
ENVIRONMENTAL AND HYGIENE FACTORS AS CORRELATES OF CHOLERA PREVENTION PRACTICES AMONG ADOLESCENTS IN AKWA IBOM NORTH-EAST SENATORIAL DISTRICT, NIGERIA

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ABSTRACT

The study examined the relationship between environmental and hygiene factors as correlates of cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District, Nigeria. Two research questions were raised and hypotheses formulated and tested at .05 level of significance. The study adopted the correlational research design. The population of the study comprised all the 19,260 JS2 students in the 89 public secondary schools in the study area. A sample size of 963 JS2 students representing five percent of the study population was selected. Through a multi-stage sampling procedure, the researcher applied a systematic random sampling technique in the selection of five (5) Local Government Areas (LGAs) for the study, out of which 27 sampled schools were selected. Also, a balloting method of random sampling was used in the selection of 10 percent of JS2 students from each of the sampled school for instrument administration. The instrument for data collection was the researcher's designed questionnaire titled: "Environmental and Hygiene Factors Questionnaire (EHFQ) and Cholera Prevention Practices (CPPQ), with overall reliability coefficient of .809 obtained through Cronbach Alpha statistics. After administering the instruments, a total of 956 questionnaires were properly filled, retrieved and data coded correctly for analysis. Pearson Product Moment Correlation (PPMC) statistics was used for data analysis and the findings revealed, a very high positive and significant relationship between access to safe water, proper sewage disposal, good personal hygiene, accessibility of health facilities, community health education and cholera prevention practices among adolescent in AkwaIbom North-East Senatorial District. The findings further revealed a very

low negative and insignificant relationship between climate change, overpopulation, consumption of contaminated consumables and cholera prevention practices among adolescents in the study area. Conclusion was drawn from the findings while it was recommended among other things that public health officials should use available media channels to educate communities members on the importance of proper hygiene and sanitation practices, including hand-washing with soap and water after the toilet and before eating so as to avoid being infected with cholera.

KEYWORDS: Cholera Prevention Practices, Environmental Factors, Hygiene Factors, Safe Water Access, Sewage Disposal, Adolescents, Public Health, Water Sanitation and Hygiene.

INTRODUCTION

Cholera, an acute diarrhea infection caused by consuming contaminated food or water remains a major public health threat in many parts of the world particularly in areas facing complex emergencies. Diarrhea diseases such as cholera generally occur when water, sanitation and hygiene (WASH) services are inadequate. Cholera remains a recurrent and leading cause of disease outbreak globally, with an estimated 1.3 to 4-6 million cases and 21,000 to 143,000 death reported to annually (WHO, 2024). Also, Irena and Milena (2023) reported cholera disproportionately affects the worlds poorest and most vulnerable communities, with more than 804,721 people diagnosed of cholera and 5,805 deaths reported from 45 countries between 2023 to 2024. The European Centre for Disease Prevent and Control (ECDPC, 2025) added that since January to March 2025 a total of 76, 919 cholera cases including 969 deaths have been reported worldwide. This implies that the outbreak of cholera has affected a large number of people, demonstrating the serious nature of the situation. The disease is linked to limited access to safe water, sanitation, and prior hygiene practices.

Cholera remains a major public health challenge in Africa, particularly in Nigeria, where outbreaks occur frequently during the rainy season. Nigeria records one of the highest incidences of cholera on the continent due to factors such as inadequate water supply, poor sanitation, weak infrastructure, population displacement, and limited access to healthcare services. Cholera is a highly infectious bacterial disease caused by *Vibrio cholerae* and is primarily transmitted through contaminated water and food. The disease is characterized by severe watery diarrhea, vomiting, muscle cramps, rapid dehydration, electrolyte imbalance, and, if untreated, death. Adolescents are especially vulnerable to cholera because of their

increased risk of dehydration and exposure to unhygienic environmental conditions. Consequently, cholera outbreaks have resulted in significant health burdens, loss of lives, and increased pressure on healthcare systems in Nigeria.

