Knowledge of Rural People on the Distribution of Sanitation-Related Diseases in Ebonyi State, Nigeria

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Abstract- 1The result showed that majority 245(53%) of the respondents were female and 129(28%) reported primary school as the most educational level of the caregivers. Out of 461 participants, 225(49%) reported that children within their household had suffered from any sanitation-related diseases. In regards to that, 149(33%) and 114(25%) reported malaria and diarrhoea respectively as the highest sanitation-related diseases suffered by some children within their household and they visited health centres for treatment. Due to disease conditions, majority 375(81%) spent less than a month to recover from the disease, 246(53%) reported they do get treatment from health centre/hospital. For the purpose of reducing the sanitation-related diseases, 180(39%) reported health education to focus on the impact of sanitation and hygiene practice. Also, 209(45%) reported that they have moderate level of knowledge of sanitation-related public health risks in relation to sanitation and hygiene. In conclusion, this study revealed that malaria, dysentery and diarrhea were higher than others reported sanitation-related diseases and the respondents had a moderate level of knowledge of sanitation-related diseasesin Ebonyi State. Therefore, it is recommended that everyone should engaged in good sanitation and hygiene practices in order to reduce the prevalence of sanitation-related diseases among children, adults and elderly.

Index Terms- Diarrhoea, Distribution, Knowledge, Malaria, Rural, and Sanitation-related diseases.

I. INTRODUCTION

Sanitation is important in primary health care unit and it stands as aspect of public health that is poorly addressed in low income countries. World Health Organization [WHO]/United Nations Children's Fund [UNICEF], [1] opined that globally, 2.6 billion people live without improved sanitation facilities and 533 million lived in sub-Sahara Africa. According to WHO/UNICEF, [2] reported that proper sanitation is important not only from the general health point of view, but it has an important role to play in individual and social life too. Understanding and practicing safe sanitation safe sanitation is necessary for human health, from the point of preventing infection to improving and maintaining mental and social well-being. In any society where there is lack of safe sanitation systems, it leads to infection and disease which includes diarrhoea, a major public health concern and a leading cause of disease and death among children under-five years in low- and middle-income countries [3].

On the same note, sanitation-related diseases weaken and kill one million Africans every year and previous years more than 2.4 billion people in the world lack access to adequate sanitation and such people have no option rather to dispose their excreta in unsanitary and unimproved conditions. Following such scenario, categories of people who suffer from such kind, lack most basic human needs and likely to be victims of poverty, health illness and in general experience poor quality of life [4; 5].

In 2015, it was estimated that one billion people have no sanitation facility of any kind and they were forced to practice open defecation. On this regard, almost all sanitation deficiencies are faced by vulnerable populations in low-income countries, and are primarily in rural settings and urban slums in Sub-Saharan Africa [6].

From the global population, in 2017, 45% of the global population (3.4 billion people) used a safely managed sanitation service, 31% of the global population (2.4 billion people) used private sanitation facilities connected to sewers from which wastewater was treated, 14% of the global population (1.0 billion people) used toilets or latrines where excreta were disposed of in situ and 2.0 billion people still do not have basic sanitation facilities such as toilets or latrines [7].

In developing country like Nigeria, the main diseases of the environment are diarrhoeal disease, lower respiratory infections, unintentional injuries and malaria. In children under the age of five, one third of all disease is caused by the environmental factors such as water and air pollution [8]. From the reviewed literatures, one of the significant diseases that arise from poor sanitation is diarrhea. Deaths resulting from diarrhea are estimated to be between 1.6 and 2.5 million every year [9] and

National records show that every year, about six hundred thousand (600,000) episodes of diarrhea occur in children under the age of five [4]. It was also stated that over 25 million people die every year from diseases related to inadequate and poor sanitation and such conditions have been identified as the main cause of human illness. Thus, the most common diseases associated with inadequate and poor sanitation includes; diarrhoea and dysentery, typhoid, bilharzia, malaria, cholera, worms, eye infection and skin diseases [8]. WHO [10] stated the relevant diseases and conditions caused by lack of sanitation and hygiene includes; waterborne diseases (e.g. cholera, typhoid and Infectious hepatitis), which can contaminate drinking water, diseases transmitted by the fecal-oral route (diarrhoea and dysentery), stunted growth in children and malnutrition, particularly in children.

