Original Research Article

ANALYSIS OF WOMEN ENVIRONMENTAL HEALTH CONDITION IN OBIO-AKPO LOCAL GOVERNMENT AREA.

ABSTRACT

Environmental health encompasses the assessment and control of the environmental factors that can potentially affect health and is targeted towards preventing diseases and creating health-supportive environment. The specific objectives of the study are to: identify socio-economic characteristics of the respondents in the study area; describe the environmental health condition of the respondents; examine the WASH disease prevalence among the respondents; and determine the relationship between environmental health condition and WASH disease prevalence. A pre-test on analysis of Women Environmental Health condition in Obio-Akpo LGA, multi-stage sampling procedure was used in selecting a total of 50 women, questionnaires were used to elicit data from the respondents and the data was analysed using descriptive statistics, prevalence and correlation. The results indicated that the majority of the household heads were male, most of the respondents were married, and they were traders. The environmental health condition focusing on WASH showed the major source of water to the household is borehole, and do not do anything to make the water safer, with the toilet facilities being a water closet and they wash their hands after using the toilet. Typhoid –Malaria 13(26%) had the highest occurrence among other WASH diseases, and in total the prevalence of WASH diseases was 31(62%) among the respondents.

1.1 Introduction

Environmental health as used by the World Health Organisation (WHO) Regional Office in Europe, includes both the direct pathological effects of chemicals, radiation and some biological agents and the effects (often indirect) on health and wellbeing of the broad physical, psychological, social and cultural environment, which includes housing, urban development, land use and transport (Novice, Robert, 1999). Environmental health has been defined as those aspects of human health and disease that are determined by factors in the environment (WHO, 1990). It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect health.

According to the World Health Organization (WHO, 2013), environmental health addresses all environmental (physical, chemical and biological) factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of the environmental factors that can potentially affect health and is targeted towards preventing diseases and creating health-supportive environments. Environmental health includes these five pillars: disease control, water, sanitation and hygiene (WASH), built environment, occupational health and food safety and hygiene (FSH) (Save *et. al.*, 2013). WHO website on environmental health gave the same definition on environmental health but excludes behaviour not related to environment, the social and cultural environment and genetics (WHO, 2016).

According to a study by Dandy (2013), it was reported that about 60% of all infant mortality being linked to infectious and parasitic diseases are mostly water related. Water related diseases vary substantially in their nature, transmission, effects, and management, therefore,

they can be organized into four categories: water borne diseases, water based diseases, water scarce diseases and water related vector diseases.

Water borne diseases are dirty water diseases. They are diseases caused by water that has been contaminated by human, animal, or chemical wastes. Water borne diseases include cholera, typhoid, shigella, polio, meningitis, and hepatitis A and E. Human beings and animals are host to the bacterial, viral, or protozoan organisms. While water based diseases are caused by aquatic organisms that spend part of their life cycle in the water and another parts as parasites in animals. These organisms can thrive in either polluted or unpolluted water. As parasites, they usually take the form of worms, using intermediate animal's vectors such as snails to thrive, and then directly infecting human either by boring through the skin or by being swallowed. Water based diseases include guinea worm (dracunculiasis), paragonimiasis, clonorchiasis, and schistosomiasis (bilharzia). These diseases are caused by a variety of flukes, tapeworms, roundworms and tissue that cause these diseases, (Raimi, Pigha, and Ochayi, 2017)

The environment contains elements essential for the maintenance of good health, as well as potential hazards. Most of the deleterious environmental conditions are caused by human activities. As the first country to industrialize, Britain was the first country to be confronted by the grim effects of the deteriorating environment on health. The slum that accommodated the working class in nineteen century Britain were noted for their narrow alleys and tenement housing, the total inadequacy of the water supplies and sewage system, the squalor and violence on the streets. The noxious air and vapours generated by the filth in these slums were said to have led to the prevalence of diseases, which made the slums fever dens while the inhabitants were feared as agents of infection (Best, 2010).