Beyond its health implications, cholera contributes to economic losses, reduced productivity, and increased household poverty, highlighting the need for effective prevention and control measures. Access to safe drinking water, proper sanitation, good hygiene practices, vaccination, health education, and timely treatment are essential strategies for reducing cholera transmission and mortality. However, the effectiveness of these measures is often influenced by environmental and hygiene factors such as inadequate water supply, poor waste management, overcrowding, climate-related challenges, and the consumption of contaminated food and water. Since cholera is largely a waterborne disease, improving environmental conditions and promoting hygienic practices are critical for preventing outbreaks, protecting adolescent health, and enhancing overall public health outcomes.

Access to safe water is one of the environmental factors that could help in the prevention of cholera. Cholera is a water-borne disease, making safe water essential for prevention. Access to safe drinking water is a basic human needs and a crucial factor in public health, impacting overall wellbeing, and reducing the spread of water borne diseases. Terefeet *al.* (2024) noted that a safe drinking water is water that is free from contamination, readily available and accessible on prevention or within reasonable reach. Otto *et al.* (2022) reiterated that the Human Right to Safe Drinking Water and Sanitation (HRSDWS) was adopted in 2010 under the UN resolution, calling for a safe, affordable, acceptable, available and accessible drinking water and sanitation services for all so as to minimize the rate of cholera.

Everyone has the right to sufficient continuous, safe, acceptable, physically accessible and affordable water for personal and domestic use. The sustainable development goals target 6.1 calls for universal and equitable access to safe and affordable drinking water. The World Health Organization (WHO, 2024) reported that at least 1.7 billion people use a drinking water source contaminated with faeces. Contaminated water poses the greatest risk to drinking water safety. Contaminated water can transmit cholera-related diseases such as diarrhea, dysentery, typhoid and polio, and is one of the major causes of premature deaths among adolescents.

Proper sewage disposal may also be crucial for preventing cholera. Cholera is a waterborne disease and improve sewage disposal can contaminate water sources ad increase the risk of infection. According to Mohd and Malik (2017), ensuring safe and hygiene sewage disposal, communities can significantly reduce the risk of cholera outbreaks. Improper disposal of

sewage, such as open defecation or dumping untreated waste into water sources, can contaminate drinking water and other water used for personal hygiene. Since cholera is caused by the bacterium *Vibrio cholera*, which is shed in the stool of infected individuals, if sewage is not properly disposed of, Javaeedet *al.* (2018) maintained that it can introduce bacteria into water sources, making it accessible to others who may consume or use the contaminated water. Hence, when communities have access to safe water, sanitation facilities and proper waste disposal, Javaeedet *al.* (2018) observed that such condition can reduce the risk of cholera and other waterborne diseases. Proper sewage disposal involve the use of latrines for safe disposal of feces while avoiding open defecation. Therefore, this study seeks to investigate environmental and hygiene factors as correlates of cholera prevention practice of adolescents in AkwaIbom North-East Senatorial District, Nigeria.

Statement of the Problem

Cholera is an infectious disease that causes profuse vomiting and acute watery diarrhea caused by the consumption of food or water contaminated with the bacterium *Vibrio cholera*. Cholera has been recognized as a general burden on the human population, disproportionately affecting the poor and most vulnerable people in low and middle-income countries like Nigeria. Adolescents in different states in Nigeria have been infected with cholera and experiences pre-mature deaths. As many adolescents use to experience pre-mature deaths due to cholera, it is important for adolescents to uphold the practice good hygiene, proper sanitation, safe drinking water, avoiding of non-contaminated foods among others, so as to avoid being infected with cholera. Unfortunately, the researcher observed low practice of cholera prevention measures among adolescents in AkwaIbom North East Senatorial District, due to inadequate infrastructure, poor sanitation, and limited access to clean water.

Noticing the unhealthy habits and practices of people including adolescents which resulted in them being infected with cholera disease, the Federal Government in collaboration with States Ministry of Health, as well as academic researchers have been encouraging and campaigning on the need of controlling and preventing cholera with consumption of clean water, proper sanitation and hygiene practices (WASH), yet some adolescents have become victim of cholera not only in the study area but in Nigeria. The researcher also observed that some empirical articles found in connection with cholera, were not conducted in line with the present study area and its variables. Therefore, the present study sought to fill this gap by examine environmental and hygiene factors as correlates of cholera prevention practice of adolescent in AkwaIbom North-East Senatorial District, Nigeria.

