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Analysis of Environmental Health Conditions in Obio-Akpo Local Government Area, Rivers State

Azeez Falilat [a*]

[a] *Federal University of Technology Akure, Nigeria.*

Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Introduction: 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. Although, 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. This study shows the interrelationship between environmental health condition and WASH diseases (Cholera, Typhoid fever, and Diarrheal).

Materials and Methods: A pre-test on analysis of Environmental Health condition in Obio-Akpo LGA, multi-stage sampling procedure was used in selecting a total of 50 respondent who were women, questionnaires were used to elicit data from the respondents and the data was analysed using descriptive statistics, prevalence and correlation.

Results: The women in the study area indicated their willingness to participate in the survey when compared to the men, with the women having 50(100%) and the men 0(0%) participation. It was common among the respondents that 37(74%) wash their hands with soap and water while others 13(26%) wash their hands at times with soap and water, and at times they just rinse their hands with water. The diseases related to WASH that occurred in the past 12months among the respondents were 6(12%) had Cholera, Diarrhoea occurred in 10(20%) of the respondents, Typhoid malaria occurred in 13(26%) of the respondents, also Skin Infection and COVID-19 were 1(2%) each. While 19(38%) of the respondents had none of the diseases related to WASH in the past 12 months. The type of toilet facilities had a negative relationship to the prevalence of diseases with a 0.01 level of significance.

**Corresponding author: E-mail: Falilatazeez277@Gmail.Com;*

Discussion: There was prevalence of WASH disease among the respondents and it was above average, it is recommended that the government and non-governmental organisations should provide water in homes and public spaces due to the strong correlation between hand washing and prevalence of diseases.

Keywords: Environmental health; wash diseases; prevalence; preventing diseases.

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 that affects health (often indirect) and wellbeing of the broad physical, psychological, social and cultural environment, which includes housing, urban development, land use and transport [1].

According to the World Health Organization [2], 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) [3]. WHO website on environmental health gave the same definition on environmental health but excludes behaviour not related to environment, such as the social and cultural environment and genetics [4].

Water related diseases can be different, considerably in their nature, transmission, effects, and in managing them, which can be in four categories: water borne diseases, water based diseases, water scarce diseases and water related vector diseases. Water borne diseases are dirty water diseases, these 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 [5].

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 [6]. The need for the world to have safer water sanitation and hygiene (WASH) are important to human life, the global WASH diseases such as Diarrheal, cholera and Typhoid fever are diseases caused by unsafe water, poor sanitation, and inadequate hygiene [7].

Although, 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, 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 435000 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 [8]. The study aimed at determining the interrelationship between environmental health condition and WASH diseases (Cholera, Typhoid fever, and Diarrheal), the research questions that guided this survey where; what are the socio-economic characteristics of households in the communities which constitute the study area? how would the environmental health condition of the respondents be described? what are the WASH disease prevalence among respondents? and Are there likely relationship between environmental health condition and WASH

diseases prevalence? The overall objective is to Analyse the relationship between environmental health condition and Disease Prevalence in Obio Akpo LGA, Rivers State.

1.1 Limitation of the Study

- The findings of this study was limited to women willing to participate in the survey
- As a result of Pre-testing the total number of the respondent is fifty (50), so it cannot be generalized to the total population.

2. MATERIALS AND METHODS

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. 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 include agriculture, which in Obio/Akpor local government area during one of the Agricultural Zones of Agricultural Development Programs of Rivers State [9]. 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.

2.1 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 respondents were randomly selected from Obio/Akpor LGA.

2.2 Methods of Data Collection

The respondents were interviewed with the aid of structured questionnaires which included open ended and close ended questions, the open ended questions does not have options, respondents can state their thoughts while the closed ended questions has options where the respondents can choose from the options given. 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.

2.3 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 which was reported in percentages and correlation regression was used to determine the relationship between the environmental health condition and the prevalence of WASH disease.

Prevalence: According to the national institute of mental health [10]. 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.

$$\text{Prevalence} = \frac{\text{Number of people in sample with characteristic}}{\text{Total number of people in sample}} \quad (1)$$

In order to ensure a selected sample is representative of an entire population, statistical 'weights' may be applied. Weighing 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.