According to the centre for disease control and prevention (CDC, 2012). Prevalence, sometimes referred to as prevalence rate, is the proportion of persons in a population who have a particular disease or attribute at a specified point in time or over a specified period of time. The prevalence signifies current cases of a disease and can be perceived as a measure of disease status; it is the proportion of people in a population having a disease:

$$\text{Prevalence} = \frac{\text{Number of subjects having the disease at a point in time}}{\text{Total number of subjects in the population}}$$

The prevalence is often useful as it reflects the burden of a disease in a certain population. This is not limited to burden in terms of monetary costs; it also reflects burden in terms of life expectancy, morbidity, quality of life, or other indicators. Knowledge of the burden of disease can help decision makers to determine where investments in health care should be targeted (Noordzij, Dekker, Zocc-ali and Jager, 2010).

According to the national institute of mental health (NIH, 2017). Prevalence is the proportion of a population who have a specific characteristic in a given time period, which is estimated by randomly selecting a sample (smaller group) from the entire population they want to describe. Using random selection methods increases the chances that the characteristics of the sample similar to the characteristics of the population. For a representative sample, prevalence is the number of people in the sample with the characteristic of interest, divided by the total number of people in the sample.

$$\text{Prevalence} = \frac{\text{Number of people in sample with characteristic}}{\text{Total number of people in sample}}$$

In order to ensure a selected sample is representative of an entire population, statistical 'weights' may be applied. Weighting the sample mathematically adjusts the sample characteristics to match with the target population.

However, Prevalence may be reported as a percentage (5%, or 5 people out of 100), or as the number of cases per 10,000 or 100,000 people. The way prevalence is reported depends on how common the characteristic is in the population.

- There are several ways to measure and report prevalence depending on the timeframe of the estimate.
- Point prevalence is the proportion of a population that has the characteristic at a specific point in time.
- Period prevalence is the proportion of a population that has the characteristic at any point during a given time period of interest. "Past 12 months" is a commonly used period.
- Lifetime prevalence is the proportion of a population who, at some point in life has ever had the characteristic.

1.2 Problem Statement

The environmental health indicators are made up of intermediate and impact indicators; these indicators are most routinely used for monitoring the three most common environmental health problems faced in developing countries, which includes Malaria, ARI (Acute Respiratory Infection) and Diarrhoea. Although the malaria-related indicators have been developed from the WHO initiated Roll Back Malaria (RBM). In the case of ARI these indicators include availability of ventilation in poor households, children sleeping in cooking

areas, and the types of cooking stoves and fuel used are the indicators for assessing respiratory infections (Acute respiratory infection and chronic respiratory infection). Access to sanitation, complimented with quantity of water used per capita and hours of available water supply, disposal practices of faeces and hand washing behaviour are indicators for assessing diarrhoea. Data from 2015–2017 highlight that no significant progress in reducing global malaria cases was made in that period. There was an estimated 219 million cases and 435 000 related deaths in 2017. The World malaria report 2018 draws on data from 87 countries and areas with ongoing malaria transmission. The information is supplemented by data from national household surveys and databases held by other organizations (WHO, 2018).

Numbering

1.4 Research questions

Giving the expected interrelationship between1. environmental health condition and WASH diseases, there is a need to explore the following research questions in the course of this study:

i. What are the socio-economic characteristics of households in the rural communities which constitute the study area?
ii. How would the environmental health condition of the respondents be described?
iii. What are the WASH disease prevalence among respondents?
iv. Are there likely relationship between environmental health condition and WASH diseases prevalence?

1.5 Objectives of the study

The overall objective is to Analysis the women environmental health condition and Disease Prevalence in Obio Akpo LGA, Rivers State. The specific objectives of the study are to:

i. identify socio-economic characteristics of the respondents in the study area;
ii. describe the environmental health condition of the respondents;
iii. examine the WASH disease prevalence among the respondents; and
iv. Determine the relationship between environmental health condition and WASH diseases prevalence.

2.0 Methodology

2.1 The Study Area

The study was carried out in Obio Akpo local government area is in the metropolis of Port Harcourt, in Rivers state, one of the major centres of economic activities in Nigeria, and one of the major cities of the Niger Delta. The local government area covers 260 km^2 and at the 2006 Census held a population of 464,789. Obio-Akpor has its headquarters at Rumuodomaya and it is populated by the Ikwerre subgroup of Igbo people.