Purpose of the Study

The main purpose of the study was to investigate environmental and hygiene factors as correlates of cholera prevention practice of adolescents in AkwaIbom North-East Senatorial District, Nigeria. Specifically, the study sought to examine how:

1. Access to safe water relates with cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District.
2. Proper sewage disposal relates with cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District.

Research Questions

The following research questions were raised to guide the study:

1. What is the relationship between access to safe water and cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District?
2. What is the relationship between proper sewage disposal and cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District?

Research Hypotheses

The following research hypotheses were formulated to guide the study:

1. Access to safe water does not significantly relate with cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District.
2. Proper sewage disposal does not significantly relate with cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District.

Theoretical Framework

Theory of Planned Behaviour – (Ajzen and Fishbein, 1980)

The theory of planned behavior was propounded by Ajzen and Fishbein in 1980. The theory of planned behaviour is an extension of the theory of reasoned action (Ajzen and Fishbein, 1980) made necessary by the original model's limitations in dealing with behaviours over which people have incomplete volitional control. As in the original theory of reasoned action, a central factor in the theory of planned behaviour is the individual's intention to perform a given behaviour. Intentions are assumed to capture the motivational factors that influence a behaviour; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behaviour. As a general rule, the stronger the intention to engage in a behaviour, the more likely should be its performance. It should be clear, however, that a behavioural intention can find expression in behaviour only

if the behaviour in question is under volitional control, that is, if the person can decide at will to perform or not perform the behaviour.

This theory is relevant to the present study in that it helps to explain why people tend to accept or reject a particular type of behavior. According to the theory, people tend to accept a particular behavior, way of life and action when they are sure of the benefits they intend to derive from it. In the case of this study, adolescent students who consider cholera prevention practices to be beneficial to them are likely to practice those preventive measures such as frequent handwashing, drinking from safe water sources among others in order to gain the benefit. Others who consider it as harmful to them are likely not going to practice it.

Conceptual Framework

Environmental and Hygiene Factors

Environmental and hygiene factors are important determinants of human health, well-being, and quality of life. Environmental factors include physical, biological, and social conditions such as climate, air quality, water, soil, and the built environment, which influence health outcomes, access to resources, and community development. Climate change, extreme weather events, and poor air quality can negatively affect agriculture, water supply, and public health, particularly among vulnerable populations. Similarly, hygiene factors encompass personal and environmental practices such as sanitation, safe water supply, food safety, waste management, and personal cleanliness, which help prevent the spread of diseases and promote public health. Access to safe drinking water and adequate sanitation reduces the incidence of waterborne diseases, while school and community hygiene programs encourage healthy behaviors, especially among adolescents. Together, environmental and hygiene factors interact with social and economic conditions to shape health outcomes and overall societal well-being.

Cholera Prevention Practice

Cholera is an acute diarrhoeal disease caused by *Vibrio cholerae*; a gram negative rod-shaped bacterium. It is a potentially life-threatening, primarily waterborne disease. There are many serogroups of *V. cholerae*, but only two (01 and 0139) cause outbreaks (Fagbamila *et al.*, 2023). Cholera prevention practices are ways or measures of preventing cholera. Cholera prevention focuses on safe water and food practices, proper sanitation, and good hygiene. Key measures include using safe water sources, ensuring food is thoroughly cooked,

practicing frequent handwashing, and properly disposing of human waste (Chandaet *al.*, 2021). Community wide efforts like public health campaigns and vaccination

Access to Safe Water and Cholera Prevention Practice

Water is a fundamental resource that supports human survival, health, and socio-economic development. It is essential for vital bodily functions such as digestion, nutrient transport, hydration, and cognitive performance, while also promoting personal hygiene, mental well-being, and overall quality of life. Safe drinking water refers to water that is free from harmful biological, chemical, and physical contaminants and is obtained from improved sources such as boreholes, protected wells, piped systems, and rainwater collection facilities. Access to safe water is recognized as a basic human right and is critical for domestic use, food preparation, sanitation, and disease prevention. It also contributes to educational attainment, economic productivity, and community development by reducing the time, effort, and costs associated with water collection and water-related illnesses.

