

An Assessment of the Knowledge, Practices and Attitudes towards Cholera Preventive Measures among Students at Lusaka Apex Medical University in Lusaka, Zambia

Arthur Chisanga¹; Steven Daka¹; Esther Masebe¹; Remmy Mulenga¹; Banda Dorothy¹; Tinkler Saul Simbeye¹; Kaziwe Simpokolwe²; Wezi Kachinda²; Isabel Nyahoda³; Monica Katunga³; Munene Bernadette⁴; Chakolwa Godwin⁵; Emmanuel Chirwa⁵

¹Faculty of Nursing and Midwifery, Lusaka Apex Medical University, Lusaka, Zambia

²Faculty of Medicine, Lusaka Apex Medical University, Lusaka, Zambia

³Faculty of Nursing and Midwifery Sciences, Eden University, Lusaka, Zambia

⁴Faculty of Nursing and Midwifery Science, Cavendish University, Lusaka, Zambia

⁵Faculty of Pre-Medical Sciences, Lusaka Apex Medical University, Lusaka, Zambia

Abstract:- This study investigated students' knowledge, practices, attitudes, and perceptions concerning cholera prevention, aiming to identify gaps and areas for improvement in public health education and intervention strategies. Employing a cross-sectional design and quantitative research approaches, data were collected from 384 participants at Lusaka Apex Medical University, Chalala Campus, located in Lusaka, Zambia. Findings revealed that 62.9% of respondents had received cholera prevention education, indicating commendable efforts, but significant knowledge gaps persisted, potentially increasing susceptibility to outbreaks. While 25.7% demonstrated a profound understanding, 17.1% remained neutral, and 5.7% admitted to lacking knowledge, underscoring the need for comprehensive educational initiatives. Additionally, 60.0% correctly identified all common cholera symptoms, highlighting the importance of ongoing education. Although 60.0% identified all key prevention methods, targeted campaigns are needed to address knowledge disparities. While 40.0% of students consistently washed hands, 20.0% did so sporadically, necessitating interventions. Boiling water emerged as a prevalent safety measure (34.3%), emphasizing the need for enhanced education. Concerning attitudes, 28.6% expressed high concern about cholera, and 51.4% strongly agreed on the importance of prevention, indicating potential areas for targeted interventions. Despite 71.4% seeking medical attention for cholera-like symptoms, 28.6% did not, emphasizing the importance of promoting timely intervention. Various sources, including healthcare professionals (34.3%) and the internet (28.6%), contributed to cholera prevention knowledge, highlighting the significance of leveraging diverse communication channels. This study offers insights into enhancing cholera prevention efforts among students through targeted

education, awareness campaigns, and improved access to healthcare services, ultimately contributing to enhanced public health outcomes.

Keywords:- Cholera, Cholera Prevention, Student Knowledge, Public Health Education, Intervention Strategies.

I. INTRODUCTION

Cholera, a highly contagious diarrheal disease caused by the bacterium *Vibrio cholerae*, has been a persistent global health challenge for centuries. Despite advancements in medicine and public health, recurring outbreaks continue to threaten millions of lives annually (WHO, 2023). These outbreaks reveal deeper societal issues, such as inadequate sanitation, contaminated water sources, poverty, and limited access to healthcare, which are often concentrated in specific regions and exacerbate the disease's impact (World Bank, 2022). Southern Africa, including Zambia, has faced recurrent cholera outbreaks, emphasizing the disease's complexity and the ongoing struggle for control. Systemic challenges, such as limited access to clean water and sanitation (UNICEF & WHO, 2023), unequal healthcare distribution (World Bank, 2022), and socioeconomic disparities (Ng'oma et al., 2023), create environments conducive to cholera transmission. The recent outbreak in Lusaka, Zambia's capital, underscores the urgency for sustained vigilance, proactive measures, and a multifaceted approach to address the root causes of cholera and prevent future outbreaks.

Cholera pandemics have caused significant suffering and loss of life since the early 1800s, leaving a lasting impact on human populations. Historical analyses, such as those by Harris et al., (2012), highlight the enduring presence of major cholera outbreaks dating back to the 19th century. Present-day

data from the WHO confirm the ongoing burden of cholera, with an estimated 1.3 to 4.0 million cases occurring annually worldwide (Ali et al., 2015). This high incidence rate translates into a substantial number of individuals grappling with the debilitating effects of the disease each year. In terms of mortality, cholera is equally concerning. WHO estimates suggest that these annual cases result in between 21,000 to 143,000 deaths (Ali et al., 2015). These statistics underscore the severity of cholera as a public health threat and highlight the urgent need for effective prevention and intervention measures. Cholera outbreaks also serve as potent indicators of underlying socioeconomic challenges and developmental disparities within affected regions (Adeneye et al., 2016).