Obio-Akpor is bounded by Port Harcourt (local government area) to the south, Oyigbo and Eleme to the east, Ikwerre and Etche to the north, and Emohua to the west. It is located between latitudes 4°45'N and 4°60'N and longitudes 6°50'E and 8°00'E. Covering around 90 sq mi, Obio-Akpor is generally a lowland area with average elevation below 30 metres above sea level. Its geology comprises basically of alluvial sedimentary basin and basement complex. The thick mangrove forest, raffia palms and light rainforest are the major types of vegetation. Due to high rainfall, the soil in the area is usually sandy or sandy loam. The economic activities in Obio/Akpor local government area during one of the Agricultural Zones of Agricultural Development Programs of Rivers State (Ibemere and Ezeano, 2014).

Crop farming (e.g yam, cassava and vegetables) is the principal source of livelihood. There are also rivers, streams, and creeks which make fishing one of the occupations.

2.2 Sampling techniques, frame and sample size

Multi-stage sampling procedure was employed for this study. The first stage involves the selection of one (1) Local Government Area (LGA) out of the twenty-three (23) LGAs. it was randomly selected. The second stage involves a random selection of five (5) communities in the LGA. The third stage involves the selection of ten (10) respondents from each of the community by snowballing, to make a total of fifty (50) respondents. The eligibility criteria for the respondents would include those that have stayed in the community for a period of at least three months. A total of 50 women were randomly selected from Obio/Akpor LGA.

2.3 Methods of data collection

The selected women were interviewed with the aid of structured questionnaires. The total number of questionnaires used for the analysis represented 100% (50) in order to meet the targeted number of respondents extra five copies were made and discarded.

2.4 Analysis of Results

The data was analysed using descriptive statistics which was used to analyse the socio-economic characteristics and the environmental health condition of the respondents, Prevalence was used to determine the prevalence of WASH diseases and correlation regression was used to determine the relationship between the environmental health condition and the prevalence of WASH disease.

3.0 Results

3.1 The socioeconomic characteristics of the respondents

According to table1 below, the total number of the respondents interviewed were fifty (50) with equal distribution of respondents within the community having ten (10) respondents from each community the survey was conducted includes (Alakahia, Eliozu, Rumuosi, Rumuokoro and Choba). The house-hold head were mostly male 30(60.0%) and the female 20(40.0%) in the study area. The household size of the respondents indicated that majority of the respondents 42(84%) were within the range of one (1) to five (5) and the rest of the respondents 8(16%) were made up of six (6) to ten (10) household members, with an average number of four (4) in a household. Age of the respondents, the average age of the respondent is 43 with half of the respondents cumulatively within 21-30 and 31-40 years of age with 12(24%) and 13(26%) respectively. The native languages were Yoruba 5(10%), Igbo 16(32%), Ikwerre, Urobo, Kalabari Efik, Tiv, and Ogoni were 29(58%) which made up for others. Majority of the respondents were married 31(62.0%), single 14(28%) while the widows, separated were 3(6%) and 2(4%) respectively. Few of the respondents had no education 4(8%) the primary, junior secondary, and tertiary were 10(20%), 13(26%), 7(14%) respectively, while the secondary 16(32%) level of education was high. Most of the respondents were traders 24(46%) while one (1) of the respondents is solely into farming 1(2%), some of the respondents were into farming and other activities 7(14%), while Artisan, Civil servant and traders were 6(12%), 13(26%) and 23(46%) respectively. Most of the respondents 37(74%) were not into farming, while the rest of the respondents 13(26%) are into crop production (Cassava production and vegetables). Few of the respondents were members of a cooperative 14(28%) while others 36(72%) do not belong to a cooperative society.