Furthermore, there about 15 diseases that could be reduced with proper access and improved sanitation and hygiene practices in developing countries and they include: Anaemia, malnutrition, Ascariasis (a type of intestinal worm infection), Campylobacteriosis, Cholera, Cyanobacteria toxins, Dengue, Hepatitis, Japanese encephalitis (JE), Leptospirosis, Malaria, Ringworm or Tinea (actually a fungal infection), Scabies, Schistosomiasis, Trachoma, Typhoid and paratyphoid enteric fevers and Shigellosis [10]. Therefore, this study aimed to determine the knowledge of the distribution of sanitation-related diseases in Ebonyi State, Nigeria

II. Materials and Methods

This study adopted a descriptive cross-sectional design to determine the distribution of sanitation related diseases in Ebonyi State, Nigeria. This design helped to gather information across the state to achieve the stated objective from primary source with the aid of well structured questionnaire.

The sample size was determined based on the information from primary source during the study period and people of child age were studied. The variables associated with community sanitation were determined using sample size formula by Kish and Leslie for cross-sectional descriptive studies needed to be representative of the given population. The same formula used by Fisher et al., [11] for a population > 1,000 was adopted for this study.

$$n = \frac{z^2 q\,(1-P)}{d^2}$$

n = Minimum sample size

Z = Standard normal deviation usually set at 1.96 which corresponds to the 95% confidence level.

p = Assumed population prevalence in %, Population of the study is estimated to be 50% to represent the target population in this study

q = 1-p

d = Maximum acceptable random sampling error in %

In this case,

P= 50%= 0.5

q = 1- 0.5 =0.5

d = 5%= 0.05

Therefore,

$$\text{Sample size (n)} = \frac{(1.96)^2\,(0.50)\,(0.50)}{(0.05)^2}$$

n =384

Adding an iteration of 20% to cover for non response (20% X 384) = 76.8 sample size to the nearest hundred= 384+76.8=460.8. For more clarity and coverage, the figure was rounded up to 461 for easy computation.

A multistage sampling was used to select the samples included in the study. At first, stage Ebonyi state was divided into three senatorial zones and 6 Local Government Areas (LGAs) were randomly selected through balloting which covered at least 46% of the LGAs. Ebonyi North has 4 LGAs and Ebonyi central has 4 LGAs while Ebonyi south contained 5 LGAs each, hence two LGAs namely Abakaliki LGA and Ebonyi LGA were selected from Ebonyi North; Ezza South LGA and Ikwo LGA were randomly selected from Ebonyi Central senatorial zones and Afikpo North LGA and Ohaozara LGA were randomly selected from Ebonyi South senatorial zones. The selected LGAs include Abakaliki LGA, Ebonyi LGA, Ezza South LGA, Ikwo LGA, Afikpo north LGA and Ohaozara LGA were randomly selected from all the senatorial zones in Ebonyi State.

The second stage of the sampling involved random selection of communities from the sampled LGAs. Two communities were selected from all the sampled LGA. At stage three, primary health centrers (PHCs) were selected from the randomly selected communities which produced 24 PHCs. Therefore, 20 subjects were interviewed in each PHC with the designed questionnaire and it gave a total of 480 but 461 was valid.

The data collected with the aid of questionnaire were analyzed through descriptive statistics after been coded into Statistical Package for Social Science (SPSS version 20.0) and qualitative data was presented in tables with frequency and percentage and charts.

III. Results

Socio-Demographic Data of Subjects

A total of 461 subjects from the 6 Local Government Areas participated in the study. Out of 461 samples distributed, five LGAs out of six studied LGAs received 80 samples each but only Ebonyi LGA had 61 samples. In tables below, "n" represents the number while "%" represents percentage value.

