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"Effects of Water Sanitation and Hygiene intervention on Cholera Prevention in Ikere Local Government Area of Ekiti State, Nigeria"

Effects of Water Sanitation and Hygiene intervention on Cholera Prevention in Ikere Local Government Area of Ekiti State, Nigeria

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Abstract

This study examined the effects of water, sanitation, and hygiene interventions on cholera prevention in Ikere Local Government Area of Ekiti State, Nigeria. Three research questions guided the study's hypotheses. A descriptive survey design was used for the study. Data were collected from a random sample of 100 people from Ikere Local Government. A questionnaire was used to collect data from the samples. Data were analysed using descriptive statistics (frequency distributions, percentages, and means) to provide a summary of wash conditions, and inferential statistics (chi-square and correlation analyses) to examine the relationships between interventions and the prevalence of cholera. Findings from the study revealed that unproven access to good drinking water reduces cholera outbreaks. The descriptive statistics showed that over 70% of the respondents agreed that they had access to good-quality water, while about 25% did not have access to good drinking water. The study revealed that a clear link between unproven water access and a clean environment is needed to reduce or eliminate cholera outbreaks. The study concluded that providing clean water and a clean environment is necessary to prevent the spread of cholera. It is therefore recommended that the government invest in water, sanitation, and hygiene education programmes and encourage community hygiene programmes to enhance community wellness and a sickness-free environment.

Key Word: Water, sanitation, hygiene intervention, cholera, Ikere local government, Ekiti state, Nigeria

Introduction

Cholera is a diarrheal disease caused by Vibrio cholera and remains a major problem in Nigeria, especially in states with inadequate sanitation and water treatment facilities. Despite significant intervention by global health services, cholera remains a major cause of killer disease in developing countries of the world, especially in sub-Saharan Africa. The disease spreads primarily through contaminated food and water, highlighting the role of hand washing in preventing outbreaks.

Aunger (2012) reported that globally, cholera remains a common public health issue, and according to the World Health Organisation (2023), it affects various countries in sub-Saharan Africa, South Asia and parts of Latin America. It was also recorded that a recent estimate indicates that over 800,000 cases of cholera were reported worldwide in 2022. This situation poses an alarming threat to the well-being and lives of individuals and must be urgently checked and prevented. Nigeria Centre for Disease Control (NCDC) (2024) reported that the cholera outbreak surged by 22% in 2024, with suspected cases rising by an alarming 2z0 percent. Kaur (2018) reported that cholera is an acute intestinal infection spread through contaminated food and water, with communities limited to access to sanitation most affected. Adedayo, Ojo, and Olatunde (2023) opined that by the end of epidemiological week 39, the

country had recorded 10,837 suspected cases and 359 deaths. According to Aldeyab (2021), the states most affected by the outbreak include Adamawa, Ebonyi, Borno, Kano, and Jigawa. Public health experts are therefore calling on communities to enhance intervention strategies and community engagement to combat this deadly disease before it spreads to other communities. WHO (2022) reported that cholera deaths increased by 71% compared to 2022.

Kordel, Ojo, and Kumar (2023) opined that inequality disproportionately affects the world's most impoverished populations. Socioeconomic factors like poverty and lack of education contribute significantly to cholera outbreaks in Nigeria. It flourishes in regions with limited access to uncontaminated water and unsanitary living conditions. Luby (2004) also found that cholera spreads efficiently where people lack adequate personal and home hygiene practices. This calls for the importance of public education in understanding the causes and prevention of the disease. McCoy (2018) identified environmental factors contributing to cholera outbreaks as poor sanitation, inadequate water, inadequate waste management, and other poor hygiene practices, which are common in rural areas.

Tarrant (2014) on water, sanitation and hygiene (WASH) reiterated that interventions are important in reducing the transmission and spread of cholera. Access to portable drinking water and sanitation will go a long way toward preventing cholera. WHO (2023) opined that communities with better access to clean water and improved sanitation amenities are free from the disease. Rahiuan, Islam, and Saha (2018) state that sanitation measures, such as the construction of proper latrines and safe waste disposal methods, will reduce the risk of faecal contamination in the environment. A good sanitation strategy will also help reduce the spread of cholera.

Purpose of the Study

The purpose of the study is to examine the effects of water, sanitation, and hygiene (WASH) interventions on cholera prevention in Ikere Local Government Area of Ekiti State.

Research Questions

The following research questions are reused for the study:

1. What is the current status of water supply and sanitation in Ikere Local Government?
2. What hygiene practices are community members following to prevent cholera outbreaks in Ikere Local Government?
3. Is there a significant relationship between the water supply and sanitation facilities in the Ikere Local Government Area of Ekiti State?

Hypotheses

Three hypotheses reused for the study are:

Hypothesis 1: There is no significant difference in the current status of water supply and sanitation between men and women in Ikere Local Government Area of Ekiti State

Hypothesis 2: There is no significant relationship between knowledge of hygiene practices and hand washing behaviour among residents in Ikere Local Government Area of Ekiti State.

