

KNOWLEDGE, ATTITUDE AND PRACTICES OF HEALTH CARE WORKERS ON CHOLERA PREVENTION AND CONTROL IN ENDEMIC REGIONS OF NIGERIA

Authors: Hameed A. Obituyi¹, Stephen I. Okogu², Kayode V. Odunuga³, Fadilat M. Gbajumo⁴, Aisha S. Nurudeen⁵, Chikaodinaka M. Odukwu⁶ and Chukwuemeka C. Njoku⁷

Affiliations: ^{1,3}Faculty of Clinical Sciences, Obafemi Awolowo College of Health Sciences, Olabisi Onabanjo University, Ago Iwoye, Ogun State, Nigeria.

²Faculty of Medical Sciences, University of Nigeria College of Medicine, Enugu State, Nigeria

^{4,5}Lagos State University College of Medicine, Ikeja, Lagos State, Nigeria.

⁶Afe Babalola University, College of Medicine and Health Sciences, Ado-Ekiti, Ekiti State, Nigeria

⁷Department of Obstetrics and Gynecology, Nnamdi Azikiwe University Teaching Hospital, Nnewi, Anambra State, Nigeria

Corresponding Author: Hameed A. Obituyi Faculty of Clinical Sciences, Obafemi Awolowo College of Health Sciences, Olabisi Onabanjo University, Ago Iwoye, Ogun State, Nigeria.

Email: hamtuyi@gmail.com

Citation: Hameed A. Obituyi, Stephen I. Okogu, Kayode V. Odunuga, Fadilat M. Gbajumo, Aisha S. Nurudeen, Chikaodinaka M. Odukwu and Chukwuemeka C. Njoku (2025) Knowledge, attitude and practices of health care workers on cholera prevention and control in endemic regions of Nigeria. *Frontline Professionals Journal* 2(3), 1-7

ABSTRACT

Background: Cholera remains a significant public health challenge in endemic regions of Nigeria, with healthcare workers (HCWs) playing a pivotal role in its prevention and control. This study assessed the knowledge, attitude, and practices (KAP) of HCWs regarding cholera in these regions.

Methodology: This was a cross-sectional study conducted amongst 353 healthcare workers across areas of cholera outbreaks in Nigeria. Health care workers in Nigeria from 18 years and above were engaged in the study. Data was collected using a self-administered structured online-based questionnaire created on Google Forms. The questionnaire design was guided by previous studies done in non-African countries, and it was adapted to suit the Nigerian setting. Data analysis was carried out using the Statistical package for Social Sciences (SPSS) by IBM. The data was reviewed and cleaned before analysis. Descriptive analyses were conducted to determine frequencies and proportions of categorical variables in the total study sample. Participants were assured of the confidentiality of their responses. No means of personal identification of respondents was included in the study tool. Respondents were informed that their participation was voluntary and consent was implied by completion of the questionnaire. This was a non-interventional study and hence, ethical clearance was not applicable.

Results: Foundational knowledge, with 98% identifying cholera as an infectious disease caused by *Vibrio cholerae* and transmitted via contaminated food and water. However, gaps were noted in understanding suspected and confirmed case definitions, with only 27% and 21.8%, respectively, aligning with global standards. Most HCWs recognized oral rehydration therapy and intravenous fluids as mainstays of treatment, yet only 39.1% correctly employed Ringer's Lactate for severe dehydration. Despite high awareness of cholera vaccination (95%), only 10.5% recommended its use during outbreaks. Barriers to effective cholera control included inadequate training (63%), poor infrastructure, limited resources, and insufficient government policy effectiveness (45.3%).

Conclusion: Preventive measures such as improved sanitation, access to clean water, and public health education were deemed effective. The findings highlight the urgent need for targeted training, enhanced healthcare infrastructure, robust surveillance systems, and community-focused interventions. Strengthening HCWs' capacities and addressing systemic challenges will be critical in reducing cholera incidence and mortality in endemic regions.

Keywords: Endemic, *Vibrio cholerae*, Ringer's Lactate.