In Abakaliki LGA, 38(17.6%) were male while 42(17.1%) were female. In Ebonyi LGA, 20(9.3%) were male while 41(16.7%) were female. In Ezza South LGA, 45(20.8%) were male while 35(14.3%) were female. In Ikwo LGA, 42(19.4%) were male while 38(17.1%) were female. In Afikpo North LGA, 39(18.0%) were while 41(16.7%) were for female. In Ohaozara LGA, 32(18.8%) were male while 48(19.6%) were female. In general, 216(47%) were male while 245(53%) were female.

Concerning the age of the child; in Abakaliki LGA, 0-5 years had 15(15.8%), for 6-10 years had 30(18.5%); 11-15 years had 12(20%). In Ebonyi LGA, 0-5 years had 35(14.6%), for 6-10 years had 20(12.3%); 11-15 years had 6(10%). In Ezza South LGA, 0-5 years had 42(17.6%), for 6-10 years had 35(21.6%); 11-15 years had 3(5%). In Ikwo LGA, 0-5 years had 38(15.8%), for 6-10 years had 32(19.7%); 11-15 years had 10(16.7%). In Afikpo North LGA, 0-5 years had 40(16.7%), for 6-10 years had 25(15.4%); 11-15 years had 15(25%). In Ohaozara LGA, 0-5 years had 46(19.2%), for 6-10 years had 20(12.3%); 11-15 years

had 14(23%). In all the LGAs, 0-5 years had 239 (52%), for 6-10 years had 162(35%); 11-15 years had 60(13%).

Concerning the age of the caregivers; in Abakaliki LGA; 21-30 years had 20(12.6%); 31-40 years had 24(13.1%); 41-50 years had 30(18.5%), 51-60 years had 7(35%) and 61-70 years had 4(44.4%). In Ebonyi LGA, 21-30 years had 12(13.8%); 31-40 years had 18(9.8%); 41-50 years had 27(16.7%), 51-60 years had 5(25%) and 61-70 years had 3(33.3%). In Ezza South LGA, 21-30 years had 16(18.4%); 31-40 years had 33(18%); 41-50 years had 25(15.4%), 51- 60 years and 61- 70 years had 2(10%) and 2(22.2%) respectively. In Ikwo LGA, 21-30 years had 10(20.7%); 31-40 years had 43(23.5%); 41-50 years had 22(13.6%); 51-60 years had 2(10%) and no response on above. In Afikpo LGA, 21-30 years had 15(17.2%); 31-40 years had 33(18%); 41-50 years had 30(18.5%); 51-60 years had 4(20%) and no response on above. In OhaozaraLGA, 21-30 years had 14(16.1%); 31-40 years had 32(17.5%); 41-50 years had 28(18.3%); 51-60 years had 4(20%) and no response on above. In all the LGAs; 21-30 years had 87(18.9%); 31-40 years had 183(40%); 41-50 years had 162(35%); 51-60 years had 20(4.3%) and no response on above 61-70 years had 9(2%).

Sex of the caregivers; in Abakaliki LGA, 8(6.2%) were male while 72(21.7%) were female. In Ebonyi LGA, 17(13.1%) were male while 44(13.3%) were female. In Ezza South LGA, 30(23.3%) were male while 50(16.1%) were female. In Ikwo LGA, 28(21.7%) were male while 52(15.7%) were female. In Afikpo North LGA, 26(20.2%) were while 54(16.3%) were for female. In Ohaozara LGA, 20(15.1%) were male while 60(18.1%) were female. In general, 129(28%) were male while 332 (72%) were female.