Table 1. The socioeconomic characteristic of the respondents

Socio-Economic Characteristics	Frequency	Percentage	Mean
Communities			
Alakahia	10	20.0	
Eliozu	10	20.0	
Rumuosi	10	20.0	
Rumuokoro	10	20.0	
Choba	10	20.0	
House hold head			
Female	20	40.0	
Male	30	60.0	
Household size			
1-5	42	84	4
6-10	8	16	
Age			
21-30	12	24.0	
31-40	13	26.0	43
41-50	10	20.0	
51-60	13	26.0	
≥61	2	4.0	
Native languages			

	Yoruba	5	10.0
	Igbo	16	32.0
	Others	29	58.0
Marital Status			
	Married	31	62.0
	Single	14	28.0
	Separated	2	4.0
	Widow	3	6.0
Level of Education			
	No education	4	8.0
	Primary	10	20.0
	Junior secondary	13	26.0
	Secondary	16	32.0
	Tertiary	7	14.0
Current profession			
	Solely farming	1	2.0
	Farming and others	7	14.0
	Artisan	6	12.0
	Civil servant	13	26.0
	Trader	23	46.0

Type of farming		
Crop	13	26.0
None	37	74.0
Cooperative member		
Yes	14	28.0
No	36	72.0

Source Pre-test Field survey, 2022.

3.2 The Environmental health conditions of the respondents

In table 2, the source of drinking water for the respondents in the study area includes piped water into the kitchen 9(18%), borehole within the compound 18(36%) and bottle water/pure water 23(46%) which signifies for the majority of the respondents. The source of water for cooking were mainly piped into the kitchen 28(56%) and borehole (Private) 22(44) which are boreholes within the respondents compound or that of their neighbours. The average time of fetching water was less than 15 minutes for 18(36%) of the respondents, within fifteen (15) to thirty (30) minutes 4(8%) of the respondents are able to fetch water, majority 28(56%) of the respondents had water piped into the kitchen and toilet. The time to fetch enough water for household per day, majority 28(56%) of the respondents had the water supplied into the kitchen and toilet while the rest of the respondents had to go less than thirty (30) minutes and 31-60 minutes which were 15(30%) and 7(14%) respectively. Those households that do not have water piped into their kitchen and bathroom had majority of the adult women 13(26%) fetch water, with that of the adult women and children being 6(12%) and few of the respondents had their children 3(6%) being the only ones that fetch water. Bulk 42(84%) of

the respondents do not do anything to make their water safe while others 8(16%) keep the water safe. The few respondents that keep their water safe were boiling and using water guard which were 6(12%) and 2(4%) respectively. More than half of the respondents uses a water closet 30(60%) while others 20(40%) uses pour and flush. Less than five (5) households shares a toilet 7(14%), few 2(4%) respondents has to share the toilet with more than ten households while other respondents 41(82%) of the respondents do not share toilet with other households. Majority of the respondents 48(96%) of the respondents wash their hands while a few of them 2(4%) do not wash their hands. It was common among the respondents 37(74%) wash their hands with soap and water while others 13(26%) wash their hands at times with soap and water, they just rinse their hands with water. Three 3(6%) of respondent had babies they feed with their hand and they wash their hands before feeding their babies while others 47(94%) do not have babies they feed with their hands. Majority 35(70%) of the respondents are aware of water sanitation and hygiene diseases and others 15(30%) are not aware of such diseases.

Table 2: Environmental health conditions of the respondents

WASH	Frequency	Percentage
Source of drinking water		
Piped into toilet and kitchen	9	18.0
Borehole (private)	18	36.0
Bottle water/pure water	23	46.0
Source of water for cooking		
Piped into toilet and kitchen	28	56.0
Borehole (private)	22	44.0

Average time to fetch water		
Piped	28	56.0
Less than 15 minutes	18	36.0
15-30 minutes	4	8.0
Time to fetch enough water for household per day		
Supplied	28	56.0
Less than 30mins	15	30.0
31-60mins	7	14.0
Who fetches water for the household		
Adult women	13	26.0
Adult women and children	6	12.0
Children	3	6.0
None	28	56.0
Do you do anything to make the water safer?		
Yes	8	16.0
No	42	84.0
What do you do to make water safer for drinking?		
Boiling	6	12.0
Water guard	2	4.0
None	42	84.0

