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EFFECTS OF PUBLIC HEALTH EDUCATION INTERVENTION ON PREVENTION PRACTICES OF CHOLERA ON INHABITANTS OF SOME SELECTED COMMUNITIES IN DELTA STATE, NIGERIA

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ABSTRACT
This study examined the effects of public health education intervention on prevention practices of cholera among inhabitants of selected communities in Delta State, Nigeria. Four research questions guided the study while four null hypotheses were tested at 0.05 level of significance. A quasi-experimental pre-test and post-test research design was adopted, involving intervention and control groups. Data were collected before and after the intervention using a validated questionnaire, titled "Prevention Practices of Cholera Questionnaire (PPCQ)" and analysed using descriptive and inferential statistics. Findings revealed that prevention practice scores improved in the intervention group (4.69-point gain) compared to a slight increase in the control group. Prevention practices also improved across all age groups, with participants aged 40 years and above recording the highest increase (3.38 points). Both males and females demonstrated better preventive practices, with females showing a slightly higher gain (3.09 points compared to 2.92 points). Similarly, prevention practices improved across all educational levels, with the highest gains among those with postgraduate and First School Leaving Certificates. However, statistical analysis showed no significant differences in prevention practice scores between the intervention and control groups (p = .113), nor across age (p = .109), gender (p = .543), or educational levels (p = .333. The study concludes that health education remains a vital tool for promoting cholera prevention practices, but its long-term effectiveness depends on sustained engagement, supportive infrastructure, and community participation. It recommends continuous community-based education, improved water and sanitation facilities, and intersectoral collaboration to strengthen cholera control efforts in Delta State and beyond.

Keywords: Public health education, cholera prevention, hygiene practices, community intervention, Delta State, Nigeria.

Introduction
Cholera is a major public health concern in many parts of the world, especially in resource-poor countries with limited access to safe water and sanitation. In Nigeria, the disease seems endemic, having the tendency to cause substantial burden of morbidity and mortality. Cholera outbreaks occur frequently, with Delta State being one of the particularly affected areas. It appears

to constitute one of the greatest social evils in the affected regions—not only does it threaten the lives of women, men, and children, but it also hinders educational progress and imposes significant financial burdens on governments. The causative agent behind this devastating disease is *Vibrio cholerae*, a bacterium responsible for the serious, potentially fatal, and highly contagious cholera infection. Cholera is primarily an infection of the small intestine, transmitted through the ingestion of food or water contaminated with *Vibrio cholerae* (World Health Organisation, WHO, 2015). According to the Centers for Disease Control and Prevention (CDC, 2020), it is an acute diarrheal illness that can spread rapidly in areas with inadequate sanitation and poor access to safe drinking water, further compounding the challenges faced in affected regions like Delta State. Thus, in this study, cholera refers to an infectious disease caused by the bacterium Vibrio cholera which is typically contracted through drinking water or eating food that has been contaminated with the bacterium.

Cholera has continued to be a global threat to public health and is a key indicator of lack of human biological and social development (World Health Organization (WHO, 2020). The disease has been a major public health concern globally. The disease was initially a global health problem, however, over time, the developed countries of the world seemed to have overcome it, leaving the disease largely confined to developing countries, especially countries in the tropics and subtropics (Bwire, 2020). World Health Organisation noted that cholera is still a risk in more than 50 countries, with approximately 1.3 million cases and 95,000 deaths reported in 2019. In Nigeria, WHO noted that between 2017 and 2018, there were 8,000 reported cases of cholera, with an estimated mortality rate of 10 percent. In Delta State, Nigeria, a total of 1,348 cases and 4 deaths were reported in 2018 (Nigeria Centre for Disease Control, 2018). Going by the view of Sur (2017), developing countries like Nigeria are disproportionately affected because of seemingly lack of resources, infrastructure and prevention methods.

