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Influence of Environmental Factors and Socioeconomic Status of Parents on the Occurrence of Under-Five Diarrhea Disease Among Selected Households in Abia State, Nigeria

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Abstract: Diarrhea diseases are widely recognized as a major cause of childhood morbidity and mortality in many developing countries in children under five years of age. This study examined the influences of socioeconomic status of parents and environmental factors on the occurrence of under five diarrhea disease among selected households in Abia State. Six (6) L.G.A were randomly sampled and 3,000 households were selected for the study through multistage sampling technique. A well structured questionnaire was use to collect relevant data regarding respondent socio-demographic characteristics, knowledge of diarrhea disease, sign and symptoms, causes of diarrhea, Child's exposure to diarrhea within the past three months as well as the environmental factors of diarrhea. Data collected were analyzed using percentage and chi-square (x^2). Almost all the respondents (99.3%) claimed to have knowledge of diarrhea disease. The main source of information/awareness was the health center (26.7%), while the least was newspaper/magazine, (2.5%). Frequent watery stool was the common sign/symptom while contaminated food (7.7%) and bad water (4.8%) were the common causes of diarrhea. About 74.8% of the respondent attested that they have experienced diarrhea on their children less than five years with the major occurrence within 0-10months (26.8%), more especially among the boys (52.3%). Contaminated water and food (23.3%) and dirty and bushy surroundings (21.0%) were the major environmental factors associated with diarrhea occurrence. Financial status of caregivers/parents, low educational level and inadequate knowledge about diarrhea, as well as some environmental factors like contaminated water and food, dusty and bushy surrounding, poor toilet facility, improper refuse disposal and animals sheltered in household were found to significantly influence the occurrence of diarrhea disease among under-five children. Conclusively, it was recommended that the households including mothers must be well informed about the importance of employing good hygiene practices, the importance of using good hygiene practices regarding water, sanitation and food preparation to reduce/control diarrhea diseases. Furthermore, health intervention programs, to include exclusive breastfeeding and maternal hygiene education should be strengthened in order to reduce the morbidity and mortality of diarrhea disease.

Keywords: Influence, Environmental Factors, Socioeconomic Status, Parents/Caregivers, Diarrhea, Under-Five, Household

1. Introduction

Diarrhea is the passage of three or more loose or watery stool within 24 hours, a loose stool being one that would take the shape of the container (Adimora, Ikefuna and Ilechukwu, 2011). When associated with passage of blood in the stool, this is referred to as dysentery. Navaneethan and Giannella, (2008) opined that the foremost cause of diarrhea leading to death and morbidity worldwide in childhood is rotavirus infection. It is only second to pneumonia as a killer disease in childhood. Before the age of 5years, practically every child

in Africa environment has had at least one episode of childhood diarrhea with some having up to three episodes per year (Adimora et al, 2011). WHO (2003) reports noted that diarrhea disease is the second leading cause of death in children under five years old and is responsible for killing 760,000 children every year. Most people who die from diarrhea actually die from dehydration and fluid loss.

Education is a vital tool in enlightening mothers and also changing their healthcare seeking behavior and practice as noted by Yilgwan and Okolo, (2012). This knowledge is said to affect their behavior, especially as it relates to child rearing practices and healthcare. Bethany, Rob and Juan (2008) emphasized that child diarrhea needs to be understood through the mother because a child's world is predominantly controlled by and experienced through the mother. Yohannes, Streatfield and Bost, (1999) in their study indicated that the prevalence of diarrhea varies according to education of mother, being significantly lower among children of more educated mothers than among children of mothers with no education. Yilgwan et al, (2012) also reported that 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.

Similarly, diarrhea disease according to Kare, Henrik, Liselotte and Peter, (1997) remains a major cause of child morbidity and mortality in low income societies. Fuchs, Sultana, Ahmed, and Hossain, (2014) opted that one of every five children aged less than 5 years in low-income developing countries is malnourished. It is well documented that poverty and malnutrition regardless of location are highly intertwined. In their study, Fuchs et al, (2014) reported that the fathers of most 84% of the wasted children were rickshaw pullers or day laborers. Income insecurity leads to food insecurity, forcing family members to consume poor food quality and/or amount. Ahmed, Ahmed, Roy, Alam and Hossain, (2012) and Nahar, Ahmed, Roy, Alam, and Hossain, (2012) also emphasized that low family income is a possible risk factors of acute malnutrition in wasted children under 2 years old, and on severely underweight under five children in Bangladesh.