Type of toilet facility		
Water closet toilet	30	60.0
Pour flush	20	40.0
Number of household that share the toilet		
Less than five	7	14.0
More than ten	2	4.0
None	41	82.0
Do you wash your hands after using the toilet?		
Yes	48	96.0
No	2	4.0
Do you wash your hands with soap and water?		
Yes	37	74.0
At times	13	26.0
Do you wash your hands after cleaning your baby?		
Yes	3	6.0
Not applicable	47	94.0
Do you wash before cooking?		
Yes	33	66.0
At times	17	34.0

Do you wash your hands before eating?		
Yes	50	100.0
Do you wash your hands before feeding your baby?		
Yes	3	6.0
Not applicable	47	94.0
Are you aware of any water sanitation &hygiene diseases?		
Yes	35	70.0
No	15	30.0

Source Pre-test Field survey, 2022.

3.2.1 Occurrence of WASH diseases in the past 12months

The diseases related to WASH that occurred in the past 12months as shown in table 3, none of the respondents 19(38%) had diseases related to WASH in the past 12 months. While the remaining respondents 6(12%) had Cholera, Diarrhoea occurred in 10(20%) of the respondents, Typhoid malaria occurred in 13(26%) of the respondents while Skin Infection and COVID-19 were 1(2%) each.

Table 3: Diseases related to WASH that occurred in the past 12months

Diseases related to WASH	Frequency	Percentage
None	19	38.0
Cholera	6	12.0
Diarrhoea	10	20.0
Typhoid malaria	13	26.0

Skin Infection	1	2.0
COVID-19	1	2.0

Source Pre-test Field survey, 2022.

3.3 The Prevalence of WASH diseases

The WASH diseases was prevalence in more than half of the respondents 31(62%), while the rest of the respondents did not experience prevalence of WASH diseases in the past twelve (12) months.

Table 4: The prevalence of WASH diseases among the respondents in the past 12months

Prevalence of WASH disease	Frequency	Percentage
Prevalence	31	62.0
No Prevalence	19	38.0

Source Pre-test Field survey, 2022.

Numerator = 31 Prevalence of WASH disease

Denominator = 50 women

Prevalence = (31/50) × 100 = 0.62 × 100 = 62%

3.4 The relationship between WASH disease prevalence and Environmental Health condition among the respondents

There was a positive relationship between the prevalence of WASH disease and the source of drinking water but not significant. There is a negative relationship between the source of water for cooking and prevalence of WASH diseases but not significant. There was a negative relationship between the average time to fetch water and the Prevalence of disease which was significant at 0.01 level of significant. There was a negative relationship between the prevalence of diseases and the water piped into the kitchen and the bathroom or otherwise with a significant of 0.01 level. There was a negative relationshp between time to fetch enough water for household per day and prevalence of disease prevalence which was significant at 0.05. Doing or not doing anything to make the water safer for drinking had no significance to the prevalence of diseases. The type of toilet facilities had a negative relationship to the prevalence of diseases with a 0.01 level of significance. The number of household sharing a toilet has a negative relationship to prevalence of diseases with a very strong correlation and a 0.01 level of significance. Hand washing after using the toilet had a positive relationship to the WASH diseases prevalence and at a 0.01 level of significant. Hand washing with soap and water had a positive relationship with WASH diseases with 0.05 level of significant.

Table 5 Environmental condition and WASH disease prevalence correlation

Variables	**Pearson Correlation**	**Sig. (2-tailed)**	**n**
1. WASH disease Prevalence	1		50
2. Source of drinking water	0.265	0.063	50
3. Source of cooking water	-0.099	0.492	50
4. Average time to fetch water	-0.413**	0.003	50
5. Piped into Kitchen and bathroom	-0.388**	0.005	50
6. Time to fetched enough water for household/day	-0.307*	0.030	50

7. Do you do anything to make the water safer	0.046	0.752	50
8. Type of Toilet facility	-0.418**	0.003	50
9. Do you share toilet Facilities	-0.015	0.920	50
10. Number of Households that shared the toilet	-0.976**	0.000	9
11. Do you wash your hands after using the toilet	0.792**	0.000	50
12. Do you wash your hands with soap and water	0.287*	0.044	50