Despite its importance, inadequate access to safe water, poor sanitation, and ineffective water management continue to pose serious public health challenges, particularly in developing countries. Unsafe water is a major cause of waterborne diseases such as cholera, typhoid, diarrhea, dysentery, hepatitis A, and other infections, which disproportionately affect children and vulnerable populations. Contamination from sewage, industrial waste, agricultural runoff, and flooding further increases health risks. Improved water supply systems, sanitation facilities, hygiene practices, and water treatment methods such as filtration, chlorination, boiling, and solar disinfection have proven effective in reducing disease transmission and improving health outcomes. Consequently, ensuring universal access to safe and affordable drinking water remains essential for achieving sustainable development, enhancing public health, reducing healthcare burdens, and improving the well-being and future prospects of adolescents and communities worldwide.

Proper Sewage Disposal and Cholera Prevention Practice

Sewage refers to wastewater and human excreta generated from homes, shops, and communities, including urine, faeces, and wastewater from kitchens, bathrooms, and laundry activities. It contains suspended solids, organic and inorganic substances, nutrients, and disease-causing microorganisms such as bacteria, viruses, fungi, and protozoa. Proper sewage disposal involves the safe collection, treatment, and release of wastewater into the environment through systems such as septic tanks, pit latrines, sewerage networks, treatment

plants, and lagoons. Effective sewage management is necessary to prevent environmental pollution, protect groundwater and surface water sources, eliminate offensive odours, and maintain public health. Conversely, indiscriminate disposal of sewage can contaminate soil and water resources, encourage the breeding of disease vectors such as flies and mosquitoes, and create conditions that facilitate the spread of infectious diseases.

Proper sewage disposal is a critical public health measure for preventing cholera and other waterborne diseases, including typhoid, diarrhea, dysentery, schistosomiasis, and hepatitis. Since cholera is transmitted primarily through the faecal-oral route, inadequate sanitation and poor waste management can contaminate water sources, food supplies, and the environment, increasing the risk of disease outbreaks. Effective sanitation systems, wastewater treatment facilities, well-maintained latrines, and responsible waste disposal practices help prevent human waste from entering water bodies and food production systems, thereby interrupting the transmission cycle of infectious diseases. In addition, community education on sanitation and hygiene, combined with proper sewage infrastructure, contributes significantly to environmental sustainability, improved health outcomes, reduced mortality, and the overall well-being of communities.

METHODOLOGY

The study adopted a correlational research design to examine the relationship between environmental and hygiene factors and cholera prevention practices among Junior Secondary School Two (JS2) students in AkwaIbom North-East Senatorial District, Nigeria. The population comprised 19,260 JS2 students from 89 public secondary schools across nine Local Government Areas (LGAs). A sample of 963 students, representing 5% of the population, was selected using a multi-stage sampling procedure involving systematic random sampling of five LGAs, random selection of 50% of schools within the selected LGAs, and balloting to select 10% of JS2 students from each sampled school. Data were collected using a researcher-developed instrument titled *Environmental and Hygiene Factors Questionnaire (EHFQ)* and *Cholera Prevention Practices Questionnaire (CPPQ)*, consisting of 50 items rated on a four-point Likert scale. Face validity was established by three experts from the University of Uyo, while reliability was determined through a pilot test involving 40 students outside the study sample, yielding a Cronbach Alpha coefficient of 0.809, indicating high internal consistency. The questionnaires were administered personally by the researcher and two assistants, resulting in 956 valid responses, representing a 99.21% return rate. Data were analyzed using Pearson Product Moment Correlation (PPMC), with correlation

coefficients interpreted according to established decision rules. Ethical considerations included obtaining permission from school authorities, ensuring voluntary participation, maintaining respondents' anonymity and confidentiality, providing truthful information about the study, and using the collected data strictly for research purposes.

RESULTS

Research Question 1: What is the relationship between access to safe water and cholera prevention practices among adolescents in Akwalbom North-East Senatorial District?

