life threatening diarrhea in children under 2 years, worldwide, is rotavirus^{7,8,12}. Major epidemics in Asia, the Eastern Mediterranean, Central America and Africa, with high morbidity and mortality have been caused by Vibrio cholera and shigella dysenteriae^{7,8}. In Nigeria, viruses are the major cause of diarrhea in up to 60% of cases and bacterial organism account for only 10% of diarrhoeal cases^{9,13}. Factors predisposing children to diarrhea include poor hygiene, poverty, lack of sufficient clean water, contaminated food supplies, overcrowding especially in the rural slums, illiteracy, ignorance, measles, immunosuppression and malnutrition^{2,6}. Several studies in developing countries have shown that increase in diarrhoeal diseases in under five children is related to the decline in breast feeding, the tendency to pick things and put in the mouth especially during teething, poor weaning practices, and the increasing trend toward bottle feeding^{7,13,14}.

A child is regarded by society, as a person of lower level of maturity, needing adult protection, love and nurturing. It is therefore expected that the health care of a child be the responsibility of an adult. In our society, a mother is assigned a major responsibility in child care, therefore, most care givers are mothers. Some of her skills appear to impact on the child's health outcome^{7,15}. The degree of vulnerability perceived by care giver will affect their perception of the severity and threat of their child's illness and the pattern of health care use^{14,15}. Some variables noted to be important predictors of the outcome of childhood diarrhoea include: knowledge of cause of diarrhea, where to and how to treat diarrhea, housing quality, mothers' age, education and civil status, type of water service, mother's perception of malnutrition

in the child, age of mother, house appearance, birth place of mother and mother's general knowledge of diarrhea.^{13,15,16}

Although the World Health Organization (WHO) outlined basic principles for the preparation of safe food for infants and young children⁴, little has been reported on the effect of food hygiene practices of mothers on diarrhoea among children in Nigeria. The data will be useful to develop guidelines fit for local setting and to encourage mothers to change their practices for preventing diarrhoea among children.

The aim of this study was to: determine the prevalence of diarrhoea in children 6-59 months; describe and classify the hygienic practices of mothers; and relate the hygienic practices of mothers to the prevalence of diarrhoea in their children.

METHODOLOGY

This study was carried out in Edjemuoyavwe, a rural community in Oghara clan of Ethiope West Local Government Area (LGA) of Delta State. Oghara is the largest community in Ethiope west LGA and is made up of 2 clans- Oghara-efe and Oghara-eki. Edjemuoyavwe is one of the 5 communities in Oghara-efe, the others are Ovade, Ijomi, Otefe and Adjagbovev. Oghara covers an area of 1175Km², with an estimated population of about 121627 people¹⁷. The major occupation of inhabitants of Oghara is farming and trading. Delta State University Teaching Hospital (DELSUTH) is located within Oghara community. This study was conducted in May 2011.

The study population was women who had children from 6-59 months of age. The minimum sample size for this study, 384, was calculated using the formula for simple proportion. This number was increased to 500 to overcome any error that may arise from non-response. However only 495 were

correctly filled and used for this study.

A descriptive cross-sectional study was carried out. A multistage sampling technique was used to select participants. First, systematic sampling technique was used to select 100 houses in the community. All the households in the 100 houses were identified and listed and used as sampling frame. Random sampling technique was then used to select mothers with children aged between 6 – 59 months from the 100 houses. Where the mother had more than one under five, the youngest was selected. Children aged 0-5 months were assumed to be on exclusive breastfeeding and their mothers were not part of this study.

A semi structured researcher administered questionnaire was used to collect information from respondents. The questionnaire sought information on mothers' age, educational status, occupation and hygienic practices in relation to the child's food preparation, and the child's age and position among the mothers' children. Also the history of diarrhoea from the child in 3 months preceding the study was sought.

Data was retrieved and analysed using an SPSS version 13.0 statistical software. The level of statistical significance was set at $p < 0.05$.

Ethical approval to carry out this research was obtained from the Health Research Ethics Committee of Delta State University Teaching Hospital, Oghara.

Community entry was through the village head where permission was sought from him to enter the community to collect data. The purpose of the study was also explained to individual subjects and verbal consent was obtained from them.