For the level of education of the caregivers; in Abakaliki LGA, 15(13.5%) reported no formal education; 14(10.8%) said they had primary education; 23(20.2%) said secondary education; 28(26.1%) said tertiary education. In Ebonyi LGA, 16(14.4%) reported no formal education; 12(9.3%) said they had primary education; 15(13.2%) said secondary education; 18(16.8%) said tertiary education. In Ezza South LGA, 27(24.3%) reported no formal education; 29(22.5%) said they had primary education; 16(14%) said secondary education; 8(7.5%) said tertiary education. In Ikwo LGA, 23(20.7%) reported no formal education; 33(25.6%) said they had primary education; 17(14.9%) said secondary education; 7(6.5%) said tertiary education. In Afikpo North LGA, 15(13.5%) reported no formal education; 14(10.8%) said they had primary education; 27(23.7%) said secondary education; 24(22.4%) said tertiary education. In Ohaozara LGA, 15(13.5%) reported no formal education; 27(20.9%) said they had primary education; 16(14.3%) said secondary education; 22(20.6%) said tertiary education. In all the LGAs, 111 (24%) reported no formal education, 129(28%) for primary education, 114(25%) secondary education, 107(23%) were tertiary education.

For the occupational of the caregivers; in Abakaliki LGA, 24(13.5%) were farmers; 35(24.8%) were traders; 4(6.3%) were artisans; 9(29%) were civil servants; 8(19.5%) were students and no response for others. In Ebonyi LGA, 6(3.4%) were farmers; 28(19.8%) were traders; 8(12.7%) were artisans; 7(22.6%) were civil servants; 9(21.9%) were students and 3(37.5%) were for others. In Ezza South LGA, 50(28.2%) were farmers; 11(7.8%) were traders; 10(15.8%) were artisans; 3(9.7%) were civil servants; 5(12.2%) were students and 1(12.5%) were for others.

In Ikwo LGA, 35(18.3%) were farmers; 24(17%) were traders; 12(19%) were artisans; 2(6.4%) were civil servants; 5(12.2%) were students and 2(25%) were for others. In Afikpo North LGA, 27(15.3%) were farmers; 20(14.1%) were traders; 16(25.4%) were artisans; 7(22.5%) were civil servants; 8(19.9%) were students and 2(25%) were for others. In Ohaozara LGA, 35(18.3%) were farmers; 23(16.3%) were traders; 13(20.6%) were artisans; 3(9.7%) were civil servants; 6(14.6%) were students and no response for others. In all the LGAs, 177(38%) were farmers; 141(31%) were traders; 63(14%) were artisans; 31(7%) were civil servants; 41(9%) were students and 8(2%) for others.

For the monthly income of the caregivers in the household; in Abakaliki LGA, 24(14.5%) earned less than ₦30,000; 23(18.6%) earned ₦31-40,000; 9(8.8%) earned ₦41-50,000; 13(28.9) earned ₦51-60,000; 7(38.9%) earned ₦61-70,000; 4(50%) earned ₦71-80,000 and no response for above ₦81,000. In Ebonyi LGA, 12(7.2%) earned less than ₦30,000; 28(22.7%) earned ₦31-40,000; 6(5.8%) earned ₦41-50,000; 9(20%) earned ₦51-60,000; 4(22.2%) earned ₦61-70,000; 2(25%) earned ₦71-80,000 and no response for above ₦81,000. In Ezza South LGA, 34(20.6%) earned less than ₦30,000; 16(13%) earned ₦31-40,000; 23(22.5%) earned ₦41-50,000; 5(11.1) earned ₦51-60,000; 2(11.1%) earned ₦61-70,000; no response for ₦71-80,000 and no response for above ₦81,000.

In Ikwo LGA, 36(21.8%) earned less than ₦30,000; 14(11.4%) earned ₦31-40,000; 23(22.5%) earned ₦41-50,000; 5(11.1%) earned ₦51-60,000; 2(11.1%) earned ₦61-70,000; no response for ₦71-80,000 and no response for above ₦81,000. In Afikpo North LGA, 21(12.7%) earned less than ₦30,000; 25(20.3%) earned ₦31-40,000; 21(20.6%) earned ₦41-50,000; 9(20%) earned ₦51-60,000; 2(11.1%) earned ₦61-70,000; 2(25%) earned ₦71-80,000 and no response for above ₦81,000. In Ohaozara LGA, 38(23%) earned less than ₦30,000; 17(13.8%) earned ₦31-40,000; 20(19.6%) earned ₦41-50,000; 4(8.8%) earned ₦51-60,000; 1(5.6%) earned ₦61-70,000; no response for ₦71-80,000 and no response for above ₦81,000. In all the LGAs, 165(36%) earned less than ₦30,000; 123(27%) earned ₦31-40,000; 102(22%) earned ₦41-50,000; 45(10%) earned ₦51-60,000; 18(4%) earned ₦61-70,000; 8(2%) earned ₦71-80,000 and no response for above ₦81,000 (table 1).