Table 1: Summary of correlation analysis of responses between access to safe water and cholera prevention practices of adolescents.

Variables	N Σx Σy	Σx^2 value Σy^2	Σxy -	Remark
Access to Safe Water (x)	965 8654	96782 784906	.859	Very High Positive Relationship
Cholera Prevention Practices among Adolescents (y)	965 7954	85961		

Source: Field data (2026)

Result in Table 1 shows a correlation value of .859 for access to safe water and cholera prevention practices among adolescents. From the decision rule, it is noticed that a very high positive relationship exists between access to safe water and cholera prevention practices among adolescents in Akwalbom North-East Senatorial District. The implication of this result is that adolescents in secondary schools are more prone to observed practices that prevent cholera if they have access to safe source of water.

Research Question 2: What is the relationship between proper sewage disposal and cholera prevention practices among adolescents in Akwalbom North-East Senatorial District?

Table 2: Summary of correlation analysis of responses between proper sewage disposal and cholera prevention practice of adolescents

Variables	N Σx Σy	Σx^2 value Σy^2	Σxy -	Remark
Proper Sewage Disposal (x)	965 8997	94565 752863	.892	Very High Positive Relationship
Cholera Prevention Practices among Adolescents (y)	965 7954	85961		

Source: Field data (2026)

Result in Table 2 shows a correlation value of .892 for proper sewage disposal and cholera prevention practices among adolescents. From the decision rule, it is noticed that a very high positive relationship exists between proper sewage disposal and cholera prevention practice of adolescents in AkwaIbom North-East Senatorial District. The implication of this result is that the more communities maintain proper sewage disposal, the greater adolescent students would display behaviours that prevents cholera in schools.

Hypothesis 1: Access to safe water does not significantly relate with cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District.

Table 3: Summary of Pearson Product Moment Correlation analysis between access to safe water and cholera prevention practices among adolescents

Variables	n df	r-cal value	P-	Decision
Access to Safe Water (x) Cholera Prevention Practices among Adolescents (y)	956 954	.859	0.000	Sig.

Significant; $P < .05$; Source: Field data (2026)

Table 4.9 shows that the P-value of 0.000 is less than the significant levels ($P < .05$) at the degree of freedom of 954. Hence, the null hypothesis is rejected, while the alternate hypothesis is retained. This implies that access to safe water has significant relationship with cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District.

Hypothesis 2: Proper sewage disposal does not significantly relate with cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District.

Table 4: Summary of Pearson Product Moment Correlation analysis between proper sewage disposal and cholera prevention practices among adolescents

Variables	n df	r-cal value	P-	Decision
Proper Sewage Disposal (x) Cholera Prevention Practices among Adolescents (y)	956 954	.892	0.000	Sig.

Significant; $P < .05$; Source: Field data (2026)

Table 4 shows that the P-value of 0.000 is less than the significant levels ($P < .05$) at the degree of freedom of 954. Hence, the null hypothesis is rejected, while the alternate hypothesis is retained. This implies that proper sewage disposal has significant relationship

with cholera prevention practices among adolescents in Akwalbom North-East Senatorial District.

DISCUSSION OF FINDINGS

Access to Safe Water and Cholera Prevention Practices among Adolescents

Results from research question one and hypotheses one revealed a very high positive and significant relationship between access to safe water and cholera prevention practice of adolescents in Akwalbom North-East Senatorial District. This could be true because access to safe water is crucial for students' health and prevention of cholera access to safe water is crucial for preventing cholera by disrupting its faeco-oral transmission route. Providing safe water can help stop bacteria from spreading through contaminated sources, hence, making it imperative for students to use safe water for drinking, cooking and cleaning in school and at home. This finding is in agreement with that of Abiola *et al.* (2019) which revealed that increased access to safe drinking water significantly reduces adolescents' risk of poor cholera prevention practices. This finding also aligns with Fatima *et al.* (2021) which showed that adolescents with greater access to safe water demonstrated significantly better cholera prevention practices compared to those with poor access.