Prevalence= (No. of patients at home in the last 12months / household size)*100%..... (2)

Variables are

i. Number of patients at home in the last 12months (numbers)
ii. Household size (numbers)

Pearson Correlation: The Pearson Correlation produces a sample correlation coefficient (r), which measures the strength and direction of linear relationships between pairs of continuous variables. The Pearson correlation coefficient is typically used for jointly normally distributed data (data that follow a bivariate normal distribution). For none normally distributed continuous data, for ordinal data, or for data with relevant outliers, Schober, Boer, and Schwarte [11].

$$r = \frac{\sum(x_i-\bar{x})\,(y_i-\bar{y})}{\sqrt{\sum(x_i-\bar{x})^2\sum(y_i-\bar{y})^2}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

r = correlation coefficient
x_i= values of the x-variable in a sample
$\bar{x}$ = mean of the values of the x-variable
y_i = values of the y-variable in a sample
$\bar{y}$ = mean of the values of the y-variable
Y = WASH disease Prevalence (Percentage)
X_1 = Source of drinking water (1. river/steam 2. hand dug well 3. rain water 4. public tap 5.mono pump 6. piped into toilet and kitchen 7.borehole (commercial) 8.borehole (private) 9. commercial tanker 10. bottle water/ sachet (pure) water)
X_2 = Source of cooking water (1. river/steam 2. Well 3. rain water 4. public pipe-borne water 5. mono pump 6.piped into toilets and kitchen 7.Borehole (commercial) 8. Borehole (private) 9. commercial tanker)
X_4 = Average time to fetch water (1. Piped supply, 2. Less than 15 minutes, 3. 15-30minutes, 4.31-60 minutes, 5 more than an hour)
X_4 = Piped (1. Piped, 2. otherwise)
X_5 = Time to fetched enough water for household/day (1. Piped supply, 2. less than 30minutes, 3. 31-60minutes, 4. 1-2 hours, 5. More than two hours)
X_6 = Who fetches water for the household (1. Adult women, 2. Adult women and children, 3. Adult men, 4. Children, 5. Any member of the household)
X_7 = Do you do anything to make the water safer (1. Yes, 2. No)
X_8 = Type of Toilet facility (1.water closet, 2. pour flush, 3.pit latrine, 4. hung flush, 5.open defecation (bush), 6.disposal with waste)
X_9 = Shared toilet Facilities (1. Yes 2. No)
X_{10} = Number of Households that shared the toilet (1. Less than five, 2. More than 10)
X_{11} = Hand wash after using the toilet (1. Yes, 2. No)
X_{12} = Hand wash with soap and water (1. Yes, 2. No, 3. at times)

3. RESULTS

3.1 The Socioeconomic Characteristics of the Respondents

According to Table1 below, the women in the study area indicated their willingness to participate in the survey when compared to the men, with the women having 50(100%) and the men 0(0%) participation. The total number of respondents interviewed were fifty (50) with equal distribution of respondents within the community having ten (10) respondents from each community where the survey was conducted which includes (Alakahia, Eliozu, Rumuosi, Rumuokoro and Choba). The household head were mostly male having 30(60.0%) male and 20(40.0%) female. The household size of the respondents indicated that majority of the respondents were 42(84%) within the range of one (1) to five (5) and the other 8(16%) of the respondents 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 was 43 with half of the respondents cumulatively within 21-30 and 31-40 years of age having 12(24%) and 13(26%) respectively. The native languages were 5(10%) Yoruba, 16(32%) Igbo, while others 29(58%) were made up of Ikwerre, Urobo, Kalabari Efik, Tiv, and Ogoni. Majority 31(62.0%) of the respondents were married, singles were 14(28%) while the widows, separated were 3(6%) and 2(4%) respectively. Few 4(8%) of the respondents had no education, 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 37(74%) of the respondents were not into farming, while the rest of the respondents 13(26%) were 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.

3.2 The Environmental Health Conditions of the Respondents

In Table 2, few 9(18%) of the respondents had the source of drinking water piped into the kitchen, borehole within the compound was 18(36%) and bottle water/pure water was 23(46%) which signifies for the majority of the respondents. The source of water for cooking were mainly piped into the kitchen which was 28(56%) and borehole (Private) 22(44%) which were 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, while 4(8%) of the respondents were able to fetch water within fifteen (15) to thirty (30) minutes, 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 15(30%) had to go less than thirty (30) minutes and 7(14%) used 31-60 minutes and respectively. Those households that do not have water piped into their kitchen and bathroom had majority 13(26%) of the adult women fetch water, with 6(12%) of the adult women and children being the ones to fetch water in the household, and few 3(6%) of the respondents had their children being the only ones that fetches 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 which were 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 48(96%) of the respondents 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. Three 3(6%) of respondent had babies they fed with their hands 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 1. The socioeconomic characteristic of the respondents

Socio-Economic Characteristics	Frequency (50)	Percentage	Mean
Sex			
Female	50	100	
Male	0	0	
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	43

Socio-Economic Characteristics	Frequency (50)	Percentage	Mean
31-40	13	26.0	
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

Table 2. Environmental health conditions of the respondents

WASH	Frequency (50)	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

WASH	Frequency (50)	Percentage
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, indicated none of the respondents 19(38%) had diseases related to WASH. While the remaining respondents that had diseases related to WASH were 6(12%) Cholera, 10(20%) Diarrhoea, Typhoid malaria occurred in 13(26%) of the respondents while Skin Infection and COVID-19 were 1(2%) each.