Table 1: Overall Socio-Demographic Data

Variables	Abakaliki LGA		Ebonyi LGA		Ezza South LGA		Ikwo LGA		Afikpo North LGA		Ohaozara LGA		Total
	N	%	N	%	N	%	N	%	N	%	N	%	
Sex of the child													
Male	38	17.6	20	9.3	45	20.8	42	19.4	39	18.0	32	18.8	216(47%)
Female	42	17.1	41	16.7	35	14.3	38	17.1	41	16.7	48	19.6	245(53%)
Age of the child													
0-5 years	38	15.8	35	14.6	42	17.6	38	15.8	40	16.7	46	19.2	239 (52%)
6-10 years	30	18.5	20	12.3	35	21.6	32	19.7	25	15.4	20	12.3	162(35%)
11-15 yrs	12	20.0	6	10.0	3	5.0	10	16.7	15	25.0	14	23.0	60(13%)
Age of the caregivers													
21- 30 yrs	20	12.6	12	13.8	16	18.4	10	20.7	15	17.2	14	16.1	87(18.9%)
31-40 yrs	24	13.1	18	9.8	33	18.0	43	23.5	33	18.0	32	17.5	183(40%)
41- 50 yrs	30	18.5	27	16.7	25	15.4	22	13.6	30	18.5	28	18.3	162(35%)
51- 60 yrs	7	35.0	5	25.0	2	10.0	2	10.0	4	20.0	4	20.0	20(4.3%)
61- 70 yrs	4	44.4	3	33.3	2	22.2	0	0.0	0	0.0	0	0.0	9(2%)
Sex of the caregivers													
Male	8	6.2	17	13.1	30	23.3	28	21.7	26	20.2	20	15.1	129 (28%)
Female	72	21.7	44	13.3	50	16.1	52	15.7	54	16.3	60	18.1	332 (72%)
Educational level of the caregivers													
None	15	13.5	16	14.4	27	24.3	23	20.7	15	13.5	15	13.5	111 (24%)
Primary	14	10.8	12	9.3	29	22.5	33	25.6	14	10.8	27	20.9	129(28%)
Secondary	23	20.2	15	13.2	16	14.0	17	14.9	27	23.7	16	14.3	114(25%)
Tertiary	28	26.1	18	16.8	8	7.5	7	6.5	24	22.4	22	20.6	107(23%)
Occupational of the caregivers													
Farmer	24	13.5	6	3.4	50	28.2	35	18.3	27	15.3	35	18.3	177(38%)
Trader	35	24.8	28	19.8	11	7.8	24	17.0	20	14.1	23	16.3	141(31%)
Artisan	4	6.3	8	12.7	10	15.8	12	19.0	16	25.4	13	20.6	63(14%)
Civil servant	9	29.0	7	22.6	3	9.7	2	6.4	7	22.5	3	9.7	31(7%)
Student	8	19.5	9	21.9	5	12.2	5	12.2	8	19.9	6	14.6	41(9%)
Others	0	0.0	3	37.5	1	12.5	2	25.0	2	25.0	0	0.0	8(2%)
Monthly income of a Caregiver in the household													
< ₦30,000	24	14.5	12	7.2	34	20.6	36	21.8	21	12.7	38	23.0	165(36%)
₦31-40,000	23	18.6	28	22.7	16	13.0	14	11.4	25	20.3	17	13.8	123(27%)
₦41-50,000	9	8.8	6	5.8	23	22.5	23	22.5	21	20.6	20	19.6	102(22%)
₦51-60,000	13	28.9	9	20.0	5	11.1	5	11.1	9	20.0	4	8.8	45(10%)
₦61-70,000	7	38.9	4	22.2	2	11.1	2	11.1	2	11.1	1	5.6	18(4%)
₦71-80,000	4	50.0	2	25.0	0	0.0	0	0.0	2	25.0	0	0.0	8(2%)
₦81&above	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0