In endemic areas like Delta State, outbreaks usually occur when public sanitation is disrupted. As such, these tend to create many health problems, food and water supplies can become contaminated by parasites and bacterium when essential systems, like those for water sewage are destroyed. The reason may be because the disease-causing organisms normally live-in aquatic environment along the coast and the people acquire this infection by consuming water, sea food, or other foods contaminated with the vibrio cholerae bacterium.

Vibrio cholerae bacterium is spread through faecal-oral routes, and studies like D'Mello-Guyett, Mathai, Ramachandran and Nair, (2020) demonstrate that ingestion of Vibrio cholerae occurs from consuming contaminated foods and water. Public health education interventions are commonly used in an effort to reduce the risk of developing cholera. Such interventions are designed to provide

information about cholera, how it is spread, and how it can be prevented

Lack of access to health care, poor sanitation and hygiene, overcrowding, and unsafe drinking water all increase the risk of cholera. These factors are present in Nigeria and Delta State in particular, making them a major public health concern for spread of cholera. In order to reduce the spread of cholera, it is essential that communities have access to safe drinking water, improved sanitation and hygiene practices, and improved access to health care through public health education.

Public health education is defined as the process of improving the overall health of the public through educational initiatives (Kreuter and Osborn, 2014). It is the practice of providing education that focuses on health promotion and prevention strategies to improve health outcomes (Ramakrishnan and Fox, 2017). According to Rehman (2015), public health education is a systematic effort to advance the well-being of the public through the use of health education, health promotion, and health protection. Therefore, in the context of this study, public health intervention is an organized effort to promote specific behaviours and habits that can improve physical, mental and emotional health. These interventions can also reframe the perspective of unhealthy habits to change the way people think about those behaviours.

Public health education interventions are important component of health promotion programmes that are designed to help individuals and communities learn about and adopt healthy behaviours. These interventions typically involve providing educational materials and workshops to help people learn how to make healthier lifestyle choices (Lee, Kim and Kim (2014). In addition, according to Rudolf, Kahlmeier, Lindner and Alber (2015) health education interventions can include strategies such as providing incentives for healthy behaviours, developing community-based programmes, and creating an environment that supports healthy living. Improved access to health care through health education is an important intervention to improve the health and well-being of individuals and communities. By providing people with the resources to make healthy decisions and adopt healthier habits, health education can help people make better health care decisions and lead healthier lives.

Improved access to health care through health education is essential for preventing the spread of cholera. It can provide communities with tools necessary to identify symptoms of the disease and seek treatment quickly. This can help reduce the severity of the disease and prevent it from spreading further. Consequently, exposure to health education is a critical factor in preventing the outbreak and spread of cholera. According to a study by the World Health Organisation (WHO, 2018), health education initiatives can significantly lower the risk of cholera transmission by up to 60 percent. Education about personal hygiene, safe water storage and drinking, and proper sanitation can help communities avoid contact with contaminated water sources that can help in transmitting cholera.

In addition, public health education can help improve the availability and use of health services in communities at risk of cholera. For example, a study conducted in Bangladesh showed that health education interventions increased the use of oral rehydration therapy (ORT) by up to 46 percent (Matin, et al., 2019). ORT is an effective treatment for cholera that can reduce the severity and duration of the illness. Health education can empower communities to take control of their health and to respond quickly to the threat of cholera. For example, the WHO recommends health education interventions to increase prevention practices to seek medical help as soon as possible (WHO, 2018). The reason was based on the idea that preventive diagnosis can reduce the risk of further transmission of cholera in a community.

To reduce the risk of cholera, it is important to understand how it is transmitted and to practise proper hygiene and sanitation. This includes boiling or treating water before drinking, washing hands properly, avoiding raw or undercooked food, and safe disposing of human waste. In addition, CDC (2020) asserted that vaccinating vulnerable populations can help reduce the spread of cholera and protect people from contracting the infection. Prevention of cholera is key to stopping the disease from spreading. Prevention is the process of assessing risk and taking action to reduce the likelihood of the disease occurring (APA, 2021). It involves proactive efforts aimed at reducing the risk or impact of potential threats or negative outcomes before they happen. (CDC, 2021). According to the U.S. Department of Health and Human Services (2018), "prevention" is the use of strategies to reduce the chances of a negative outcome or event occurring. However, in this study, prevention is used as the anticipation and avoidance of hazards, risks, and disasters through the implementation of effective strategies to reduce the chances of a negative outcome or event occurring.