The transmission of cholera thrives in environments characterized by inadequate sanitation and contaminated water sources. The persistence of cholera outbreaks reflects deficiencies in basic infrastructure and essential services within afflicted communities. Socioeconomic factors such as poverty and limited access to healthcare exacerbate the impact of cholera outbreaks, hindering individuals' ability to access clean water, sanitation facilities, and medical care, consequently contributing to higher rates of infection and mortality (Kadaleka, 2011). Cholera's primary mode of transmission is through the fecal-oral route, where ingestion of contaminated food or water facilitates the spread of the disease. Promoting proper hygiene practices, ensuring safe water consumption, and establishing adequate sanitation infrastructure are critical to preventing cholera dissemination. Clinical manifestations of cholera range from asymptomatic carriage to severe, life-threatening illness, with varying degrees of symptom severity and clinical outcomes (WHO, 2023).

The study addresses the pressing issue of cholera outbreaks in Zambia, particularly in Lusaka, where gaps in knowledge persist concerning students' comprehension and adherence to cholera prevention measures. Understanding the role of students in cholera prevention and transmission is crucial given the unique social and environmental factors present within higher education institutions. Students often gather in densely populated settings, creating environments conducive to the rapid spread of infectious diseases like cholera. The transient nature of student populations can contribute to the dissemination of cholera across different geographical areas. (Smith & Johnson, 2023). This concern is particularly relevant for students residing in crowded boarding houses with compromised hygiene standards. Although previous research indicates varying levels of knowledge about cholera prevention among students in different contexts, limited data exists specifically for Zambian students, especially those residing in high-risk settings like boarding houses. Despite the clear relevance of students in cholera prevention and transmission, existing literature on this topic remains limited. Therefore, research that specifically examines the knowledge, attitudes, and behaviors of students regarding

cholera prevention is essential. Such insights are critical for informing targeted interventions aimed at reducing the risk of cholera outbreaks among student populations and safeguarding public health within academic environments. This knowledge gap impedes the development of targeted interventions tailored to address the specific needs and challenges faced by this vulnerable population group. The significance of this study lies in its aim to assess the current knowledge, attitudes, and hygiene practices of medical students at LAMU, providing valuable insights into their susceptibility to cholera and their potential role in disease transmission or prevention. By elucidating the prevailing knowledge gaps and misconceptions among students, the study sought to inform the development of effective interventions aimed at enhancing student awareness and promoting appropriate cholera prevention practices (Brown & Wilson, 2022). Thus, this study was guided by the following research questions: What is the extent of knowledge regarding cholera transmission, symptoms, and preventive measures among medical students at LAMU, Chalala Campus?; What are the prevailing practices related to cholera prevention, including hygiene, sanitation, and water management, among medical students at LAMU, Chalala Campus?; What are the attitudes and perceptions of medical students at LAMU, Chalala Campus, regarding cholera prevention measures, and to what extent are they willing to embrace recommended interventions?

II. LITERATURE REVIEW

Cholera remains a significant global health threat, affecting numerous regions despite extensive prevention and control efforts. This section synthesizes literature on cholera's epidemiology, transmission dynamics, clinical manifestations, preventive strategies, and the knowledge, attitudes, and practices (KAP) related to cholera among university students. Cholera, primarily caused by the *Vibrio cholerae* bacterium, is highly fatal in areas lacking clean water and proper sanitation. Despite historical and healthcare advancements, outbreaks persist due to socio-economic disparities, environmental factors, and healthcare system challenges. Understanding the KAP of university students is crucial as they are vulnerable to transmission and play a pivotal role in community education and prevention efforts. The literature review highlights significant knowledge gaps and challenges in cholera prevention, underscoring the necessity for tailored interventions within university settings. Addressing these gaps through comprehensive educational initiatives, community engagement, and infrastructure improvements is essential for enhancing cholera prevention measures among university students.