Distribution of Sanitation Related Diseases

Table 2 presented distribution of sanitation related diseases. The participants were if they have had their any child suffered from sanitation related diseases; in Abakaliki LGA, 38(17%) said yes while 42(18%) said no. In Ebonyi LGA, 18(8%) said 43(18%) said no. In Ezza South LGA, 42(17%) said yes while 38(16%) said no. In Ikwo LGA, 43(19%) said yes while 37(16%) said no. In Afikpo North LGA, 39(17%) said yes while 41(17%) said no. In Ohaozara LGA, 45(20%) said yes while 35(14%) said no. In general, 225(49%) said yes while 236(51%) said no.

The participants were asked to mention the diseases their child had suffered from; 24(5%) said cholera, 114(25%) said diarrhea, 99(21%) said dtysentery, 149(33%) said malaria, 64(13%) said typhoid fever, 5(1.0%) said infectious hepatitis, and 9(1.9%) said Lassa fever.

Participants' opinion on period they have suffered from the above sanitation related diseases; 375(81%) said less than a month, 75(16%) said last month, 11(2%) said three months ago and no response to six months above.

Due to the disease condition, participants were asked where do they get treatment for sick ones due to sanitation related diseases; 246(53%) said health centre/hospital, 153(33%) said close by chemist store, 45(10%) said pharmacy, 12(3%) said from family members and 5(1%) said traditional healers.

Participants thought that to reduce the burden of sanitation related diseases in Nigeria can be done through; 159(35%) said to campaigns against open defecation, 180(39%) said health education on the impact of sanitation and hygiene practice, 111(24%) said more research funding and 11(2%) said all of the above.

Participants were asked what they think is attributed to occurrence of sanitation related diseases; 123(27%) said poor water quality, 207(45%) said poor sanitation, 131(28%) said poor personal hygiene and no response to others.

The current level of knowledge of sanitation-related public health risks in relation to sanitation and hygiene; 144(31%) reported high, 209(45%) reported moderate and 108(23%) reported low.

The current level of knowledge of sanitation-related public health risks in relation to sanitation and hygiene; 144(31%) reported high, 209(45%) reported moderate and 108(23%) reported low.