INTRODUCTION

Cholera is an extremely virulent disease with its transmission closely linked to inadequate access to clean portable water, poor food handling and poor environmental sanitation (World Health Organization. Cholera fact, 2024). The disease is caused by the ingestion of food or water contaminated by the bacterium *Vibrio cholera* (Orimbo EO, Oyugi E, et al., 2018). There are only two serogroups of *V. cholerae* (O1 and O139) that cause outbreaks out of the many serogroups that exist. The infection is characterized by severe bouts of acute diarrhea (rice-water stool) and vomiting and affects people of all ages (Curran KG, Wells E, Crowe SJ, et al., 2015). Nigeria is regarded as one of the 3 countries in acute crisis of cholera in Africa, with a case fatality rate (CFR) of up to 1.6% in Nigeria (World Health Organization, Cholera fact, 2024). The Nigeria Centre for Disease Control (NCDC) stated that the cholera outbreak in Nigeria has seen a sharp increase in 2024, with suspected cases rising by an alarming 220 per cent. (NCDC, 2024) Factors such as climate change, inadequate clean water, poor sanitation, poverty, underdevelopment, and population displacement due to emerging and re-emerging conflicts and disasters from natural hazards all contribute to the rise in cholera outbreaks. (Elimian KO, Musah A, Mezue S, et al 2018) The Northern Nigeria, especially Katsina, Kano and Plateau states, has been known to be endemic to cholera infection, with the latter recording the highest CFR of 23%. Infectious diseases, in general, are better contained by putting in place effective preventive measures and prompt identification of cases in periods of outbreaks. Cholera management, therefore, is influenced by government policies, preventive measures put in place and to an important extent, the knowledge, attitudes and practices of healthcare workers who play a major role in carrying out these preventive measures. Health care workers have a critical role in the prevention and control of cholera. Their KAP significantly impacts the approaches utilized in cholera control in areas where the disease commonly occurs (Orimbo EO, Oyugi E, et al., 2018). It is argued that HCWs who have adequate knowledge of cholera, methods of transmission, implied prevention measures, and treatment measures will ultimately deliver important control measures and educate the community members. (Orimbo EO, Oyugi E, t al, 2018) The misconceptions and negative attitude toward cholera management agitate and might slow down outbreak response programs and raise the probability of progressive disease expedition. (Bankole OT, Abbass G, Obembe TA et al, 2021). Healthcare Workers' KAP is important to be understood and addressed in order to design accurate strategies and increase the efficacy of the response to cholera. This study aims to assess the knowledge, attitudes, and practices of HCWs in Nigeria's endemic regions to reform public health policies and training programs aimed at enhancing cholera prevention and control measures.

METHODOLOGY

Study Area: Nigeria has an 2024 estimated population of 232,679,474 at an annual growth rate of 2.15%. There are 36 states in Nigeria and according to epidemiological report from Nigeria centre for disease prevention and control(NSCDC), from 29th April 2024- October 2024, the states that have been majorly affected are Bayelsa, Zamfara, Abia, Bauchi, Cross River, Ebonyi, Delta, Katsina, Jigawa, Borno, Kano and Lagos States. The study was conducted across healthcare facilities across these states, both private and public/government-owned healthcare institutions. The estimated number of healthcare workers in Nigeria as of October 2023, according to the Ministry of health, was 400,000. Healthcare workers include physicians, pharmacists, nurses, midwives, laboratory scientists, physiotherapists and the auxiliary staff all contributing to the healthcare sector. The various social media platforms

in these states where there were predominantly healthcare workers were identified and utilized during the study.

Study Design: This was a cross-sectional study conducted amongst healthcare workers across areas of cholera outbreaks in Nigeria

Sample Size Estimation, Study Population and Procedure: Healthcare workers in Nigeria from 18 years and above were engaged in the study. Questionnaires were distributed to the social media platforms of the healthcare workers (Mainly via WhatsApp). Responses were obtained from individuals who voluntarily consented to participate by answering the questionnaires. Due to pragmatic constraints imposed by the study setting (e.g., social media preferences, social media groups and time), the overall study of which this was a component did not formally estimate the sample size.

Data Collection and Methods: Data was collected using a self-administered structured online-based questionnaire created on Google Forms. The questionnaire design was guided by previous studies done in non-African countries, and it was adapted to suit the Nigerian setting. The Questionnaire has four sections: Section one is the Socio-demographic characteristics of the respondents as follows: Occupation, age, sex, Marital status, religion and ethnicity. The second section contains the knowledge about cholera: as follows; whether they know that cholera is an infectious disease, whether they know that there is an outbreak of cholera, whether they know the predominant symptom and/or sign of cholera, whether they have encountered any suspected case of cholera, the organisms that causes the cholera, the common symptoms of cholera, the various routes of transmission of the infections, the incubation periods, the drugs that that increases the risk of the cholera infection, the definitions of Alert case, suspected case, probable case, confirmed case. The third section contains information about the management of cholera and its outbreak; who to contact in case of any suspected case, any training on outbreak management, the priority in the management of cholera, methods to use in cholera surveillance, investigations to carry out to confirm cholera, medications used to treat cholera and challenges faced while treating a cholera case. The fourth section contains information about the prevention of cholera: knowledge about effective means of preventing cholera, whether there are sufficient ways for cholera prevention in their facilities/area, education of their patient on the ways to prevent cholera infection, cholera vaccines available and the recommendations for the vaccines. The type of questions used included: Yes/No questions, multiple choice response questions, as well as other open questions

Statistical Analysis: Data analysis was carried out using the Statistical package for Social Sciences (SPSS) by IBM. The data was reviewed and cleaned before analysis. Descriptive analyses were conducted to determine frequencies and proportions of categorical variables in the total study sample.