The World Health Organization (WHO, 1998) underscores the importance of knowledge in cholera prevention, yet the disease continues to affect over 100 countries, causing significant morbidity and mortality. Cholera, primarily caused by the *V. cholerae* bacterium, reaches epidemic proportions in various regions, with rapid fatality risks without timely medical attention. Efforts in Southern African countries to disseminate knowledge about cholera prevention have been ongoing, but the disease remains a major public health issue due to inadequate sanitation, contaminated water sources, poverty, and limited access to healthcare (community health nursing lecture notes, 2009). Cholera manifests as an acute diarrheal disease primarily caused by *V. cholerae* serogroups O1 and O139, with non-O1 and non-O139 serogroups also contributing to diarrheal illness (Chen et al., 2007; Dutta et al., 2013; Somboonwit et al., 2017). The bacterium's complex life cycle and ability to survive in adverse conditions contribute to its persistence and transmission (Almagro-Moreno and Taylor, 2014). Effective prevention requires multifaceted approaches, including public health surveillance, water sanitation, hygiene promotion, and vaccination (WHO, 2019), emphasizing the critical role of community engagement and education in fostering behavioral change and promoting preventive practices (Mpuzi et al., 2005).

Empirical studies highlight significant gaps in cholera knowledge among university students across various countries. Naser et al., (2023) found that Iranian medical students had moderate understanding of cholera transmission and symptoms but lacked knowledge of preventive measures, underscoring the need for comprehensive cholera education. Mourad et al., (2019) reported low levels of knowledge among Lebanese university students concerning cholera transmission and prevention, emphasizing the necessity for educational initiatives to enhance understanding and mitigate disease spread. Similarly, Khan et al., (2017) found Pakistani university students exhibited moderate understanding of symptoms and transmission but had notable gaps in preventive knowledge, highlighting the importance of targeted educational interventions. In Bangladesh, Rahman et al., (2019) found limited knowledge among university students about cholera, posing challenges for effective public health interventions. These findings collectively underscore the need for educational efforts to improve university students' awareness and comprehension of cholera prevention strategies.

Studies in South Korea, Ethiopia, and Nigeria further illustrate the knowledge deficiencies among university students regarding cholera. Kim et al., (2018) reported basic understanding of symptoms among South Korean students but significant gaps in knowledge of transmission and preventive measures, necessitating educational interventions. Gebreeyessus and Adem (2018) found Ethiopian students had limited knowledge about cholera transmission, symptoms, and

prevention, highlighting the need for enhanced education. In Nigeria, Olugbenga et al., (2020) and Afolabi et al., (2019) revealed moderate to limited knowledge among university students, particularly concerning preventive measures. These studies suggest that insufficient public health education, inadequate information access, and cultural factors contribute to these knowledge gaps (Chisanga, et al., 2024). Consequently, targeted interventions, including curriculum integration, workshops, and community-based awareness campaigns, are critical for equipping university students with the knowledge necessary to prevent cholera transmission and support broader public health initiatives (Chisanga et al., 2023).

Empirical studies on cholera attitudes and practices among university students reveal varied perspectives and behaviors across different regions. Ahmed et al. (2020) and Alam et al., (2019) examined students in Bangladesh, finding generally positive attitudes towards cholera prevention but persistent misconceptions and a lack of awareness about specific control strategies. These studies highlight the importance of comprehensive educational campaigns and community engagement initiatives to address misconceptions and enhance students' understanding of cholera prevention (Chisanga et al., 2024). Similarly, in Malaysia, Ngai et al., (2018) identified positive attitudes towards cholera prevention among students but noted challenges in adherence to recommended practices due to factors like convenience and social norms. The study underscores the need to address contextual barriers to behavior change through interventions that consider accessibility, cultural norms, and social influences (Chisanga et al., 2023).

In India, Sharma et al., (2018) assessed university students' attitudes and perceptions towards cholera prevention, finding a generally positive outlook but identifying misconceptions regarding vaccination and water treatment methods. This suggests the need for targeted educational campaigns to address these gaps. Liu et al. (2020) in China highlighted varied levels of adherence to hygiene practices and sanitation measures among students, influenced by factors such as access to clean water and socio-economic status. The study emphasizes the necessity of targeted interventions to promote uniform adoption of cholera prevention practices among university students (Chisanga et al., 2024).

In Nigeria, Oluwafemi et al. (2018) and Asamoah et al. (2016) explored university students' attitudes towards cholera prevention, revealing positive attitudes but concerns about the accessibility and affordability of preventive measures. These studies highlight the importance of addressing socio-economic barriers to access to hygiene and sanitation resources through targeted interventions. Educational efforts should focus on promoting both individual and community-level preventive behaviors to effectively mitigate the risk of cholera transmission (Chisanga et al., 2024).