Table 2: Distribution of Sanitation Related Diseases

Variables		Selected LGAs in Ebonyi State						
		Abakaliki LGA	**Ebonyi LGA**	**Ezza South**	**Ikwo LGA**	**Afikpo North**	**Ohaozara LGA**	**N(%)**
Have your child ever suffered from any sanitation related diseases	Yes	38(17%)	18(8%)	42(17%)	43(19%)	39(17%)	45(20%)	225(49%)
	No	42(18%)	43(18%)	38(16%)	37(16%)	41(17%)	35(14%)	236(51%)
If yes, which the diseases have your child suffered from	Cholera	3(12%)	4(17%)	3(12%)	6(25%)	4(17%)	4(17%)	24(5%)
	Diarrhoea	15(13%)	16(14%)	22(19%)	21(18%)	18(16%)	22(19%)	114(25%)
	Dysentery	13(13%)	15(15%)	17(17%)	20(20%)	16(16%)	18(18%)	99(21%)
	Malaria	41(27%)	20(13%)	24(16%)	10(7%)	34(22%)	23(15%)	149(33%)
	Typhoid	9(14%)	8(15%)	12(19%)	13(20%)	10(15%)	12(19%)	64(13%)
	Infectious hepatitis	1(20%)	0.0	2(40%)	1(20%)	0.0(%)	1(20%)	5(1.0%)
	Lassa fever	3(50%)	1(17%)	2(33%)	0.0	0.0	0.0	6(1.2%)
For how long, have he/she suffered from the above sanitation related diseases?	Less than a month	67(18%)	48(13%)	66(18%)	64(17%)	67(18%)	63(17%)	375(81%)
	Last month	10(13%)	11(14%)	13(17%)	14(18%)	12(16%)	15(20%)	75(16%)
	Three months ago	3(27%)	2(18%)	1(9%)	2(18%)	1(9%)	2(18%)	11(2%)
	Six months ago	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	More than 1 year	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Where do you get treatment for sanitation related diseases?	Health centre/hospital	53(21%)	30(12%)	39(16%)	39(16%)	45(18%)	40(16%)	246(53%)
	Close by chemist store	18(10%)	20(13%)	29(19%)	30(20%)	25(16%)	31(20%)	153(33%)
	Pharmacy	9(20%)	11(24%)	6(13%)	5(11%)	10(22%)	4(9%)	45(10%)
	From Family members	0.0	0.0	4(33%)	5(41%)	0.0	3(25%)	12(3%)
	Traditional healer	0.0	0.0	2(40%)	1(20%)	0.0	2(40%)	5(1%)
What you think can be done to reduce the burden of sanitation related diseases in Nigeria	Campaigns against open defecation	30(19%)	31(19%)	22(14%)	23(14%)	29(18%)	24(15%)	159(35%)
	Health education on the impact of sanitation and hygiene practice	21(12%)	2(1%)	47(26%)	42(23%)	25(14%)	43(24%)	180(39%)
	More research funding	26(23%)	25(22%)	10(9%)	14(13%)	24(22%)	12(11%)	111(24%)
	All of the above	3(27%)	3(27%)	1(9%)	1(9%)	2(18%)	1(9%)	11(2%)
What do you think is attributed to occurrence of sanitation related diseases	Poor water quality	23(19%)	25(20%)	17(14%)	18(15%)	23(19%)	17(14%)	123(27%)
	Poor sanitation	27(13%)	4(2%)	51(25%)	49(24%)	26(12%)	50(24%)	207(45%)
	Poor personal hygiene	30(23%)	32(24%)	12(9%)	13(10%)	31(24%)	13(10%)	131(28%)
	Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0
What is the current level of knowledge of sanitation-related public health risks in relation to sanitation and hygiene?	High	33(23%)	32(22%)	16(11%)	17(12%)	30(21%)	16(11%)	144(31%)
	Moderate	36(17%)	17(8%)	39(19%)	39(19%)	40(19%)	38(18%)	209(45%)
	Low	11(10%)	12(11%)	25(23%)	24(22%)	10(9%)	26(24%)	108(23%)

Figure 1 presented the participants' level of knowledge about sanitation related diseases; 44.3% reported moderate, 31.2% reported good, 24.5% reported poor.