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.

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 WASH diseases 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 relationship between time to fetch enough water for household per day and 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 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 WASH 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 significance. Hand washing with soap and water had a positive relationship with WASH diseases prevalence with 0.05 level of significance.

4. DISCUSSION

According to a study conducted in one of the developing countries it was noted that majority of the respondents had their source of water for drinking and cooking from deep tube well and pond [12]. correspondingly the source of drinking water for the respondents in the study area (Obio-Akpor) includes piped water into the kitchen, borehole within the compound and bottle water/pure water, while the source of water for cooking were mainly piped into the kitchen and majority of the respondents have their borehole (Private) with in the compound, or fetch from the neighbours' compound, this is contrary to the study conducted for the entirety of developing countries in the past, this indicates an improvement in the study area. It was common among the respondents not to take any additional measures in making the water safer except for a few. The few respondents that keep their water safe were boiling and using water guard, this is contrary to the study done in the North-western part of Nigeria by Sridhar Okareh and Mustapha [13] where it was indicated that majority of the respondents treated the water before using. The women and children in the study area were responsible for fetching of water, which was in accordance with the study done by WHO across sixty-one 61 countries indicating women were primarily fetching water for the family [14]. More than half of the respondents in Obio-Akpor uses a water closet directly, while others uses pour and flush. Less than five (5) households shares a toilet, very few of the respondents has to share the toilet with more than ten households while others do not share toilet with other households. Most of the respondents wash their hands which indicates a good hygiene behaviour, especially with soap and water, which was in line with the sustainable development goal (SDG) targets, in target 6.2, the percentage of population using safely managed sanitation services, including a hand washing facility with soap and water [15]. Few respondents with babies wash their hands before feeding them which is important in reducing the risking of infecting the baby with any of the WASH disease, this indicates the respondents has knowledge on personal hygiene, while these was 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 before feeding a child, before preparing food for the family and before eating [16]. Majority of the respondents are aware of water sanitation and hygiene (WASH) diseases such as cholera, Typhoid fever and diarrheal, among other diseases indicated by the respondents. Few of the respondents had none of the diseases related to WASH in the past 12months, while the remaining respondents had Cholera, Diarrhoea, Typhoid malaria, Skin Infection and COVID-19, this shows there were improvement when compared to previous findings by Prüss-Ustün et al. [17], indicating the leading cause of death was one of the WASH disease.

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

Diseases related to WASH	Frequency (50)	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

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

Prevalence of WASH disease	Frequency (50)	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%

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 or otherwise	-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%)*

Considering WASH diseases prevalence among the respondents, There was a negative relationship between the average time to fetch water and the Prevalence of WASH diseases, 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, this is also relevant to the study done by Guy and Claire (2017); Pickering and Davis [18], whereby it was stated that reduction in time required to fetch water is associated with less prevalence of diarrhea. Though, there was a medium correlation which was significant at 0.01 level of significance. 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, this might bring about a decrease in the prevalence of WASH diseases with 0.01 level of significance, though there was a negative relationship between time to fetch enough water for household per day and prevalence of WASH diseases, 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, this was in line with the Studies documented, indicating higher rates of diarrheal disease and gastrointestinal infection in schools that where deprived of a better-quality drinking water and sanitation facilities [19]. A decrease in the poor state 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, when there is a decrease in the the poor state of toilet facilities, it might bring about discretion, relief, and accessibility benefits are magnified for vulnerable groups, incapacitated chronic illness Guy and Claire [20]. 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, this findings is in accordance with a study in six (6) countries of South-East Asia, the rural households that owned their own latrine saved up 4 to 20 minutes of travel time per trip bring about less susceptibility to sanitary related diseases, with ease of going about their sanitary activity [21]. 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 with soap, there would be an increase in the prevalence of WASH diseases, notably the correlation is weak with 0.05 level of significance, this resonates with the study done by Nicholson, et. al. [22], which indicated the importance of using soap and water in washing the hands leading to the evaluations of Public-Private Partnership for Hand washing (PPPHWs) being commissioned by private soap industries and were involved in providing free soap to families.

5. CONCLUSION AND RECOMMENDATIONS

This study indicated 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, and hand washing after using the toilet) were significant at 0.01 level of significance in correlation to the dependent variable Prevalence WASH diseases. Therefore, it is 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.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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