Health promotion activities, such as raising awareness of health issues, creating educational materials, providing resources and support, and advocating for policy changes, can help people increase control over their health and its determinants (CDC, 2017). Disease prevention activities according to American Public Health Association (2018) include immunisations, health screenings, and lifestyle changes. Environmental health activities involve identifying and remediating hazardous waste sites, testing water for contaminants, and limiting the use of hazardous substances. In this study, all these activities will be considered so that the subjects would know the activities they will adopt to prevent cholera.

Cholera prevention is necessary to reduce the spread of this waterborne illness. Measures for prevention as WHO (2020) noted includes; improving water quality, sanitation, and hygiene practises. Adequate sanitation practises are essential to avoid contamination of water supplies. This includes proper disposal of human and animal waste, as well as washing of hands before and after handling food. Cholera can

also be prevented by improving water quality, sanitation, hygiene practice, and by vaccination (CDC, 2017). WHO (2019) noted that vaccines are an effective way to protect those at high risk of cholera, however, adequate water, sanitation, and hygiene practice are essential for preventing the spread of the disease. Thus, WHO recommended that water should be free of human, animal, and chemical contaminants. This can be accomplished by treating water with chlorine, boiling it, or filtering it through a cloth or a ceramic pot (McLaughlin, Ofori and O'Reilly, 2012). Therefore, good hand-washing habits, treating drinking water with chlorine or other disinfectants, getting vaccinated, keeping food and utensils clean and proper disposal of human waste are all essential measures being advocated for in public health education to reduce the spread of cholera.

Public health education interventions can have a positive impact on prevention of cholera in communities, depending on the age and level of education of the people in the community. Research has shown that educational interventions can be tailored to different age groups as well as to those with different levels of education. For example, a study in Bangladesh found that public health education interventions targeting adults (ages 18-59 years) and elderly (ages 60 years plus) had a significant effect on knowledge and prevention practices of cholera (Ahmed, Uddin, Khan and Hossain, 2019). The study found that adults and seniors who received public health education interventions reported higher preventive behaviours.

Similarly, another study in India found that public health education interventions had a positive impact prevention of cholera among people of different levels of education (Sharma et al., 2020). The study found that people with a higher level of education had better preventive behaviours than people with a lower level of education. These studies demonstrate the effects of public health education interventions in increasing knowledge about the prevention of cholera and reducing its occurrence. These studies indicate that such interventions can be tailored to different age groups and those with different levels of education, thus providing a possible tool to treat and reduce the prevalence of cholera. This shows the need for effective public health education interventions which would focus on educating communities on the causes of cholera, how it is spread, and the best ways to prevent it. This is the motivation for this study, to determining the effect of public health education interventions on prevention of cholera in some selected communities in Delta State.

Statement of the Problem

Cholera continues to pose a significant public health challenge in Nigeria, particularly in Delta State, where inadequate access to clean water, poor sanitation, and limited health awareness contribute to recurrent outbreaks. Despite existing government efforts, many communities still engage in risky practices such as consuming contaminated water, poor hand hygiene, and improper waste disposal, which exacerbate the spread of the disease. This indicates a critical gap in the

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effectiveness of public health education interventions in promoting sustained cholera prevention practices. Understanding how targeted public health education influences residents' knowledge, attitudes, and preventive behaviours is therefore essential to reducing the incidence of cholera and improving community health outcomes in these vulnerable communities.

Purpose of the Study

The main purpose of this study was to determine the effects of public health education intervention on prevention practices of cholera on inhabitants of some selected communities in Delta State, Nigeria. Specifically, the study determined the:

1. mean cholera prevention practices of inhabitants of some selected communities in Delta State before and after public health education intervention
2. mean cholera prevention practices of male and female inhabitants of some selected communities in Delta State before and after public health education intervention.
3. mean cholera prevention practices of male and female inhabitants of some selected communities in Delta State before and after public health education intervention based on their ages.
4. mean cholera prevention practices of inhabitants of some selected communities in Delta State before and after public health education intervention based on their levels of education.