Ethical Considerations: Participants were assured of the confidentiality of their responses. No means of personal identification of respondents was included in the study tool. Respondents were informed that their participation was voluntary and consent was implied by completion of the questionnaire. This was a non-interventional study, and hence, there was no need for ethical clearance.

RESULTS

Table 1: Age distribution of Healthcare Workers

	Frequency	Percent
26-35 years	248	70.3
36-45 years	27	7.6
46 years and above	8	2.3
Less than 25 years	70	19.8
Total	353	100.0

A large number of respondents fall within the age bracket of 26-35 years, with the majority being female (56.9%). Most are Christians (73.1%), with the Yoruba being the largest tribe recorded at 65%. Health care workers across

the Country, including Medical Doctors, Pharmacists, Nurses/Midwives, and Community Health Extension workers (CHEW) participated in the study. Medical Doctors represented the largest group with 58% followed by Nurses and Midwives with a combined 20%. This may affect the perception and, consequently, the knowledge aspect of this study. 182 out of the 353 respondents responded YES to having encountered a suspected case of cholera; however, most did not record a recent outbreak of cholera. 27% defined a Suspected Case as any person aged 2 years or more with acute watery diarrhea and severe dehydration or who dies from acute watery diarrhea, while 91 respondents (21.8%) defined a Confirmed Case as a suspected or probable case in which *Vibrio cholerae* O1 or O139 strain has been isolated from the stool. 98% of these respondents agreed that Cholera is an infectious disease. Abuse of medications like Augmentin (antibiotic) and antiviral drugs increase the severity of cholera infections, and these drugs were more often listed as major aggravators of cholera severity by the respondents. More than 90% of the respondents agreed that Cholera is an infectious disease caused by *Vibrio cholera* with a Hallmark of Profuse watery diarrhea. Vomiting with diarrhea, dehydration and abdominal pain (21.8%) is the most frequent presentation of cholera from our study.

In General, diseases with clear etiology or infectious agents are more contained by various preventive measures as against those with complex and multiple etiologies. Contaminated food and water are the major means by which cholera is transmitted, and this was represented to a larger extent by our study (More than 90%). Most chose an incubation period of a few hours to 5 days. The incubation period is defined as the period from when the person ingests cholera-contaminated water/food to when they first become ill. As regards the propagation of transmission, 21.5% agreed that the disease has 2 reservoirs, Humans and water, while about one-fifth believed that animals do not play a role in cholera transmission.

Tables 2 and 3: Knowledge and Practices of HCWs on Cholera Vaccination

Is the cholera vaccine available in Nigeria?		
Response	Frequency	Percent
NO	123	34.8
YES	230	65.2
Total	353	100.0

How often do you recommend the cholera vaccine to your patients?		
Response	Frequency	Percent
Always	66	18.7
Most of the time	43	12.2
Never	93	26.3
Rarely	82	23.2
Sometimes	69	19.5
Total	353	100.0

In terms of Attitude of HCW towards cholera management, most chose to contact the Call Line of Nigeria Center of Infectious Disease during an outbreak (60.6%), with only 0.6% opting to inform the Head of Department. More than half (60%) did not receive training on prevention and control of disease outbreak in the last year, sixty-three percent never had trained on cholera outbreaks, while only 41% of the health care workers believed the current cholera management guidelines are adequate. This shows a lagging deficit in the knowledge pool of the healthcare workforce. Replacing the lost fluid and electrolytes, the use of antibiotics was the treatment of priority believed to be given to cholera patients. However, Oral rehydration Therapy, Intravenous fluids and Antibiotics remain the primary approach to treating cholera. (7.4%) Ciprofloxacin (11.3%) Doxycycline (19.3%) and Flagyl (14.7%) are