Source Pre-test Field survey, 2022. (** 1%, * 5%)

3.5 Discussion

3.5.1 Describe the environmental health condition of the respondents;

According to a study conducted in one of the developing countries it was noted that majority 80% and 60% of the respondents had their source of water for drinking and cooking from deep tube well and pond (Uddin and Rajonee, 2016). correspondingly the source of drinking water for the respondents in the study area (Obio-Akpor) includes piped water into the kitchen 9(18%), borehole within the compound 18(36%) and bottle water/pure water 23(46%) the source of water for cooking were mainly piped into the kitchen 28(56%) and borehole (Private) 22(44%) which are boreholes within the respondents compound or that of their neighbours, which signifies for the majority of the respondents, this is contrary to the study conducted for the entirety of developing countries in the past, this indicates an improvement. It was common among the respondents 42(84%) did not take any addition measure to make their water safer, while others 8(16%) keep the water safe. The few respondents that keep their water safe were boiling and using water guard which were 6(12%) and 2(4%) respectively, this is contrary to the study done in the North-western part of Nigeria

by Sridhar Okareh and Mustapha (2020) where it was indicated that majority of the respondents treated the water before using. More than half of the respondents in Obio-Akpor uses a water closet 30(60%) while others 20(40%) uses pour and flush. Less than five (5) households shares a toilet 7(14%), few 2(4%) respondents has to share the toilet with more than ten households while other respondents 41(82%) of the respondents do not share toilet with other households. Majority of the respondents 48(96%) of the respondents wash their hands while a few of them 2(4%) do not. Majority 37(74%) of the respondents wash their hands with soap and water while others 13(26%) wash their hands at times. Three 3(6%) of respondent has babies and they wash their hands before feeding their babies while others 47(94%) do not have babies they feed with their hands. Majority 35(70%) of the respondents are aware of water sanitation and hygiene diseases and others 15(30%) are not aware of such diseases. While this is contrary to a study conducted in Bangladesh which indicated that washing own hands after defecation was done by half of the respondents and few of the respondents wash hands with soap was before feeding a child, before preparing food for the family and before eating. (Raihan, Farzana, Sultana, Haque, Rahman, Waid, et al., 2017). This shows there is an improvement when compared to previous years

3.5.2 Examine the WASH disease prevalence among the respondents.

There was a positive relationship between the prevalence of WASH disease and the source of drinking water, an increase in the relationship there by indicating that if the source of water continues to be poor then there will be an increase prevalence of WASH diseases, though notably it was not significant. There was a decrease relationship between the source of water for cooking and prevalence of WASH diseases, that is a decrease in the poor source of water for cooking will bring about decrease in the prevalence of WASH diseases but not significant. There was a negative relationship between the average time to fetch water and the Prevalence of disease, a decrease in the average time to fetch water will bring about a

decrease in the prevalence of diseases, probably due to the reduced rate of contaminants and stress of conveying the water to where it is being used. Though a medium correlation which was significant at 0.01 level of significant. There was a negative relationship between the prevalence of diseases and the water piped into the kitchen and the bathroom, that is if there is a decrease in the poor supply of water piped into the kitchen and bathroom, there might bring about a decrease in the prevalence of WASH diseases with 0.01 level of significance. There was a negative relationship between time to fetch enough water for household per day and prevalence of disease prevalence, which shows a decrease in the time to fetch enough water for the household will bring about a decrease in the prevalence of WASH diseases which was significant at 0.05. Doing or not doing anything to make the water safer for drinking had no significance to the prevalence of WASH diseases, this might be due to the respondents having clean access to their source of water. A decrease in the poor state of the type of toilet facilities might make a decrease in the prevalence of WASH diseases with majority of the respondents using water closet or pour flush, which had a medium correlation with a 0.01 level of significance. The number of household sharing a toilet has a negative relationship to prevalence of WASH diseases that is a decrease in the number of people sharing a one toilet facility might bring about a decrease in the prevalence of WASH diseases, which had a strong correlation and a 0.01 level of significance. Hand washing after using the toilet had a positive relationship to the WASH diseases prevalence, an increase in the number of respondents that do not wash their hands will bring about an increase in prevalence of WASH diseases, it had a strong correlation and at a 0.01 level of significant. Hand washing with soap and water had a positive relationship with prevalence of WASH diseases, this indicates that when the respondents do not increase the rate of hand washing there would be an increase in the prevalence of WASH diseases, notably the correlation is weak with 0.05 level of significance.