Diarrhea incidence according to Rina, Tirta, Soemilah, Ingebora, Bovee, Edith, and Frans, (2013) remains a tremendous burden in children in low and middle income countries due to multiple determinants such as child malnutrition, low socioeconomic status and education of mothers, lack of safe drinking water, inadequate sanitation and poor hygiene, crowding and low maternal age. Environmental Health Project (2012), identified a number of environmental factors such as lack of safe water, inadequate excreta disposal facilities, poor hygiene, poor living conditions and unsafe food as accounting for as much as 88% 0f the disease burden due to diarrhea. While poor hygiene practices, especially in food preparation and feeding practices may increase the risk of having diarrhea, up to 70% of diarrhea episodes are actually caused by water and food contaminated with pathogens (Motarjemi, Kaferstein, Moy, and Quevedo, 1993). Lack of access to a toilet facility is associated with a high incidence of diarrhea as noted by Boadi and Kuitunen, (2005). Levine and Levine, (1991) and Boadi et al, (2005) emphasized that public latrines are generally unhygienic and unhealthy for children due to the presence of flies and dirty floors which promote infections such as cholera, shigella, salmonella and rotavirus all of which have been shown to be major causes of diarrhea in children. Oloruntoba, Folarin and Ayede, (2014) and Akimbami, (2007) also revealed that poor drinking water handling and storage within household, hand washing without soap before food preparation and after defecation are major risk factors for diarrhea among children less than five years. Inadequate sanitation factors such as presence of clogged drainage near/around the house and breeding places for flies/insects near the house increases the risk of diarrhea among children less than five years.

Furthermore, Fening and Edoh, (2008), stressed that the relationship between socioeconomic status and health indicators has been widely studied and it's recognized as a cause-effect relationship and access to social services such as education, housing, food, portable water as well as equitable income distribution are important determinants of individual health conditions. Bethany et al, (2008) in their study indicated that maternal access to care and maternal agency influences the likelihood of a child getting diarrhea. However, this study was limited in scope to mother as it did not extend to other members of the household where the men are the head of household and mothers are either absent or deceased. Therefore the implication of not having a mother was not considered. According to Kare et al, (1997) several studies have investigated risk factors for childhood diarrhea, a major cause of mortality among childhood in less developed countries. These studies have in particular addressed domestic and environmental factors, including water and sanitation, or factors to the mother's hygiene practices and knowledge. Although well designed case control studies may relatively assess the risk for incident cases, there are inherent methodological problems in the collection of exposure data and selection of controls. Iloh, Ofoedi, Njoku, Amadi, and Godswill-Uko, (2012) opined that it has been generalized that about 70% of the under-five Nigeria children reside in the rural areas of the country. Similarly, rural residence has also been described as one of the risk factors for under-five morbidity and mortality. Due to the global increase in diarrhea disease among under-five children especially in the rural communities, the researcher decided to research on the possible factors that may be responsible for such phenomenon. Considering the information above, this study sought to: ascertain the general knowledge of under five diarrhea diseases among parents/caregivers in households in Abia state; determine the influence of educational level of parents/caregivers on the distribution of Under Five diarrhea diseases among households; find out the influence of financial strength of parents on the distribution of under five diarrhea diseases among households and also determine the influence of environmental factors on the distribution of under five

diarrhea diseases among households in Abia state, Nigeria.

2. Methodology

The researcher employed the survey method of research design for a baseline study of this nature. The setting of this study is Abia State, which was created in 1991 Hoiberg and Dale, (2010). Geographically, Abia State is bounded on the north and northeast by states of Anambra, Enugu and Ebonyi; to the west with Imo state; to the east and southeast are Cross Rivers and Akwa Ibom states and to the South is Rivers state. Abia state has Seventeen Local Government Area (L.G.A).