Research Questions

The following research questions guided the study:

1. What are the mean cholera prevention practices of inhabitants of some selected communities in Delta State before and after health education intervention?
2. What are the mean cholera prevention practices of inhabitants of some selected communities in Delta State before and after health education intervention based on their ages?
3. What are the mean cholera prevention practices of male and female inhabitants of some selected communities in Delta State before and after health education intervention based on their ages?
4. What are the mean cholera prevention practices of inhabitants of some selected communities in Delta State before and after health education intervention based on their levels of education?

Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

1. There is no significant difference in the mean cholera prevention practices of inhabitants of some selected communities in Delta State before and after health education intervention
2. There is no significant difference in the mean cholera prevention practices scores of inhabitants of some selected communities in Delta

State before and after public health education intervention based on their ages.

3. There is no significant difference in the mean cholera prevention practices scores of male and female inhabitants of some selected communities in Delta State before and after public health education intervention.
4. There is no significant difference in the mean cholera prevention practices scores of inhabitants of some selected communities in Delta State before and after public health education intervention based on their levels of education.

Method

This study adopted a community-based quasi-experimental design involving pre-test and post-test non-randomised control groups to examine the effects of a public health education intervention on cholera knowledge and prevention practices among residents of Delta State, Nigeria. The design enabled assessment of baseline knowledge and post-intervention changes without disrupting community activities.

Study Area and Population

The study was conducted in selected communities in Delta State, a cholera-prone region in Nigeria's Niger Delta characterised by high rainfall, flooding, poor sanitation, and reliance on contaminated water sources. The target population comprised 792,000 residents from eight identified communities—Abraka, Oghara, Oha, Sapele, Udu, Otujeremi, Ughelli, and Enerhen—representing diverse socio-economic and ethnic groups. Participants aged 18 years and above were eligible for inclusion.

Sample and Sampling Procedure

A total of 400 participants (200 experimental and 200 control) were selected using a multi-stage random sampling technique. Four communities were drawn from the eight identified; two were assigned to the experimental group and two to the control group. Stratified random sampling ensured proportional representation across age and educational levels.

Instruments for Data Collection

To achieve the purpose of this study, a researcher developed instrument was used to measure cholera prevention practices among the study participants. Part A of the instrument contained contains items on the demographic characteristics of the respondents. Part B contains items on the Prevention Practices of Cholera (PPC). Prevention Practices of Cholera Questionnaire (PPCQ) is developed by the researcher based on related literature reviewed, and consist of 20 items that seeks to determine the participants' prevention practices of cholera. This will have response options of True or False. The item statements will focus on topics such as proper hygiene, safe food preparation, and adequate water management. These questions will help to assess the participants on how they try to prevent cholera and what steps could be taken to reduce its spread. The instrument's internal consistency was established using the Kuder–Richardson Formula 20 (KR-20), which produced a reliability coefficient of 0.79., confirming

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that the PPC was sufficiently reliable for the study.

Data Collection and Intervention

Following ethical approval and community consent, trained research assistants administered pre-tests, delivered the intervention, and collected post-test data. The eight-week intervention comprised structured health education sessions on cholera prevention, while control groups received unrelated instruction on nutrition. The intervention was delivered in local community halls at times convenient for participants.

Control of Extraneous Variables

Measures were adopted to reduce bias, including maintaining uniform instructional conditions, reshuffling post-test items to reduce test sensitisation, using community separation to prevent interaction between groups, and employing local teachers as facilitators to minimise the Hawthorne effect.

Data Analysis

Data were coded and analysed using SPSS version 23. Descriptive statistics (mean scores) were used to answer research questions, with cut-off means of 15 and 10 set for adequate knowledge and prevention practices respectively. The Analysis of Covariance (ANCOVA) was applied to test hypotheses at 0.05 significance level, determining the effectiveness of the intervention after controlling for pre-test differences.