4. Conclusion and Recommendation

The study conducted in the study area indicted that the respondents were aware of the WASH diseases and more than half of the respondents indicated the occurrence of Cholera, Diarrhoea, Typhoid malaria, Skin Infection and COVID-19 in the past 12 months. The following independent variables (average time to fetch water, piped into Kitchen and bathroom, type of toilet facility, number of households that shared the toilet, number of households that shared the toilet, and hand washing after using the toilet) were significant at 0.01 level of significance in correlation to the dependent variable WASH diseases and it is therefore recommended that the government in all levels and non-governmental organisations should encourage hand washing due to the strong correlation with the prevalence of WASH diseases among the respondents by providing easy access to water in the homes and other public spaces.

Reference

Best O., (2012). The use and misuse of mass distributed free insecticide-treated bed nets in a semi urban community in Rivers State, Nigeria.

CDC, (2012). Lesson 3: Measures of Risk Section 2: Morbidity Frequency Measures https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section2.html.

Ibemere IF, Ezeano CI (2014).Status of fish farming in Rivers State, Nigeria. Journal of Fisheries and Aquatic Science 9(5):321-329

Nation Institute of Mental Health (NIH). (2017) What is Prevalence? https://www.nimh.nih.gov/health/statistics/what-is-prevalence.shtml

Noordzij, M., Dekker, F. W., Zoccali, C., & Jager, K. J. (2010). Measures of disease frequency prevalence and incidence. Nephron Clinical Practice, 115(1), c17 c20.

Novice, Robert (editor) (1999). "Overview of the environment and health in Europe in the 1990s" (PDF). World Health Organization.

Raimi, M.O., Pigha, T.K. & Ochayi E.O. (2017). Water-Related Problems And Health Conditions In The Oil Producing Communities In Central Senatorial District Of Bayelsa State. Imperial Journal of Interdisciplinary Research (IJIR), Vol-3, ISSN: 2454-1362, http://www.onlinejournal.in

Sridhar, M. K. C. Okareh, O. T. and Mustapha, M. (2020). Assessment of Knowledge, Attitudes, and Practices on Water, Sanitation, and Hygiene in Some Selected LGAs in Kaduna State, Northwestern Nigeria.Journal of Environmental and Public Health / 2020 / **Article.** https://doi.org/10.1155/2020/6532512

Save K., Young S., Elizabeth C., Kondwani M., Kingsley L., Chikondi M., and Khumbo K., (2013). The Emerging Environmental Health Risks and Challenges for Tomorrow: Prospects for Malawi. Retrieved from https://www.ifeh.org/wehd/2013/Article_WEHD_Malawi.pdf

Uddin, M. J., & Rajonee, A. A. (2016). Present environmental condition and its impact on livelihood–a case study of two villages around the university of Barisal. Developing Country Studies, 7(9).

Raihan MJ, Farzana FD, Sultana S, Haque MA, Rahman AS, Waid JL, et al. (2017) Examining the relationship between socio-economic status, WASH practices and wasting. PLoS ONE 12(3): e0172134. https://doi.org/10.1371/journal.pone.0172134

WHO Environmental health [Internet].WHO. [Cited 2013 Jul 14]. Available from: http://www.who.int/topics/environmental_health/en/

World Bank, (1990), world DEVELOPMENT REPORT, POVERTY. New York: Oxford University Press.

World Health Organisation (2016). "Health topics: Environmental health". Retrieved 10 January 2015.

World health Organisation (2018). World Malaria Report https://www.who.int/malaria/publications/world-malaria-report-2018/en/