RESULTS

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF MOTHERS (n=495)

VARIABLE	FREQUENCY	PERCENT
Age group (years)		
15-19	33	6.7
20-24	131	26.5
25-29	151	30.5
30-34	93	18.8
35-39	55	11.1
40-44	24	4.8
45-49	8	1.6
Educational level		
Nil	26	5.3
Primary	352	71.1
Secondary	92	19.4
Tertiary	21	4.2
Occupational status		
Traders	172	34.8
Farmers	120	24.2
Artisans	93	18.8
House wife	61	12.3
Students	17	3.4
Teachers	12	2.4

TABLE 2: MOTHERS' SOURCE OF WATER AND SANITARY FACILITIES (n=495)

VARIABLE	FREQUENCY	PERCENT
House hold source of drinking water		
Bore hole	370	74.7
Well	160	32.3
Rain	48	9.7
Water board tap	34	6.9
Type of toilet		
Bush	176	35.6
Water system	159	32.1
Pit latrine	93	18.8
Ventilated improved pit	58	11.7

TABLE 3: PREVALENCE OF DIARRHOEA BY HYGIENIC PRACTICE OF MOTHERS

HYGIENIC PRACTICE OF MOTHERS	History of Diarrhoea among children			
	YES (%)	NO (%)	TOTAL (%)	
Where food is prepared				
On the table	88 (40.7)	128(59.3)	216(100.0)	X ² =1.13; df=1; P=0.29
On the floor	127(45.5)	152(54.5)	279(100.0)	
Type of hand washing				
Water only	95 (48.2)	102 (51.8)	197 (100.0)	X ² =3.08; df=1; P=0.08
Soap and water	120(40.3)	178 (59.7)	298 (100.0)	
How long it takes child to feed after food is prepared				
Within 3 hours	152 (43.8)	196 (56.2)	348 (100.0)	X ² =0.03; df=1; P=0.87
After 3 hours	63 (58.1)	84 (41.9)	147 (100.0)	
Frequency of hand washing				
Always	114 (43.8)	146(56.2)	260 (100.0)	X ² =0.04; df=1; P=0.85
Sometimes/Rarely	101 (43.0)	134 (57.0)	235 (100.0)	

TABLE 4: PREVALENCE OF DIARRHOEA BY MOTHERS' AGE, EDUCATIONAL STATUS AND OCCUPATION

CHARACTERISTICS	No. of children with history of diarrhea (% History of diarrhea)	No. without history of diarrhea (% Nil history of diarrhea)	Total population (%)
Mothers' Age			
Mothers' Group (years)			
15-19	15 (45.5)	18 (54.5)	33 (100.0)
20-24	62 (50.4)	69 (52.6)	131(100.0)
25-29	62 (41.1)	89 (58.9)	151(100.0)
30-34	38 (40.9)	55 (59.1)	93(100.0)
35-39	23 (41.8)	32 (58.2)	55(100.0)
40-44	12(50.0)	12(50.0)	24(100.0)
45-49	3 (37.5)	5 (62.5)	8(100.0)
Mothers' Educational Status			
Nil	12 (46.2)	14 (53.8)	26 (100.0)
Primary	152(43.2)	200 (56.8)	352 (100.0)
Secondary	45 (46.9)	51 (53.1)	96 (100.0)
Tertiary	6 (28.6)	15 (71.4)	21 (100.0)
X ² =2.44	df=3	P=0.49	
Mothers' Occupation			
Trader	69(40.1)	103 (59.9)	172 (100.0)
Farmer	62(51.7)	58(48.3)	120 (100.0)
Artisan	32 (34.4)	61 (65.6)	93 (100.0)
Housewife	32 (52.5)	29 (47.5)	61 (100.0)
Students	8 (47.1)	9 (52.9)	17 (100.0)
Civil servant	6 (46.2)	7 (53.8)	13 (100.0)
Teacher	3 (25.0)	9 (75.0)	12 (100.0)
Apprentice	3 (42.9)	4 (57.1)	7 (100.0)
X ² =10.40;	df=6;	P=0.10	