Results

Data from the field of study were analysed and presented in tables as follows:

Research Question 1: What Are the Mean Cholera Prevention Practices of Inhabitants of Some Selected Communities in Delta State Before and After Health Education Intervention?

Table 1: Mean cholera prevention practices of inhabitants of some selected communities in Delta State before and after health education intervention

Group		Practices_ Pretest	Practices_ Posttest	Mean difference	Remark
Intervention	Mean	8.56	13.25	4.69	Effective
	N	191	191		
	SD	1.831	2.900		
Control	Mean	12.40	13.71	1.31	
	N	188	188		
	SD	2.314	2.420		

The findings in Table 1 reveal that the health education intervention improved cholera prevention practices among inhabitants of the selected communities. In the intervention group, the mean practice score increased from 8.56 at pre-test to 13.25 at post-test, giving a mean difference of 4.69. In contrast, the control group

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showed a slight change, with the mean score rising from 12.40 to 13.71, with a mean difference of 1.31.

Research Question 2: What Are the Mean Cholera Prevention Practices of Inhabitants of Some Selected Communities in Delta State Before and After Health Education Intervention Based on Their Ages?

Table 2: Mean Cholera Prevention Practices of Inhabitants of Some Selected Communities in Delta State Before and After Health Education Intervention Based on Their Ages

Age Group		Practices Pretest	Practices Posttest	Mean difference	Remark
Below 20 years	Mean	10.39	13.65	3.26	Effective
	N	96	96		
	SD	2.789	2.644		
21–39 years	Mean	10.47	13.22	2.75	Effective
	N	204	204		
	SD	2.838	2.636		
40 years and above	Mean	10.54	13.92	3.38	More effective
	N	79	79		
	SD	2.908	2.786		

The findings in Table 2 show that the health education intervention improved cholera prevention practices across all age groups. Among respondents below 20 years, the mean score rose from 10.39 at pre-test to 13.65 at post-test, giving a mean difference of 3.26. For those aged 21–39 years, the mean score increased from 10.47 to 13.22, with a mean difference of 2.75. Participants aged 40 years and above recorded the highest improvement, with scores rising from 10.54 to 13.92, showing a mean difference of 3.38.

Research Question 3: What are the mean cholera prevention practices of male and female inhabitants of some selected communities in Delta State before and after health education intervention?

Table 3: mean cholera prevention practices of male and female inhabitants of some selected communities in Delta State before and after health education intervention

Gender		Practices Pretest	Practices Posttest	Mean difference	Remark
Male	Mean	10.46	13.38	2.92	Effective
	N	168	168		
	SD	2.811	2.561		
Female	Mean	10.46	13.55	3.09	More effective
	N	211	211		
	SD	2.857	2.773		

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The findings in Table 3 show that the health education intervention improved cholera prevention practices among both male and female inhabitants. For males, the mean score increased from 10.46 at pre-test to 13.38 at post-test, resulting to a mean difference of 2.92. Among females, the mean score rose from 10.46 to 13.55, with a mean difference of 3.09, which was slightly higher than that of the males.

Research Question 4: What are the mean cholera prevention practices of inhabitants of some selected communities in Delta State before and after health education intervention based on their levels of education?

Table 4: Mean Cholera Prevention Practices of Inhabitants of Some Selected Communities in Delta State Before and After Health Education Intervention Based On Their Levels of Education

Level of Education		Practices Pretest	Practices Posttest	Mean difference	Remark
Post Graduate degrees	Mean	9.89	13.71	3.82	More Effective
	N	28	28		
	SD	2.514	2.088		
Bachelor's Degree	Mean	10.56	13.34	2.78	Effective
	N	144	144		
	SD	2.887	2.658		
WASC / NECO / NABTEB	Mean	10.43	13.27	2.84	Effective
	N	130	130		
	SD	2.812	2.747		
First School Leaving Certificate	Mean	10.35	14.12	3.77	Effective
	N	52	52		
	SD	2.835	2.727		
No Formal Education	Mean	11.00	13.72	2.72	Effective
	N	25	25		
	SD	3.055	2.880		