Providing clean water for drinking, washing hands and adequate sanitation as well as access to safe water for food preparations are critical to preventing transmission, reducing mortality and supporting sustainable development. Clean and sufficient water enables essential hygiene practices, such as hand washing with soap, cooking and drinking are critical for preventing cholera and other diarrheal diseases. This finding therefore aligns with that of Olawale *et al.* (2022), which revealed that adolescents with consistent access to potable water were more likely to adopt effective cholera prevention practices. The implication of this finding is that by ensuring access to safe water, the spread of water borne diseases can be prevented. Storing water in clean, covered containers is essential to prevent recontamination. When the water source is uncertain, using methods like boiling or chemical disinfection is a reliable way to make water safe to drink.

Proper Sewage Disposal and Cholera Prevention Practices among Adolescents

Results from research question two and hypotheses two revealed a very high positive and significant relationship between proper sewage disposal and cholera prevention practice of adolescents in Akwalbom North-East Senatorial District. This appears true because proper sewage disposal and effective hygiene practices are crucial as they form the long-term

solution for controlling cholera and other waterborne diseases. Cholera is primarily spread through the fecal-oral route via water or food contaminated by the feces of an infected person, a risk significantly heightened by inadequate sanitation and poor hygiene. This finding is in agreement with that Okoroet *al.* (2018), which disclosed that proper sewage disposal significantly, influenced adolescents' knowledge and practice of cholera prevention. This finding also aligns with that of Fatokiet *al.* (2020), which revealed that households with proper sewage disposal practices reported fewer cases of cholera and diarrhea among adolescents compared to households with poor sewage practices.

Safe disposal of human waste prevents the contamination of water sources (like wells, rivers, and ground water) used for drinking, cooking, and washing. Investing in sanitation infrastructure, such as sewage treatment plants and proper latrine facilities, can dramatically improve overall public health and reduce illness and death from preventable diseases, easing the strain on healthcare system. Thus, this finding corroborates that of Yakubuet *al.* (2022), that adolescents who practiced proper sewage disposal had a significantly lower risk of contracting cholera. Proper waste and sewage management can prevent the environmental degradation and contamination that can lead to a breeding ground for diseases and pests.

CONCLUSION

Based on the findings of the study, it was concluded that environmental and hygiene factors, particularly access to safe water and proper sewage disposal, have a strong influence on cholera prevention practices among adolescents in AkwaIbom North-East Senatorial District. The study revealed very high positive and statistically significant relationships between access to safe water and cholera prevention practices, as well as between proper sewage disposal and cholera prevention practices. This indicates that adolescents who have access to safe and potable water are more likely to engage in behaviours that prevent cholera, including the use of clean water for drinking, cooking, and personal hygiene. Similarly, communities and households that maintain proper sewage disposal systems create healthier environments that reduce the risk of cholera transmission and encourage positive health practices among adolescents.

The study therefore concludes that improving access to safe water and ensuring proper sewage disposal are critical strategies for enhancing cholera prevention among adolescents. These environmental and hygiene measures not only reduce exposure to disease-causing pathogens but also promote sustainable public health outcomes. Consequently, efforts aimed at strengthening water supply systems, improving sanitation infrastructure, and promoting

environmental hygiene are essential for reducing the incidence of cholera and other waterborne diseases among adolescents in the study area.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

1. Government agencies and relevant stakeholders should provide and maintain adequate sources of safe and potable water in schools and communities to enhance cholera prevention practices among adolescents.
2. School administrators should ensure the availability of functional water facilities and encourage students to use safe water for drinking, handwashing, food preparation, and other hygienic activities.
3. Local government authorities and environmental health agencies should strengthen sewage management systems and enforce regulations against indiscriminate disposal of sewage and human waste.
4. Communities should be encouraged to construct and properly maintain sanitary facilities such as septic tanks, latrines, and drainage systems to prevent environmental contamination.
5. Health educators and school health personnel should organize regular awareness campaigns and health education programmes on cholera prevention, safe water usage, and proper sanitation practices among adolescents.
6. Parents and caregivers should be sensitized on the importance of providing clean water and maintaining proper household sewage disposal practices to reduce adolescents' vulnerability to cholera and other waterborne diseases.
7. Government and non-governmental organizations should invest in water and sanitation infrastructure development, particularly in underserved rural communities, to improve environmental health conditions and reduce the prevalence of cholera outbreaks.
8. Continuous monitoring and evaluation of water quality and sanitation facilities in schools and communities should be carried out to ensure compliance with public health standards and sustain effective cholera prevention practices.