The provisional population of Abia state was projected at 1,976,805 out of which 920,268 are males and 956,434 are female. The study population involved parents/caregivers in selected household in Abia state. A Multistage sampling was used. At first stage, simple random sample was used to select 6 L.G.A. by ballot without replacement. The next stage was Stratified systematic sampling method. A random start of 5 was used in selecting the households used for collecting data. A minimum sample size of 3,000 households drawn from the 6 L.G.A was therefore considered adequate for the study. Every parent/caregiver of selected household that was present on the day of interview for particular L.G.A was interviewed using equal allocations.

A self-structured and validated questionnaire based on the set objectives with 15 test items formed the major instrument for the study. The instrument was subjected to a test-retest reliability exercise in another L.G.A that was not part of the study. A reliability co-efficient of correlation of r = 0.81 was achieved. The administration of the instrument lasted for 6 months and data was manually tallied and analyzed in frequency, percentages and Chi-square.

3. Result

Table 1 showed the socio-demographic characteristics of the respondents. Age group 31-40 years was the highest among the respondents (54.7 percent) with 69.0 percent been female and 31.0 percent were males. Married respondents were the highest, 85.0 percent while majority were Christian, 72.2 percent. In educational level, those that had secondary education was the highest (48.3 percent) followed by those that had Tertiary education (47.2 percent). Trading was their main occupation (20.3 percent) followed by business tycoon (18.2 percent), while 17.2 percent were housewives. The result also indicated that 30.5 percent respondents lived on average monthly income of 50,000-99,000 Naira followed by those that earn 18,000-29,000 Naira monthly, 20.0 percent. In terms of number of children in the household, 370 respondents had 3-4 children in a house (61.7 percent) while 476 respondents had 1-2 children less than five years old (79.3 percent) in a household. Majority, 36.7 percent area of residence was flats, while school was the common available social amenities with potable water supply been the least (2.7 percent).

Table 1. *Socio-Demographic Characteristics of the Respondents.*

Socio-demographic characteristics	Frequency (N=3,000)	Percentage (%)
Age group (years)		
20-30	915	30.5
31-40	1640	54.7
41-50	320	10.7
51-60	125	4.2
Gender		
Male	930	31.0
Female	2070	69.0
Marital Status		
Single	5	.2
Married	2550	85.0
Separated/Divorced	445	14.8
Religion		
Christian	2165	72.2
Moslem	65	2.2
Traditional/pagan	65	2.2
None	705	23.5
Educational Level		
No Formal education	70	2.3
Primary school	65	2.2
Secondary school	1450	48.3
Tertiary	1415	47.2
Occupation		
Housewife	515	17.2
Artisan	205	6.8
Farmer	195	6.5
Trader	610	20.3
Business tycoon	545	18.2
Civil servant	470	15.7
Professional	460	15.3
Average Monthly Income		
<18,000	425	14.2
18,000-29,000	600	20.0
30,000-49,0000	520	17.3
50,000-99,000	915	30.5
100,000 and above	540	18.0
No. of children in the house		
1-2	570	19.0
3-4	1850	61.7
5-6	455	15.2
9-10	125	4.2
No. of children less than 5 years old		
1-2	2380	79.3
3-4	495	16.5
5	125	4.2
Location/Area of Residence		
Face me, I face you	355	11.8
Flats	1100	36.7
Slum	520	17.3
GRA	305	10.2
Private resident	720	24.0
Availability of social Amenities		
School	680	22.7
Health facility	335	11.2
Electricity	90	3.0
Potable water supply	80	2.7
Others	1815	60.5

Table 2 showed the knowledge of under five diarrhea diseases among households. Majority, 99.3 percent claimed to know what is diarrhea. Health centers (26.7 percent) were the common place of information/awareness about diarrhea while newspapers/magazine (2.5 percent) was the least. It was indicated that frequent watery stool (21.7 percent) was

the highest sign for identification of diarrhea, and also, contaminated food (7.7 percent) was the major cause of diarrhea followed by bad water (4.8 percent). 74.8 percent attested that they had experienced diarrhea in their children less than 5 years, with the highest occurrence between the age ranges of 0-10 months (26.8 percent) and the girl child experiencing the highest (52.3 percent) diarrhea occurrence.

Furthermore, it was indicated that contaminated water and food (23.3 percent) was the major environmental factor associated with diarrhea occurrence followed by dirty and bushy surrounding (21.0 percent) while animals sheltered in household (11.0 percent) was the least environmental factor for the distribution of diarrhea disease.