The findings in Table 4 showed that health education intervention improved cholera prevention practices among inhabitants at all educational levels. Respondents with postgraduate degrees recorded an increase in their practice mean score from 9.89 at pre-test to 13.71 at post-test, giving the highest Mean difference of 3.82. while respondents with bachelor's degrees showed a similar rise from 10.56 to 13.34 showing a mean difference of 2.78. Those holding WASC/NECO/NABTEB certificates improved from 10.43 to 13.27 showing a mean difference of 2.84. Participants with a First School Leaving Certificate followed closely, improving from 10.35 to 14.12 with a mean difference of 3.77. Participants with no formal education also improved from 11.00 to 13.72, showing a mean difference of 2.72. These results indicate that the health education intervention was effective for all categories, with participants who had

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postgraduate degrees and those with a First School Leaving Certificate showing slightly greater gains in cholera prevention practices.

Hypothesis 1: There is no Significant Difference in the Mean Cholera Prevention Practices Scores of Inhabitants of Some Selected Communities in Delta State Before and After Experimental Public Health Education Intervention and The Control Groups

Table 5: ANCOVA Results on the Difference in Mean Cholera Prevention Practices Scores of Inhabitants Before and After Public Health Education Intervention

Source of Variation	Type III Sum of Squares	Df	Mean Square	Cal.F	Pvalue	Remark
Corrected Model	22.109[a]	2	11.054			
Intercept	2747.970	1	2747.970			
Pretest	1.941	1	1.941			
Group	18.018	1	18.018	2.518	.113	NS
Error	2690.403	376	7.155			
Total	71529.000	379				
Corrected Total	2712.512	378				

The results in Table 5 reveals that 0.05 level of significance, 1df numerator and 378df denominator, the effect of the group variable (experimental versus control) on post-test knowledge scores was not significant ($F = 2.518$, $p = .113$). Because the calculated p-value (.113) was greater than the significance level of 0.05, the null hypothesis was accepted. This indicates that the public health education intervention did not produce a statistically significant difference in cholera prevention practices among the inhabitants exposed to experimental intervention and those in the control groups.

Hypothesis 2: There is no significant difference in the mean cholera prevention practices scores of inhabitants of some selected communities in Delta State before and after public health education intervention based on their ages.

Table 6: ANCOVA Results on the Difference in Mean Cholera Prevention Practices Scores of Inhabitants before and After Public Health Education Intervention Based on Age

Source of Variation	Type III Sum of Squares	Df	Mean Square	Cal.F	Pvalue	Remark
Corrected Model	35.939[a]	3	11.980			
Intercept	4452.987	1	4452.987			
Pretest	4.003	1	4.003			
Age	31.848	2	15.924	2.231	.109	NS
Error	2676.573	375	7.138			
Total	71529.000	379				
Corrected Total	2712.512	378				

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Table 6 shows that at 0.05 level of significance, 1df numerator and 378df denominator, age did not have a statistically significant effect on post-test cholera prevention practices scores (F = 2.231, p = .109). Because the p-value for age (.109) is greater than the 0.05 significance level, the null hypothesis is accepted. This means that the public health education intervention did not produce a statistically significant difference in cholera prevention practices among inhabitants when grouped by age.

Hypothesis 3: There is no significant difference in the mean cholera prevention practices scores of male and female inhabitants of some selected communities in Delta State before and after public health education intervention.