TABLE 5: PREVALENCE OF DIARRHOEA BY CHILDS' AGE AND POSITION IN FAMILY

CHARACTERISTICS	No. of children with history of diarrhoea (% History of diarrhea)	No. without history of diarrhea (% Nil history of diarrhea)	Total population (%)
Child's age (month)			
6-12	97 (55.7)	77 (44.3)	174 (100.0)
13-24	58 (47.2)	65 (52.8)	123(100.0)
25-36	34 (34.3)	65 (65.7)	99(100.0)
37-48	16 (25.8)	46 (74.2)	62(100.0)
49-59	10 (27.0)	27 (73.0)	37(100.0)
X ² =26.6;	df=4;	P=0.00	
Child's position in the family			
1 st	57 (52.3)	52(47.7)	109(100.0)
2 nd	54(45.4)	65(54.6)	119(100.0)
3 rd	41(41.8)	57(58.2)	98(100.0)
4 th	28(41.8)	39(58.2)	67(100.0)
5 th	19(33.9)	37(66.1)	56(100.0)
≥6 th	16(34.8)	30(65.2)	46(100.0)
X ² =7.38;	df=5;	P=0.19	

RESULTS

Four hundred and ninety five mothers aged 15-49 years participated in this study. The sociodemographic characteristics of the mothers are shown on table 1. Most of the mothers 30.5% (151) were between 25-29 years, followed by 20-24 years (26.5%). The highest educational level attained by 352 (71.1%) of the mothers was primary school education. The 2 most common occupations were trading (34.8%) and farming (24.2%). The age range of the children was between 6 – 59 months with a mean of 25.7 ± 16.2 months. Out of 495 mothers that participated in the study, 215 admitted that their index child had suffered from diarrhoea three months prior to the study, giving a prevalence rate of 43.4%. Comparatively, among the 215 children with history of diarrhea, 45.1% (97), 27.0% (58) and 27.9% (60) were 6-12 months, 13-24 months and 25-59 months respectively. This relationship was statistically significant ($p=0.00$).

The major source of drinking water for household members was bore hole (74.7% or 370) while the least was tap water from the water board (6.9% or 34) (table 2). The predominant type of toilet used by respondents was the bush system 35.6% (176), followed by the water system variety 32.1% (159).

An analysis of hygienic practices of mothers in relation to prevalence of diarrhoea in the children is presented in table 3. In this study, hygienic practices considered to be good included: preparing child's food on the table, washing hands with soap and water, always washing the hands in between meals, and feeding child with food within 3 hours of food preparation. Hygienic practices considered poor or not satisfactory were: preparing child's food on the floor, washing hands with only water, feeding child with feeds which has lasted more than 3 hours

after preparation, and occasional washing of hands in between child's food preparation. The types and proportions of food hygiene practices of mothers reported were: preparing child's food on the table, 216 (43.6 %), washing hands with soap and water, 298(60.2 %), feeding child with food within 3 hours of preparation, 348(70.3 %), and washing hands always, 260 (52.5 %). The good hygienic practice with highest proportion was, feeding child within 3 hours of food preparation, 70.3%, while the least proportion was, preparing child's food on the table (216 or 43.6%). Comparatively, the prevalence of diarrhoea was higher among children whose foods were prepared on the floor (45.5%) than those prepared on the table (40.7%). Also, children whose mothers used only water for hand washing had a higher prevalence of diarrhoea (48.2%) than those whose mothers used both soap and water (40.3%). The prevalence of diarrhoea among children whose mothers washed their hands always was 43.8%, whereas the prevalence was 40.3% for children whose mothers washed their hands only occasionally (40.3%), and this difference was not statistically significant($p=0.85$)

Table 4 shows the prevalence of diarrhea by mothers' age, educational status and occupation. There was no association between the prevalence of diarrhoea among the children and the age of their mother. The highest rate of diarrhoea was reported among children whose mothers were 20-24 years (50.4%) and lowest in those 45-49 years (37.5%). Over all, the prevalence of diarrhoea among the children decreased with increased level of education of their mothers. The prevalence of diarrhoea was 46.2% among children whose mothers had no formal education compared to 28.6% for children whose mothers attained tertiary level of education. An analysis of diarrhoea in relation to occupation of mothers showed

that, the highest proportion of diarrhoea was observed in children whose mothers were housewives (52.5%), while the lowest percent was among children whose mothers were teachers (25.0%).

In table 5, the prevalence of diarrhea significantly reduced with increasing age of the children from 55.7% in those of age 6-12 months to 25.8% in those of 37-48 months of age ($p=0.00$). The highest proportion of children who had history of diarrhea was recorded among children who were 1st child of the mother, and this gradually reduced to a prevalence of 34.8% among children who were at least the 6th child of their mothers.