Table 2. *Knowledge of Under-Five Diarrhea Diseases Among Selected Households.*

Questions	Frequency (N=3,000)	Percentage (%)
Do you know what is Diarrhea?		
Yes	2980	99.3
No	20	0.7
Where did you first hear of it?		
Hospital	355	11.8
Health centers	800	26.7
Television	265	8.8
Radio	335	11.2
Newspapers/magazine	75	2.5
Others	1170	39.0
How can you identify diarrhea?		
Frequent watery stool	50	21.7
Frequent non-watery stool	15	0.5
Bloody stool	75	2.5
Greenish stool	65	2.2
Mucoid stool	140	4.7
Others	2055	68.5
What do you think causes diarrhea?		
Bad water	145	4.8
Teething	70	2.3
Contaminated food	230	7.7
Dirty/soiled hand	75	2.5
Sugary food	70	2.3
Normal development	80	2.7
Others	2330	77.7
Have you experienced diarrhea in any		
Of your children less than 5 years?		
Yes	2245	74.8
No	755	25.2
If yes, what is the age of the child In months?		
0-10	805	26.8
11-20	405	13.5
21-30	610	20.3
31-40	590	19.7
41-50	465	15.5
51-60	125	4.2
Sex of the child		
Boy	1430	47.7
Girl	1570	52.3
Environmental Factors		
Dirty and bushy surroundings	630	21.0
Contaminated water and food	700	23.3
Poor toilet facility	625	20.8
Improper refuse disposal	605	20.2
Animals sheltered in household	330	11.0
Others	110	3.7

Table 3 showed that the result of the respondents on the knowledge of under-five diarrhea diseases and its occurrence among households in Abia State. Majority, 74.6 percent claimed to have knowledge of what diarrhea was. The analysis of data using Chi-square (x^2) statistic revealed that the knowledge of under-five diarrhea diseases among households do not significantly influence its occurrence in Abia State. (Chi-square = 1.354, p-value = 0.245).

Table 4 showed the response of the study participants on the educational levels of parents and its influence on the distribution of under-five diarrhea diseases among households in Abia State. From the Table, those who attained secondary (85.5 percent) and tertiary education (66.1 percent) experience diarrhea disease more in children less than 5 years old when compared with those with lesser educational qualifications. Analysis of the data further

revered that the educational levels of parents significantly influence the distribution of under-five diarrhea diseases among households in Abia State (Chi-square =72.460, p. value < 0.001).

Table 5 showed the financial strength of parents and its influence on the distribution of under-five diarrhea diseases among households in Abia State. Those whose average monthly income was between 30,000-49,000 Naira (57.5 percent) attested that they experience diarrhea disease more in their under-five children. This was followed by those whose average monthly income was between 50,000-99,000 Naira (85.8 percent). Meanwhile those whose average monthly income was less than 18,000 Naira (50.6 percent) conceded that they experience diarrhea disease less in their under five children. Analysis of the date revealed that the financial strength of parents significantly influence the distribution of under-five diarrhea diseases among households in Abia State. (Chi-square -58.073, P- Value <0.001).

Table 6 showed the environmental factors and its influence on the distribution of under-five diarrhea disease among households in Abia State. Improper refuse disposal (82.6 percent) was the major environmental factor associated with the distribution of diarrhea disease among under five children followed by contaminated water and food (80.7 percent). The result also indicated that poor toilet facility (76.8 percent) influence the distribution of diarrhea disease among under five children, while the least acclaimed factor was dirty and bushy surrounding (61.9 percent). Furthermore analysis of the data using Chi-square (x^2) statistic revealed that the environmental factors significantly influence the distribution of under five diarrhea disease among households in Abia State (Chi-square = 19.501, P-value = 0.002).

Table 3. *Knowledge of Under-Five Diarrhea Disease among Selected Households and Its Influence in the Occurrence in Abia State.*

Have you experienced diarrhea in any of your Children less than 5 years			
Do you know what diarrhea is?	**Yes**	**No**	**Total**
Yes	2225 74.6%	755 25.3%	2980
No	20 100.0%	0 .0%	20
Total	2245 74.8%	755 25.2%	3000

Chi-square = 1.354, df = 1, p-value = 0.245.