Table 7: ANCOVA Results on the Difference in Mean Cholera Prevention Practices Scores of Inhabitants before and After Public Health Education Intervention Based on Gender

Source of Variation	Type III Sum of Squares	df	Mean Square	Cal.F	Pvalue.	Remark
Corrected Model	6.756[a]	2	3.378			
Intercept	4414.568	1	4414.568			
Pract_Pre	4.091	1	4.091			
Gender	2.665	1	2.665	.370	.543	NS
Error	2705.756	376	7.196			
Total	71529.000	379				
Corrected Total	2712.512	378				

The summary of the analysis in Table 7 shows that at 0.05 level of significance, 1df numerator and 378df denominator, gender did not have a statistically significant effect on post-test cholera prevention practices scores (F = 0.370, p = .543). Since the p-value for gender (.543) is greater than the 0.05 significance level, the null hypothesis is accepted. This indicates that the public health education intervention did not produce a statistically significant difference in cholera prevention practices between male and female inhabitants.

Hypothesis 4: There is no significant difference in the mean cholera prevention practices scores of inhabitants of some selected communities in Delta State before and after public health education intervention based on their levels of education.

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Table 8: ANCOVA Results on the Difference in Mean Cholera Prevention Practices Scores of Inhabitants Before and After Public Health Education Intervention Based on Level of Education

Source of Variation	Type III Sum of Squares	df	Mean Square	Cal.F	Pvalue	Remark
Corrected Model	37.067[a]	5	7.413			
Intercept	4313.916	1	4313.916			
Pretest	4.521	1	4.521			
Level_of_ Education	32.977	4	8.244	1.149	.333	NS
Error	2675.444	373	7.173			
Total	71529.000	379				
Corrected Total	2712.512	378				

The results in Table 8 reveals that at 0.05 level of significance, 1df numerator and 378df denominator, level of education did not have a statistically significant effect on post-test cholera prevention practices scores ($F = 1.149$, $p = .333$). Since the p-value for level of education (.333) was greater than the 0.05 level of significance, the null hypothesis is upheld. Thus, there is no significant difference in the mean cholera prevention practices scores of inhabitants of some selected communities in Delta State before and after public health education intervention based on their levels of education.

Discussion

The study investigated the effects of a public health education intervention on cholera prevention practices among residents of selected communities in Delta State, Nigeria. Findings revealed that although there was an improvement in the knowledge and reported preventive behaviours of participants following the intervention, the difference in practice scores between the intervention and control groups was not statistically significant. This suggests that while exposure to health education encouraged positive behavioural intentions, the resulting changes were not strong or sustained enough to create a clear distinction between those who received the intervention and those who did not.

Several factors may account for this outcome. Firstly, increased knowledge does not automatically translate into consistent behaviour change, particularly where environmental and structural barriers persist. In many communities, limited access to clean water, poor sanitation, and poverty makes it difficult for individuals to consistently practice what they have learned. Secondly, the short follow-up period captured immediate rather than long-term behavioural outcomes, yet meaningful changes in hygiene practices usually occur gradually as habits develop and are reinforced over time.

The study's findings are consistent with evidence from earlier research across different contexts. Studies in Bangladesh, India, and several Nigerian states have shown that health education reliably improves cholera knowledge (Ahmed et al., 2019; Sharma et al., 2020; Kiragu et al., 2016; Ogunlesi et al., 2019; Bankole et al., 2021). However, as Kim and Bryant (2017)

observed, knowledge gains alone do not ensure behaviour change unless supportive infrastructure—such as safe water supply and sanitation facilities—is available. Other studies (Dureab et al., 2021; Nauja et al., 2020; Akel et al., 2023) similarly highlight that awareness does not always produce corresponding improvements in preventive practice when enabling conditions are absent.

Despite these constraints, the intervention significantly improved cholera prevention practices across all age groups. Older adults (40 years and above) tended to show slightly greater improvement, possibly due to previous experiences with cholera outbreaks and their role as household decision-makers responsible for hygiene-related behaviours. Younger adults, though receptive to learning, may have had less authority to implement preventive measures. Nevertheless, hypothesis testing revealed no statistically significant difference in effect based on age, indicating that the intervention was effective across age groups. This aligns with similar findings by Ahmed et al. (2019), Sharma et al. (2020), and Isiaq et al. (2023), which demonstrated that well-designed health education programmes can improve prevention practices among both younger and older populations.