Hypothesis 3: Availability of sanitation facilities does not significantly affect the prevalence of Cholera outbreaks in Ikere Local Government Area of Ekiti State.

Review of Related Literature

Concept of Cholera

Müller (2021) defines cholera as a serious, often life-threatening diarrheal disease caused by the bacterium *Vibrio cholerae*. It is characterised by severe diarrhoea and dehydration, which, if left untreated, can lead to rapid and severe health complications, including death. Understanding cholera involves examining its definition, transmission dynamics, and prevention strategies, with a focus on sanitation and hygiene practices, including hand washing. Cholera is an acute diarrheal disease that primarily affects the gastrointestinal system. The disease is caused by the ingestion of food or water contaminated with the bacterium *Vibrio cholerae*. The hallmark symptoms of cholera include profuse, watery diarrhoea and vomiting, which can lead to severe dehydration and electrolyte imbalances. The disease can progress rapidly, with patients potentially losing up to 10 to 20 litres of fluid per day, making immediate rehydration crucial for survival (Ali, 2015).

The severity of cholera varies widely, ranging from asymptomatic or mild cases to severe illness. In severe cases, the rapid onset of watery diarrhoea and vomiting can lead to profound dehydration, hypovolemic shock, and potentially death if not treated promptly. According to the World Health Organisation (WHO), the case-fatality rate for untreated cholera can exceed 50%. Still, with timely treatment, including rehydration and antibiotics, the mortality rate can be reduced to less than 1% (WHO, 2022).

Cholera is primarily transmitted through the ingestion of water or food contaminated with *Vibrio cholerae*. The bacterium thrives in environments with inadequate sanitation and poor hygiene practices. Cholera outbreaks are often associated with the consumption of contaminated drinking water or food, particularly in areas with compromised water, sanitation and sewage disposal systems (Kumar, 2020). The bacterium can survive and multiply in aquatic environments, particularly in brackish or estuarine waters, where it can persist in biofilms on aquatic organisms or sediments. This environmental persistence increases the risk of cholera outbreaks in areas where water sources are contaminated with faecal matter. Poor sanitation and inadequate waste disposal exacerbate the spread of the disease, particularly in densely populated and low-income regions where access to clean water and sanitation facilities is limited Lipp et al., 2019).

Human-to-human transmission of cholera is uncommon; however, once infected individuals shed *Vibrio cholerae* in their faeces, they can contaminate water sources and food, thereby contributing to the spread of the disease. In areas with high transmission rates, cholera can spread rapidly within communities due to contaminated water supplies and inadequate hygiene practices (Sokhey, 2021). Recent studies and outbreak investigations provide valuable insights into the effectiveness of cholera prevention strategies. For example, during the 2010–2011 cholera outbreak in Haiti, a combination of cholera vaccination, improved water and sanitation infrastructure, and public health education contributed to a significant reduction in disease incidence (Miller, 2019). The use of oral cholera vaccines in high-risk areas was particularly effective in controlling the outbreak and preventing further spread.

Effective Strategies for Cholera Prevention

Effective cholera prevention strategies, according to Kumar (2022), are crucial for controlling cholera outbreaks and reducing disease.

Ustin (2019) opined that Sanitation improvements, especially the safe disposal of human waste, are important for cholera prevention, while Curtis (2019) opined that effective waste management systems, especially the construction of proper latrines and sewage systems, help prevent the spread of cholera outbreaks.

Hand washing with soap, according to Freeman (2014), Fewtrell (2019), and Miller (2019), is a key preventive measure for cholera Prevention. WHO (2017) and Aunger (2019) considered cholera vaccination a key strategy for preventing cholera outbreaks. This is in agreement with WHO (2017) and Kaur (2018), who stressed that effective Cholera vaccination is one of the effective strategies for Cholera prevention.

UNICEF/WHO (2020) noted that public health education will go a long way toward preventing Cholera outbreaks as awareness of the disease is raised, while Kordel (2023) found that Cholera outbreaks are common in rural areas where Public Health Education is needed most.

Sanitation as a Way of Cholera Prevention

The importance of good sanitation in society cannot be overemphasised, as good sanitation prevents outbreaks of cholera. Olumide (2021), Adedeji (2022), WHO (2023), and Adedayo (2023) emphasised that inadequate sanitation practices, such as the absence of a sewage system and open defecation, are major contributors to Cholera outbreaks in society, especially in rural areas. Good hygiene practices, especially handwashing with soap, and a clean environment at home and in public spaces, are necessary for Cholera prevention.

The study by Olumide (2025) found that communities that engaged in regular sanitation and hygiene campaigns, especially handwashing with soap and water, were free of cholera infection. The report noted that water, sanitation, and hygiene are important components of Cholera prevention.

Analysis of Research Hypotheses

Hypothesis 1*: There is no significant difference in the incidence of cholera outbreaks between people with improved access to safe drinking water and those with poor access to safe drinking water in Ikere Local Government Area of Ekiti State.*

The results in Table 4.1 indicate a significant difference between streets with good drinking water systems and those with poor drinking water ($p = 0.001$), confirming that communities with good water access experience fewer cholera outbreaks.