Table 4. *Educational levels of Parents and its Influence in the Distribution of Under-five Diarrhea Diseases among Selected Households in Abia state.*

Have you experienced diarrhea in any of your Children less than 5 years			
Educational level	**Yes**	**No**	**Total**
No formal education	70 100%	0 .0%	70
Primary	0 .0%	65 100.0%	65
Secondary	1240 85.5%	210 14.5%	1450
Tertiary	935 66.1%	480 33.9%	1415
Total	2245 74.8%	755 25.2%	3000

Chi-square = 72.460, df = 3, p-value < 0.001.

Table 5. *The Financial Strength of Parents and Its Influence In The Distribution of Under-Five Diarrhea Diseases among Selected Households In Abia State.*

Have you experience diarrhea in any of your Children less than 5 years			
Average monthly income	**Yes**	**No**	**Total**
< 18,000	215 50.6%	210 49.4%	425
18,000 – 29,000	460 76.7%	140 23.3%	600
30,000 – 49,000	455 87.5%	65 12.5%	520
50,000 – 99,000	785 85.8%	130 14.2%	915
100,000 and above	330 61.1%	210 38.9%	540
Total	2245 74.8%	755 25.2%	3000

Chi-square = 58.073, df = 4, p-value < 0.001.

Table 6. *The Environmental Factors and Its Influence in the Distribution of Under-Five Diarrhea Diseases among Selected Households in Abia State.*

Have you experience diarrhea in any of your Children less than 5 years			
What environmental factor is associated with diarrhea?	**Yes**	**No**	**Total**
Dirty and bushy surrounding	390 61.9%	240 38.1%	650
Contaminate Water and food	565 80.7%	135 19.3%	700
Poor toilet facility	480 76.8%	145 23.2%	625
Improper refuse disposal	500 82.6%	105 17.4%	605
Animals sheltered in household	240 72.7%	90 27.3%	330
Others	70 63.6%	40 36.4%	110
Total	2245 74.8%	755 25.2%	3000

Chi-square = 19.551, df = 3, p-value = 0.002.

4. Discussion

The socio-demographic characteristics of the respondents showed that 69.0 percent were female and 31.0 percent were males. Age group 31-40 years was the highest among the respondents (54.7 percent) while married respondents were 85.0 percent. In educational level, those that had secondary education was the highest (48.3 percent) followed by those that had tertiary education (47.2 percent). Their main occupation was trading 20.3 percent while 30.5 percent respondents lived on those that earn 18,000-29,000 naira monthly, 20.0 percent.

The findings revealed that the respondents knowledge of under five diarrhea disease among households do not significantly influence its occurrence in Abia state. (Chi Square = 1.354, p-value = 0.245). This may be due to the fact that majority of the respondents acquired secondary (48.3 percent) and tertiary education (47.2 percent) as showed in Table 2, which places them at a better position of adopting preventive health measures against diarrhea disease. This was in agreement with Yilgwan et al, (2012) in their report that educated mothers are more exposed to the importance of hygiene, better child care and feeding practices and are more aware of disease causation factors and preventive measures). Also, it is likely be because the staff of health centers sensitizes parents especially nursing mothers during immunization schedules about childhood diseases in which diarrhea is among. Similarly, the result in Table 2 showed contaminated food, 7.7 percent, was the major cause of diarrhea followed by bad water (4.8 percent). These findings however was in agreement with the study of Akimbami, (2007) that living in location where there is unsafe drinking water and poor handling of sewage causes infectious diarrhea. It also conformed with Environmental Health Project, (2012) that identified a number of environmental factors such as lack of safe water, inadequate excreta disposal facilities, poor hygiene, poor living conditions and unsafe food as accounting for as much as 88% of the disease burden due to diarrhea.