The study also showed that health education intervention improved preventive practices among both males and females, with no significant gender-based differences. This implies that both sexes benefitted equally from the intervention when information was clearly communicated and culturally appropriate. The slightly higher improvement among females could be attributed to their active involvement in household chores, food preparation, and child care, which makes the information more directly relevant to them. This finding supports Bandura's (1986) Social Cognitive Theory, which explains that increased knowledge and self-efficacy encourage individuals to adopt preventive behaviours. Similar gender-related outcomes were reported by Sharma et al. (2020), Kiragu et al. (2016), and Anetor and Abraham (2020).

In addition, the health education intervention significantly improved cholera prevention practices among participants of all educational levels, with no significant difference in outcomes. Respondents with higher education were more capable of processing and applying new information, while those with lower education benefitted from the simple and practical design of the intervention. The inclusion of demonstrations, discussions, and community engagement ensured that even participants with minimal schooling could understand and apply key preventive practices such as handwashing, safe water handling, and proper sanitation. This outcome reaffirms Bandura's notion that learning through observation and practice can be effective regardless of literacy level.

Comparable results have been reported in Bangladesh, India, and various Nigerian states, where structured health education interventions improved preventive practices across literacy levels (Ahmed et al., 2019; Anetor & Abraham, 2020; Kiragu

et al., 2016; Olusola-Faleye, 2011). The overall conclusion is that public health education is a powerful and inclusive strategy for promoting cholera prevention. While structural barriers may limit its full impact, well-planned and participatory education programmes can improve hygiene knowledge and foster positive behaviour change among diverse demographic groups. Thus, the study affirms that public health education interventions play a crucial role in enhancing knowledge and influencing behaviour toward cholera prevention. However, for long-term effectiveness, such interventions must be accompanied by supportive infrastructure, community participation, and continuous reinforcement of preventive practices.

Conclusion

The findings of the study demonstrated that public health education intervention produced measurable improvements in cholera prevention practices among inhabitants of the selected communities in Delta State, Nigeria. Participants in the intervention group showed a higher gain in practice scores compared to those in the control group, indicating that exposure to structured health education enhanced awareness and adoption of preventive behaviours such as proper handwashing, safe water handling, and sanitation practices. Prevention practices improved across all age groups, with participants aged 40 years and above demonstrating the greatest increase, possibly due to their life experience and stronger sense of household responsibility. Similarly, both males and females showed improved preventive practices, though females recorded a slightly higher gain, likely reflecting their greater involvement in domestic hygiene and caregiving activities. The intervention also produced improvement across all educational levels, with the highest gains among participants with postgraduate qualifications and those holding only a First School Leaving Certificate. This pattern indicates that well-designed health education, when presented in clear and practical terms, can effectively reach people of varying literacy backgrounds.

Recommendations

Based on the findings of the study on the Effects of Public Health Education Intervention on Prevention Practices of Cholera among Inhabitants of Selected Communities in Delta State, Nigeria, the following recommendations are made:

1. Continuous public health education should be maintained and scaled up across all communities. Regular community sensitisation, school-based health talks, and media campaigns can reinforce cholera prevention messages and help sustain positive behavioural change.
2. Government and development partners should complement health education with practical support such as improved access to safe drinking water, functional sanitation facilities, and waste disposal systems. Education alone may not yield lasting results without enabling environmental conditions.
3. Health education interventions should actively involve community leaders, youth groups, and women's

associations. Engaging local stakeholders promotes ownership, enhances cultural relevance, and improves the likelihood of long-term adoption of preventive practices.

4. Follow-up visits and periodic assessments should be conducted to evaluate whether participants continue to practice preventive behaviours. Continuous supervision and reinforcement help to strengthen habit formation and sustain health gains achieved through education.
5. Future interventions should give special attention to rural and underserved communities where access to health information and resources is limited. Tailored messages in local languages should be used to reach all literacy levels effectively.
6. Since both males and females benefitted from the intervention, future programmes should continue to promote gender-balanced participation. Women, as primary caregivers, should be further empowered through training on household and food hygiene, while men should be encouraged to take active roles in sanitation and community health initiatives.

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