DISCUSSION

The year 2015 which is targeted for the achievement of Millennium Development Goals (MDG) is fast approaching, yet diarrhoea diseases remain a significant problem among children. This study has revealed a high prevalence (43.4%) of diarrhoea infection among the under fives in this community and is an indication of the severity of diarrhoea in the community which is quite worrisome. The reason may be attributable to poor water supply and waste disposal in the community as only 6.9% have access to potable water supply (tap water) and less than half use sanitary method of excreta disposal (VIP toilet and water system).

Various studies have identified infancy as the period of life with highest incidence of diarrhoea among the under fives^{6,8,9}. This report agrees with this study where those aged 6-12 months had the highest prevalence rate of diarrhoea compared to other age groups. A number reason can explain this. It is at 6 months that exclusive breastfeeding stops. Exclusive breastfeeding in infancy is known to protect against diarrhoea with maternally acquired antibodies helping to fight infective agents responsible for the disease. However, at this stage, there is a

general decline in these antibodies and more so in those not exclusively breastfed, and hence the high risk of developing diarrhoea. Besides, complementary feeds are usually introduced at this stage (which may be contaminated) with an attendant increase risk of developing diarrhoea. It should be noted that, as the child grows older the immunity also improves making the child relatively more resistant to infection. Also, as the child grows older, the rate of mouthing of objects reduce thereby reducing the contact with infective agents which subsequently reduce the dose of infective agents and reduce the development of diarrhoea.

A reasonably large number (56.4% or 279) of mothers prepared their children food on the ground, while about 29.7% allowed several hours (>3hours) to elapse between food preparation and child consumption of the food. These two practices are major factors predisposing to food contamination and food poisoning.

According to the WHO basic principle for food hygiene and safety, the longer prepared food stays (>3hours) within ambient temperature, the more favourable the environment is for multiplication of foodborne pathogens^{3,4}. This in turn leads to high rate of infectivity. This may have accounted for the higher rate of diarrhoea (58.1%) in children whose prepared food was kept longer than 3 hours before consumption than those (43.8%) kept for at most 3 hours.

The observation that 279 (56.4%) of the mothers prepare their babies food on the floor, and 235(47.5%) of the mothers occasionally wash their hands in between babies food preparation reflects a remarkable level of poor hygiene and calls for intensive food hygiene education for the mothers. In this study, children who had their food prepared on the floor had a higher risk of diarrhoea (45.5%) than those whose food

was prepared on the table (40.7 %). This result is comparable with that from Myanmar, where eating food that had been placed on the floor was significantly associated with persistent diarrhoea.¹⁸

In this study, the highest rate of diarrhoea was recorded among children of mothers who were housewives while the lowest was among children whose mothers were teachers. The teachers appear to be the most learned among other occupations highlighted. This low rate of diarrhoea among the teachers may be due to their high educational status and better knowledge compared to other occupations. Educated mothers are more exposed to the importance of hygiene, better childcare and feeding practices, and are more aware of disease causation factors and preventive measures.^{15,18} In addition, this result is comparable to another where parents' education had a correlation with diarrhoeal diseases.¹¹ In that study, the rates were significantly lower among children of higher educated parents compared with those of less educated parents.

The prevalence of 43.4% obtained in this study is greater than 21.6% and 2.6% obtained from studies at Irepodun¹⁹ and Jos¹¹ in Nigeria respectively. The difference may be due to varying duration for which the prevalence was calculated for. For example, in the Irepodun study the history of diarrhoea was demanded for the period two weeks before the study, while that in the current study was taken from three months prior to the study.

It was surprising to note that the prevalence of diarrhoea was higher among children whose mothers frequently washed their hands (43.8%) than those whose mothers washed their hands occasionally (43.0 %) in between baby's meal preparation. This result

probably suggests that the frequency of hand washing may not be a major determinant of diarrhoea among children in this community.

CONCLUSION

Diarrhoea is an important health problem in this community as almost half of the children admitted to have experienced it at the study period. A remarkable proportion of the mothers had poor food hygiene habit, the worst being preparing the child's food on the floor. There was relationship between mother's hygiene practices and the development of diarrhoea in their children. However, there was no relationship between the mother's age and the development of diarrhoea in their children. Increasing the frequency of handwashing did not decrease the rate of diarrhoea. The study showed that maternal education has a positive effect on diarrhoea morbidity.

RECOMMENDATION

Health educations on diarrhoea and food hygiene practices need to be intensified at the community level to improve mothers' food hygienic practices.

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