Further empirical studies on hygiene practices related to cholera prevention underscore the need for comprehensive educational interventions. In Bangladesh, Islam et al., (2022) and Haque et al., (2019) found that while students reported engaging in handwashing, adherence to other preventive measures like safe water consumption was less consistent. Similarly, studies in Vietnam (Nguyen et al., 2018), India (Patel et al., 2020), Kenya (Kiptinness et al., 2018), and Pakistan (Khan et al., 2019) identified gaps in students' knowledge and implementation of comprehensive cholera prevention strategies. These findings emphasize the importance of promoting holistic hygiene and sanitation practices, improving infrastructure, and addressing challenges related to access to sanitation facilities and safe water sources to effectively prevent cholera transmission among university students (Chisanga et al., 2023).

III. THEORETICAL FRAMEWORK

This study was grounded in Social Cognitive Theory (SCT), providing a comprehensive framework for understanding human behavior in social contexts. SCT posited that individuals learn through observation, modeling, and reinforcement, with behavior influenced by cognitive processes, social factors, and environmental determinants (Rimal et al., 2009). The study aimed to explore how university students acquired knowledge, developed attitudes, and engaged in preventive behaviors related to cholera. It examined the interplay between individual factors (self-efficacy, perceived benefits), social influences (peer norms, cultural beliefs), and environmental factors (access to clean water, sanitation facilities) in shaping cholera prevention behaviors among university students.

SCT, developed by Albert Bandura, emphasized the dynamic interaction between personal factors, environmental factors, and behavior. It suggested that individuals learned through observation, modeling, and reinforcement, with behavior influenced by cognitive processes such as attention, memory, and motivation, as well as by social factors such as peer influences, societal norms, and cultural beliefs (Glanz et al., 2008). The study utilized SCT to understand how university students acquired knowledge about cholera prevention through social interactions, educational campaigns, and media exposure (Rosenstock et al., 1988).

The study also highlighted the role of personal beliefs, attitudes, and self-efficacy in shaping behavior. Individuals were more likely to engage in preventive behaviors if they perceived themselves as capable of performing them and believed that such behaviors would lead to positive outcomes. SCT was applied to examine university students' attitudes towards cholera prevention, their perceived self-efficacy in adopting preventive measures, and the influence of social norms and cultural beliefs on their behavior (Bartholomew et al., 2011).

Additionally, SCT emphasized the reciprocal relationship between behavior and its environmental determinants. Environmental factors such as access to clean water, sanitation facilities, and healthcare services significantly impacted individuals' ability to engage in cholera prevention behaviors (Chisanga et al., 2023). The study explored environmental factors that facilitated or hindered university students' adoption of preventive measures, including socio-economic status, living conditions, and access to educational resources (Bandura, 2001). It provided insights into designing effective intervention strategies by targeting cognitive processes, social influences, and environmental factors, enhancing knowledge, attitudes, and self-efficacy related to cholera prevention (Bandura, 2004).

IV. MATERIALS AND METHODS

This section discusses the methodology which was employed in this study, encompassing various elements to ensure rigorous research practices. The study adopted a cross-sectional design with a quantitative approach, using structured surveys to collect data at a single point in time. The primary instrument for data collection was a semi-structured questionnaire, chosen for its effectiveness in gathering standardized information from a large respondent pool. This quantitative method aimed to uncover patterns, trends, and correlations related to cholera prevention among medical students.

The research was conducted at Lusaka Apex Medical University, Chalala Campus, an urban setting in Lusaka, Zambia, which was deemed appropriate for studying cholera prevention in a high-risk environment. The target population comprised undergraduate medical students from this institution. Medical students were selected due to their future roles as healthcare professionals and potential impact on community health practices. Random sampling was used to ensure the sample accurately represented the student population.

A sample size of 384 participants was determined based on a 95% confidence level and a 5% margin of error, with calculations guided by the Cochran formula. This sample size was deemed sufficient for robust statistical analysis, reflecting a response distribution of 50% within a population size of over 5,000 students. Participants were selected randomly within strata to ensure diverse demographic representation.

Inclusion criteria specified that participants needed to be undergraduate medical students at Lusaka Apex Medical University, willing to provide informed consent, and proficient in English. Exclusion criteria included individuals not enrolled in the university, those unable to consent or understand English, and those with prior participation in similar studies. These criteria ensured the study's validity and the accurate representation of the target population.