The educational level of parents in this study revealed that those who attained secondary and tertiary education experienced diarrhea more in their children less than five years when compared with those with lesser qualification. The result showed that the influence of educational attainment of parents in distribution of diarrhea disease among households was statistically significant. (Chi square = 72.460, p-value =0.001). This may probable be due to the awareness associated with education. The findings was in line with what Yilgwan et al, (2012) emphasized that education is a vital tool in enlightening mothers and also changing their health care seeking behavior and practices. The findings was not in agreement with Yohannes et al, (1992) and Levine et al, (1991) report that the prevalence of diarrhea varies according to education of mother, being significantly lower among children of more educated mothers than among children of mothers with no education. This is probably because education provides the knowledge of the rules of hygiene, feeding and weaning practices and the interpretation of symptoms which enhances timely action on childhood illness Levine et al, (1991).

Financial strength of parents in this study statistically influence the distribution of under five diarrhea diseases among households in Abia state, (Chi-square = 58.073, p-value < 0.001). Those whose average monthly income was between 30,000 – 49,000 Naira (87.5 percent) experienced diarrhea more in their under five children, followed by those whose average monthly income was between 50,000 – 99,000 Naira (85.5 percent). The findings were in line with what Fening et al, (2008) documented that the relationship between socioeconomic status and health indicators has been widely studied, and it's recognized as a cause-effect relationship and access to social services such as education, housing, food, portable water as well as equitable income distribution are important determinants of individual health conditions. Furthermore, those whose average monthly income was less than 18,000 (50.6 percent) recorded the least

experience of diarrhea in their under-five children. This could be attributed to their health promotion and preventive measures. The findings was contrary to what Ahmed et al, (2012) found in their studies that low family income is a possible risk factor of acute malnutrition in wasted children under 2 years old and in severely underweight under-five children in Bangladesh.

It was found in this study in the terms of the environmental factors that improper refuse disposal (82.6 percent) and contaminated water and food (80.7 percent) had highest influence in the distribution of under five diarrhea diseases among household in Abia state. This was in agreement with the study of Akimbami, (2007) that bacteria and parasitic infections of diarrhea are common in locations where there is unsafe drinking water and poor handling of sewage. It also conformed with Environmental Health Project, (2012) which identified a number of environmental factors such as lack of safe water, inadequate excreta disposal facilities, poor hygiene, poor living conditions and unsafe food as accounting for as much as 88% of the disease burden due to diarrhea. It was also indicated that poor toilet facility, (76.85 percent) influence the distribution of diarrhea disease in under-five children followed by animal sheltered in household, (72.7 percent) with the least been the present of dirty and bushy surrounding, (61.9 percent). Similarly, this conformed to the findings of Yohannes et al, (1992), Boadi, (2005) and Levine et al, (1991) that lack of access to a toilet facility is associated with a high incidence of diarrhea. Also, they emphasized that public latrines are generally unhygienic and unhealthy for children due to the presence of flies and dirty floors, which promote infections such as cholera, shigella, salmonella and rotavirus, all of which have been shown to be major causes of diarrhea in children. The results when put to statistical tests showed that the environmental factors significantly influence the distribution of diarrhea diseases among households in Abia state, (Chi-square = 19.551, p-value = 0.002).

5. Conclusion

The study was constrained to conclude that majority of the parents had good knowledge of the causes, signs and symptoms of diarrhea as well as the various environmental factors of diarrhea. The health centers and hospitals where the common contact of information/ awareness about diarrhea. Knowledge of under-five diarrhea disease among households was not found to influence its occurrence in Abia state (p-value = 0.245).

This hinges strongly on the need for inculcation of comprehensive health education programme of under-five diarrhea disease (by staff of health centers and hospitals during routine immunization schedule and hospital visitation) which encourages the early recognition of the signs and symptoms of diarrhea for commencement of prompt treatment, promotion of breastfeeding and improved nutrition, as well as environmental interventions to include improvements in water supply, food hygiene, proper waste management and control of domestic animals.

6. Recommendations

This study has showed that the socio-economic status of parents and environmental factors influences the occurrence of under-five diarrhea disease, hence it was recommended that:

1. The households especially mothers must be adequately educated or informed about the importance of using good hygiene practices regarding water, sanitation and food preparation to reduce or control diarrhea disease.
2. Provision of adequate toilet facilities which are important in combating diarrhea disease among households.
3. Furthermore, health and intervention programs including exclusive breastfeeding, which enhances children's physiological resistance against diarrhea disease and maternal hygiene education, should be strengthened in order to reduce the incidence of diarrhea.

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