the antibiotics of choice, only 4.2% combined these drugs as polytherapy. For mild and some dehydration, the use of Oral rehydration salts and for severe dehydration, the use of Ringer's Lactate to restore fluid loss is the commonest practice by healthcare workers (39.1%). Community reporting, Laboratory confirmation, Syndromic surveillance and Hospital records were the major surveillance measures. (9.6%) Lack of Resources: Inadequate training, Poor Infrastructure, delayed patient presentation, and Lack of community awareness are the major challenges facing healthcare providers (27.8%) in cholera management. Less than half of health care workers (45.3%) deemed Government policies as effective, with only 10.5% of HCW deeming government policies as effective. Preventive measures advised by the majority (59.1%) of HCWs for cholera prevention include improved sanitation, access to clean water, vaccination, public Health Education, and Proper Food Handling Practices. Only 24.1% believe that the cholera prevention measures are effective in their areas, while 3.1% of the Nation's healthcare providers never educate their patients about Cholera prevention. One-on-one consultation (34.6%) and community outreach programs (5.7%) are the methods frequently used to educate the populace on cholera prevention and treatment. Vaccination as part of primary prevention of cholera is a point of interest. Nearly 95% of the HCWs are aware of the cholera vaccine, but 27.3% never recommend the vaccines, while only 10.5% recommend it during outbreaks

DISCUSSION

This study evaluated the knowledge, attitudes, and practices (KAP) of healthcare workers (HCWs) on cholera prevention and control in endemic regions of Nigeria, shedding light on significant gaps and strengths in the current approach. On the Knowledge of Cholera Prevention and Management, the findings demonstrated a solid foundational knowledge of cholera among HCWs. Nearly all respondents (98%) correctly identified cholera as an infectious disease caused by *Vibrio cholerae*, primarily transmitted through contaminated food and water. This aligns with global data underscoring the importance of identifying the clear etiological agent in effective disease containment.^{1,4} However, only 27% could define a suspected case based on WHO standards, and a smaller fraction (21.8%) accurately described a confirmed case. This indicates a need for more comprehensive training to align HCWs with global definitions and diagnostic standards.

On the attitudes Towards Cholera Management

The attitudes of HCWs towards cholera prevention were mixed. While 60.6% reported contacting the Nigeria Center for Infectious Disease during outbreaks, minimal engagement (0.6%) with local supervisors suggests a gap in intra-facility communication during emergencies. Furthermore, only 41% of respondents deemed the current management guidelines as adequate, highlighting dissatisfaction with available protocols or their implementation. Notably, 63% of HCWs had not received recent training on cholera outbreaks, emphasizing the urgent need to integrate regular capacity-building sessions into healthcare systems.

On the Practices in Cholera Management and Prevention

Oral rehydration therapy (ORT) and intravenous fluids were widely recognized as the mainstay treatments, yet only 39.1% correctly employed Ringer's Lactate for severe dehydration. The use of antibiotics like Doxycycline (19.3%), Ciprofloxacin (11.3%), and Flagyl (14.7%) varied, with limited adherence to recommended polytherapy approaches (4.2%). Surveillance measures, including community reporting and laboratory confirmation, were inconsistently applied, reflecting systemic inefficiencies.

Vaccination emerged as a critical preventive measure, with 95% awareness among HCWs. However, only 10.5% recommended cholera vaccines during outbreaks, and 27.3% never advocated for them, illustrating a missed opportunity in leveraging this intervention to reduce cholera incidence.

Challenges and Barriers

Several barriers impede effective cholera control in Nigeria. Limited resources, inadequate training, and poor infrastructure were cited by 27.8% of respondents as significant challenges. These systemic issues contribute to delayed patient presentations and reduced community awareness, thereby exacerbating cholera transmission. Additionally, the effectiveness of government policies was questioned, with less than half of the respondents (45.3%) considering them adequate.

Preventive Measures

Preventive measures such as improved sanitation, access to clean water, and public health education were commonly endorsed by HCWs (59.1%). However, only 24.1% believed these measures were effective in their regions. This disparity underscores the need for enhanced implementation strategies and community engagement to bridge the gap between theoretical knowledge and practical impact.

RECOMMENDATIONS

1. Organize regular training programs and workshops focusing on the diagnosis, treatment, prevention, and control of cholera.
2. Ensure HCWs have easy access to updated, evidence-based guidelines on cholera management.
3. Disseminate digital and printed resources from global health authorities like WHO and NCDC.
4. Invest in improving healthcare facilities in cholera-endemic regions to support timely diagnosis and effective treatment.
5. Equip healthcare facilities with necessary supplies, including oral rehydration salts, antibiotics, and IV fluids.
6. Increase public awareness campaigns on cholera prevention and control through community engagement.
7. Collaborate with local leaders, schools, and religious institutions to promote safe hygiene practices.
8. Expand access to clean water and sanitation facilities in vulnerable communities.
9. Integrate WASH initiatives into public health strategies, ensuring sustainable access to safe drinking water and proper waste disposal.
10. Strengthen cholera surveillance systems to detect outbreaks early and respond swiftly.
11. Support research initiatives exploring the effectiveness of interventions aimed at HCWs in endemic areas.