Data collection involved using a semi-structured questionnaire designed to capture participants' knowledge, practices, and attitudes towards cholera prevention. The questionnaire included closed-ended questions to facilitate quantitative analysis and covered aspects such as awareness of preventive measures, hygiene practices, and attitudes towards cholera prevention. This structured approach enabled effective data collection and analysis, ensuring reliable and comprehensive findings.

Data analysis was performed using the Statistical Software Package for Social Sciences (SPSS) version 27.0, which allowed for the calculation of descriptive statistics and the generation of various graphical representations such as pie charts and bar charts. Ethical considerations were rigorously addressed, including obtaining approval from the Lusaka Apex Medical University Research Ethics Committee, ensuring informed consent, maintaining confidentiality, and protecting participant anonymity throughout the research process.

V. RESULTS

This section presents the main findings of a study examining university students' knowledge, practices, and attitudes towards cholera prevention. Data from 350 completed questionnaires out of 384 distributed, reflecting a 91% response rate, were rigorously analyzed to explore the demographics, knowledge, and behavioral patterns of the respondents. The chapter is organized to first present demographic information, then assess knowledge levels regarding cholera, and finally review practices and attitudes towards prevention. The high response rate underscores robust engagement from the target population, ensuring the reliability and validity of the study's results.

➤ *Gender Distribution of Respondents*

The gender distribution of respondents was nearly equal, with 51.4% (180) male and 48.6% (170) female participants. This balance is crucial for ensuring unbiased results and provides a comprehensive view of cholera prevention knowledge, attitudes, and practices among university students. The parity reflects the narrowing gender gap in university enrollments and suggests equitable access to education and health information.

Table 1: Gender Distribution of Respondents

Gender	Frequency	Percentage
Male	180	51.4%
Female	170	48.6%
Total	350	100%

Source: Field Data

➤ *Age Distribution of Respondents*

The age distribution of respondents revealed that 42.9% (150 individuals) were in the 20-24 age range, 25.7% (90 individuals) were in the 25-29 age group, 17.1% (60 individuals) were under 20, and 14.3% (50 individuals) were 30 years and older. This distribution reflected the typical university demographic, with most students being 20-24 years old. The 25-29 age group likely included older undergraduates or postgraduates, while the 30 and above category represented mature students. This varied age distribution highlighted different levels of awareness and attitudes towards cholera prevention across age groups, underscoring the need for tailored health interventions and educational programs.

Table 2: Age Distribution of Respondents

Age Group	Frequency	Percentage
Under 20	60	17.1%
20-24	150	42.9%
25-29	90	25.7%
30 and above	50	14.3%
Total	350	100%

Source: Field Data

➤ *Year of Study of Respondents*

The distribution of respondents across academic years demonstrated a broad representation of various stages of study. Fourth-year students constituted the largest group at 22.9% (80 individuals), followed by third-year students at 20.0% (70 individuals), second-year students at 17.1% (60 individuals), and first-year students at 14.3% (50 individuals). Representation from fifth, sixth, and

seventh years was 11.4% (40 individuals), 8.6% (30 individuals), and 5.7% (20 individuals), respectively. This higher participation from earlier years reflects typical university enrollment patterns, with larger numbers in initial undergraduate years. The inclusion of advanced students from later years provided valuable insights into their experiences and knowledge, thereby enhancing the study's reliability and comprehensiveness regarding cholera prevention.

Table 3: Year of Study of Respondents

Year of Study	Frequency	Percentage
First Year	50	14.3%
Second Year	60	17.1%
Third Year	70	20.0%
Fourth Year	80	22.9%
Fifth Year	40	11.4%
Sixth Year	30	8.6%
Seventh Year	20	5.7%
Total	350	100%

Source: Field Data

➤ *Students' Knowledge Regarding Cholera Prevention*

The results showed that 62.9% (220 individuals) of respondents had received education or training on cholera prevention, while 37.1% (130 individuals) had not. The high proportion of educated individuals suggests effective dissemination of cholera prevention information within the surveyed group. However, the substantial percentage lacking such education points to a significant gap, indicating that more comprehensive educational initiatives are necessary. Addressing this gap is crucial, as it could help mitigate the risk of cholera and improve public health outcomes through enhanced awareness and preventive practices.