Table 4.1: Chi-Square Test Results for access to good and bad water

Variable	Observed Cases	Expected Cases	Chi-Square Value	P-Value
Access to good water	20	40	12.5	0.001
Access to bad water	70	50		

The chi-square test results above reveal a significant difference in cholera incidence between people with access to good water and those with access to poor water (p = 0.001). Cases of cholera among people with good water (20) were observed, compared with the expected (40), suggesting that access to good water reduces cholera outbreaks. It is also important to know that people with a bad water supply have (70) observed cases as against the expected (50). Therefore, the results show a significant difference in Cholera outbreaks between people with good water and those with bad water. As a result, null hypothesis one (Ho1) is rejected.

Hypothesis 2: *There is no significant relationship between knowledge of hygiene practices and hand washing behaviours among residents in Ikere Local Government Area of Ekiti State.*

Table 4.2: Correlation Results for Knowledge of hygiene practices and Hand washing behaviour

Variable	Correlation Coefficient (r)	P-Value
Knowledge of Hygiene practices	0.65	0.002
Frequency of Hand washing behavior		

The Pearson correlation analysis in Table 4.2 above shows a positive relationship between people's knowledge of hygiene practices and the frequency of hand washing behaviours (r = 0.65, p = 0.002). This implies that as people's knowledge of hygiene increases, hand washing practices also increase. The p-value of 0.002 indicates a significant relationship. The correlation (r = 0.65) confirms that people's knowledge improves their hygiene behaviour, especially hand washing. Therefore, the hypothesis is rejected.

Hypothesis 3: *Availability of sanitation facilities does not significantly affect the prevalence of cholera outbreaks in Ikere Local Government Area of Ekiti State.*

Table 4.3: Summary of Chi-Square result for Sanitation Facilities and Cholera outbreak

Variable	Observed Cases	Expected Cases	Chi-Square Value	P-Value
Adequate Sanitation facilities	25	40	9.8	0.003
Poor Sanitation facilities	75	60		

Table 4.3 above shows a significant relationship (p = 0.003), indicating that people with good sanitation infrastructure observed (25) cases of Cholera outbreak as against the expected cases of (40) people. In contrast, inadequate sanitation facilities were associated with a higher number of Cholera cases (75) than expected (60). These results suggest that people with good

sanitation facilities experience fewer cholera cases than those with inadequate sanitation facilities, at the 0.05 significance level. The null hypothesis 3 is therefore rejected.

Discussion of findings

The study revealed that improved access to safe drinking water significantly reduces cholera outbreaks, as shown in Table 1: 70% of respondents agreed that good water reduces cholera outbreaks, compared with the expected 50%. The results showed a significant difference in cholera outbreaks between people with good water and those with bad water. This funding aligns with global research, emphasising the critical role of water quality in preventing water-borne disease, according to the World Health Organisation (2023). The study also agreed with Ngasala (2021), who observed a 40% reduction in cholera cases in Tanzania communities with consistent access to safe drinking water. Also, Rahman's (2018) report highlighted the role of reliable water resources in reducing diarrhoeal disease. The study's findings emphasise the urgent need to address water infrastructure gaps in rural and urban areas of Ekiti State, Nigeria.

The findings from hypothesis 2 showed a positive relationship between people's knowledge of hygiene practices and the frequency of hand washing behaviours ($r = 0.65$, $p = 0.02$). This implies that as people's knowledge of hygiene increases, hand washing practices improve. From the findings, health education should be made compulsory in all Local Government Areas of Ekiti State. This finding corroborates those of Rahman, Islam and Saha (2018), who found that hygiene education campaigns increased people's knowledge and attitudes towards cholera prevention.

The report for hypothesis three, shown in Table 4, indicates a significant relationship: people with good sanitation infrastructure reported 25 cases of cholera, against the expected 40. In contrast, inadequate sanitation facilities were associated with a higher number of cholera cases (75) than expected (60). This implies that people with good sanitation facilities experience lower cholera cases than those with inadequate sanitation facilities, at the 0.05 significance level. The null hypothesis was therefore rejected. The result is in support of a study carried out by Jain, Sharma and Patel (2020), who found that open defecation practices significantly increased cholera risks in rural communities. The study by Olumide (2021) also confirmed that hygiene education on cholera prevention will go a long way toward preventing sickness and disease in society.

In conclusion, the importance of water, sanitation, and hygiene interventions for cholera prevention in any society cannot be underestimated, as the study raises awareness of the role of hygiene in preventing sickness and disease.

Therefore, the following recommendations are made to ensure the society is free from cholera and other illnesses contracted through non-hand washing before handling anything in the society.

1. Awareness creation of health education
2. Government intervention in social amenities
3. Community participation in health programmes
4. Adult education on health issues
5. Government and individuals should invest in health education.
6. The government should strengthen support for health education.
7. Cultural barriers to health issues should be addressed.

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