CONCLUSION

This study underscores the essential role of healthcare workers in cholera prevention and control in Nigeria's endemic regions. While HCWs demonstrated considerable knowledge of cholera etiology and transmission, significant gaps persist in case definition, treatment practices, and vaccination advocacy. Systemic barriers, including limited training, inadequate infrastructure, and insufficient government support, hinder effective cholera management. To mitigate these challenges, prioritising capacity-building initiatives, improving access to updated clinical guidelines, strengthening healthcare infrastructure, and promoting community-based WASH programs are imperative. Furthermore, enhanced surveillance systems and proactive public health policies are essential to ensuring timely detection and effective outbreak response. Addressing these gaps will not only empower HCWs but also contribute significantly to reducing the burden and enhancing health outcomes in affected regions.

REFERENCES

World Health Organization. Cholera [Internet]. Geneva: World Health Organization; 2024 Oct. Available from: <https://www.who.int/news-room/fact-sheets/detail/cholera>

Orimbo EO, Oyugi E, Dulacha D, Obonyo M, Hussein A, Githuku J, Owiny M, Gura Z. 2018 Knowledge, attitude and practices on cholera in an arid county, Kenya,: A mixed-methods approach. *PloS one.*; 15(2):e0229437.

Curran KG, Wells E, Crowe SJ, Narra R, Oremo J, Boru W, Githuku J, Obonyo M, De Cock KM, Montgomery JM, Makayotto L 2015. Systems, supplies, and staff: a mixed-methods study of health care workers' experiences and health facility preparedness during a large national cholera outbreak, Kenya. *BMC Public Health*. 18:1-2.

World Health Organization Regional Office for Africa. Monthly Regional Cholera Bulletin, 2024 Brazzaville: WHO Regional Office for Africa; Available from: <https://www.afro.who.int/publications/monthly-regional-cholera-bulletin-july-2024>

Punch Newspaper. Cholera outbreak surged by 220% in 2024 - NCDC 2024 Oct 6. Available from: <https://punchng.com/cholera-outbreak-surged-by-220-in-2024-ncdc/>

Elimian KO, Musah A, Mezue S, Oyebanji O, Yennan S, Jinadu A, Williams N, Ogunleye A, Fall IS, Yao M, Eteng WE, Abok P, Popoola M, Chukwuji M, Omar LH, Ekeng E, Balde T, Mamadu I, Adeyemo A, Namara G, Okudo I, Alemu W, Peter C, Ihekweazu C. 2018, Descriptive epidemiology of cholera outbreak in Nigeria, January-November,: implications for the global roadmap strategy. *BMC Public Health*. 19(1):1264. doi: 10.1186/s12889-019-7559-6. PMID: 31519163; PMCID: PMC6743111

Ajoke Okutola Adagbada, Solayide Abosede Adesida, 1, & Francisca Obiageri Nwakorie, 1 Mary-Theresa Niemogha, 1 and Akitoye Olusegun Coker 2 Cholera Epidemiology in Nigeria: an overview

Bankole OT, Abbass G, Obembe TA, Ajayi IO. Knowledge of Health Workers on Cholera Management In Oyo State: Results Of a Training Intervention. *Ann Ib Postgrad Med*. 2021 Dec; 19(2):103-111. PMID: 36159040; PMCID: PMC9484319.

Schedwin M, Bisumba Furaha A, Elimian K, King C, Malembaka EB, Yambayamba MK, Tylleskär T, Alfvén T, Carter SE, Welo Okitayemba P, Mapatano MA. Facility capacity and provider knowledge for cholera surveillance and diarrhoea case management in cholera hotspots in the Democratic Republic of Congo—a mixed-methods study. *Global Health Action*. 2024 Dec 31; 17(1):2317774.

Obubu, M., Chuku, N., Ananaba, A., Sadiq, F. U., Sambo, E., Kolade, O. Serrano, O. (2023). Evaluation of healthcare facilities and personnel distribution in Lagos State: implications on universal health coverage. *Hospital Practice*, 51(2), 64–75. <https://doi.org/10.1080/21548331.2023.2170651>