REFERENCES

1. Abbass, K., Qasim, M., Song, H., Murshed, M., Mahmood, H. &Younis, I. (2022). A review of the global climate change impacts, adaptation and sustainable mitigation measures. *Environmental Science and Pollution Research International*, 29(28), 42539–42559.
2. Ajzen, I. &Fishbein, M. (1980). *Theory of reasoned action / theory of planned behaviour*.
3. Abiola, T., Chukwuemeka, U., Yusuf, R., Janet, O., Ibrahim, S. & Halima, M. (2019). Access to safe water, sanitation, and cholera prevention practices among adolescents in rural Northern Nigeria. *Journal of Public Health and Epidemiology*, 11(4), 112–121.
4. Chanda, M., Mwansa, P., Grace, T. & Patrick, K. (2021). An assessment of the knowledge, practices and attitudes towards cholera preventive measures among students at Lusaka Apex Medical University in Lusaka, Zambia. *International Journal of Innovative Science and Research Technology*, 6(9), 1442–1450.
5. European Centre for Disease Prevention and Control (ECDPC) (2025). Weekly communicable threats reports. <https://www.ecdc.europa.eu>
6. Fatima, H., Okeke, P., Musa, L., James, A. & Bello, K. (2021). Knowledge of hygiene, safe water access, and cholera prevention practices among secondary school students in Kano State, Nigeria. *African Journal of Health Promotion*, 15(2), 76–85.
7. Fatoki, T., Ibrahim, O. &Oladele, R. (2020). Household sewage management and adolescent health outcomes in Lagos State, Nigeria. *African Journal of Public Health*, 12(4), 112–124.
8. Fagbamila, F., Abdulkarim, M., Aworh, A., Uba, B., Balogun, M. &Waziri, N. (2023). Cholera outbreak in some communities in North-East Nigeria, 2019: An unmatched case-control study. *Biomedical Journal of Public Health*, 23(1), 446–458.
9. Irena, I. & Milena, I. (2023). Global patterns of trends in cholera mortality. *Tropical Medical Infection Disease*, 8(3), 169–178.
10. Javaeed, A., et al. (2018). (Cited in-text: sanitation and sewage contamination and cholera transmission).
11. Mohd, G. & Malik, I. (2017). Sanitation and hygiene knowledge, attitude and practice in urban setting of Bangalore: A cross sectional study. *Journal of Community Medicine and Health Education*, 7(2), 540–551.

12. Olawale, A., Adebisi, J., Johnson, M., Faith, O. & Zainab, A. (2022). Sanitation behavior, potable water access, and cholera prevention practices among adolescents in urban Lagos, Nigeria. *International Journal of Adolescent Health*, 9(3), 144–156.
13. Okoro, T., Bassey, F., Johnson, K. & Musa, L. (2018). Sanitation management practices and cholera prevention among secondary school adolescents in Rivers State, Nigeria. *Nigerian Journal of Health Education*, 16(2), 95–106.
14. Otto, E., Opatoki, A. & Luyi, D. (2022). Water, sanitation and hygiene practice among students in secondary schools, Ijebu Ode, Nigeria. *Journal of Environmental Science and Economics*, 1(3), 15–19.
15. Terefe, B., Jembere, M. & Assimamaw, N. (2024). Access to drinking safe water and its associated factors among households in East Africa: A mixed effect analysis using 12 East African countries recent national health survey. *Journal of Health Population Nutrition*, 43(7), 128–135.
16. World Health Organization (WHO) (2024). Global situation report for cholera. <https://www.who.int>
17. Yakubu, M., Mohammed, A. & Hassan, G. (2022). Influence of sanitation practices on cholera outbreaks among adolescents in Kano State, Nigeria. *Journal of Adolescent Health and Hygiene*, 18(1), 133–142.