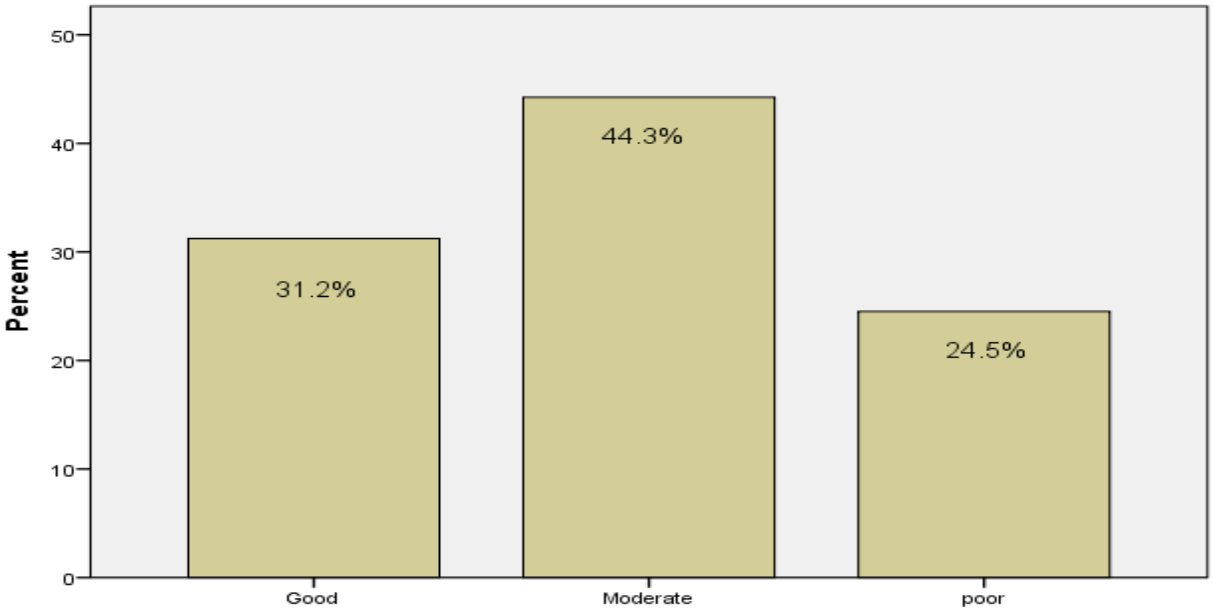

Figure 1: Level of knowledge of Rural People on the Distribution of Sanitation-Related Diseases

IV. Discussion

The findings of this study were focused on the knowledge of the distribution of sanitation related diseases in Ebonyi State, Nigeria. Relating to the distribution of sanitation practices in the study area, sanitation related diseases of diarrhea, malaria, dysentery, cholera, typhoid and infectious hepatitis, covid-19 and lassa fever seem to be prominent in the area but malaria, dysentery and diarrhea were more common among children under 5, relating to the findings by Yaya et al. [12] and Prüss-Ustün et al. [13] where the leading cause of death under the age 5 in developing countries was diarrhea and malaria.

The analysis revealed that malaria was the most reported disease of sanitation-related disease with 33% compared to others and the least was infectious hepatitis with 1%. The reason for high increase in malaria in the study area was not far poor sanitation practices influenced bytemperature, rainfall and relative humidity. The temperature influences the lifecycle of the parasite and its associated vectors makes temperature a major determinant of malaria risk [14] .According to World Health Organization [15], temperature is an important variable in the prevalence of malaria because temperature is particularly critical for the development of *Plasmodium falciparum* and the *Anopheles* vector. For example, at temperatures below 20°C, *P. falciparum* cannot complete its growth cycle in the *Anopheles* mosquito, and thus cannot be transmitted. Rainfall is associated with the expansion of mosquito breeding sites and its fertilization [16] . In regard to humidity, rainfall is the real climatic variable in Nigeria with June to September as reported by UNDP [17] that the rainiest months throughout the country. Humid conditions increase mosquito's life expectancy and rainfall increases vector population by creating new breading sites [18;19]. Therefore, too much rainfall will wash away breading sites and kill the mosquito larvae thereby reducing malaria transmission.

It has been reported that malaria and typhoid are a major public health problem in Nigeria where it accounts for more cases and deaths than any other countries in the world [19].

However, this is not a surprise, because the evidence of poor performance in sanitation and hygiene as revealed above and that has influenced the stage for high increase in sanitation-related disease prevalence. These prevalence levels of sanitation-related diseases are higher than the one observed by Sokhna et al., [20]. This evidence also calls for the urgent need for WASH interventions in the studied communities as recently demonstrated by Chard et al., [21] that found reduction of diarrhea diseases among children of the primary schools through WASH interventions in Mali as opposed to non-intervention schools.

V. Conclusion/ Recommendations

This study found malaria, dysentery and diarrhea to be higher than others reported sanitation-related diseases and the respondents had a moderate level of knowledge of sanitation-related diseasesin the state. The prevalence of sanitation-related diseases among the respondents of the study confirmed malaria, diarrhoea, dysentery, typhiod and cholera etc as the disease problem within the study areas. This study also revealed a statistically significant association between the prevalence of sanitation-related diseases and poor sanitation practice in the communities. Therefore, it is recommended that everyone should engaged in good sanitation and hygiene practices and when

washing hands or body make sure bacteria from the skin were removed to prevent infection and the spread of diseases.

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