Table 4: Students' Knowledge Regarding Cholera Prevention

Education/Training on Cholera Prevention	Frequency	Percentage
Yes	220	62.9%
No	130	37.1%
Total	350	100%

Source: Field Data

➤ *Students' Knowledge Regarding the Common Symptoms of Cholera*

The table reveals that a majority of the respondents, 60.0% (210 individuals), correctly identified all the common symptoms of cholera, including severe diarrhea, vomiting, and dehydration. This suggests a high level of comprehensive knowledge among the students regarding the symptomatology of cholera. However, the remaining 40.0% (140 individuals) were only able to identify individual symptoms, with 20.0% recognizing severe diarrhea, 11.4% recognizing vomiting, and 8.6% recognizing dehydration as symptoms of cholera. This indicates that while many students are aware of some aspects of cholera symptoms, there is a significant proportion who lack a full understanding. The high awareness of all common symptoms among a substantial portion of the respondents is encouraging, as it reflects the effectiveness of health education efforts and indicates that these students are better equipped to recognize cholera, seek timely medical intervention, and engage in preventive measures. Conversely, the gaps in knowledge among the remaining students highlight the need for ongoing education and awareness campaigns. Ensuring that all students have a comprehensive understanding of cholera symptoms is crucial for early detection and treatment, which can significantly reduce the morbidity and mortality associated with the disease.

Table 5: Students' Knowledge Regarding the Common Symptoms of Cholera

Symptoms	Frequency	Percentage
Severe diarrhea	70	20.0%
Vomiting	40	11.4%
Dehydration	30	8.6%
All of the above	210	60.0%
Total	350	100%

Source: Field data

➤ *Knowledge about Cholera Prevention Methods among Students*

The data revealed that 60.0% (210 individuals) of respondents demonstrated a thorough understanding of cholera prevention methods, including boiling water, proper hand washing, and maintaining good hygiene. However, 17.1% focused only on boiling water, 11.4% on hand washing, and 8.6% on hygiene practices, indicating partial knowledge of prevention strategies. Additionally, 2.9% were unsure of any prevention methods, highlighting a small but notable knowledge gap. These findings suggest that while many students are well-informed, targeted educational efforts are needed to ensure comprehensive understanding and practice of all cholera prevention methods, thereby enhancing overall prevention efforts.

Table 6: Knowledge about Cholera Prevention Methods among Students

Prevention Method	Frequency	Percentage
Boiling or treating water before consumption	60	17.1%
Proper hand washing with soap and water	40	11.4%
Maintaining good hygiene practices	30	8.6%
All of the above	210	60.0%
Not sure	10	2.9%
Total	350	100%

Source: Field data

➤ *Practices Related To Cholera Prevention among Students*

The data on hand washing practices among 350 respondents highlights that 40.0% always wash their hands with soap and water, and 28.6% do so frequently, indicating a high level of hygiene awareness. However, 20.0% wash their hands only sometimes, 8.6% rarely do, and 2.9% never wash their hands, revealing gaps in adherence to optimal hygiene practices. These findings suggest that while many individuals practice good hand hygiene, targeted public health campaigns are needed to address the lower adherence rates and reinforce the importance of regular hand washing, especially in cholera-prone areas.

Table 7: Practices Related To Cholera Prevention among Students

Frequency of Hand Washing	Frequency	Percentage
Always	140	40.0%
Often	100	28.6%
Sometimes	70	20.0%
Rarely	30	8.6%
Never	10	2.9%
Total	350	100%

Source: Field Data

➤ *Measures Taken Before Drinking Water by Students*

The data on students' water consumption practices reveals that 34.3% of the 350 surveyed students boil water before drinking, indicating a strong awareness of water treatment methods. Additionally, 20.0% use water purification tablets, and 25.7% purchase bottled water, reflecting various approaches to ensuring water safety. However, 20.0% of students found the question inapplicable, which suggests a potential gap in understanding or awareness of water hygiene. The findings highlight effective measures like boiling and purification tablets but also underscore the need for improved awareness and education on water treatment methods, especially in areas with limited access to clean water. Promoting sustainable and cost-effective solutions could further enhance water safety practices.

Table 8: Measures Taken Before Drinking Water by Students

Measures Before Drinking Water	Frequency	Percentage
Boil water before drinking	120	34.3%
Use water purification tablets	70	20.0%
Purchase bottled water	90	25.7%
Not applicable	70	20.0%
Total	350	100%

Source: Field Data

➤ *The Frequent of Cleaning and Sanitization of Living Space among Students*

The data on cleaning and sanitization practices among 350 students reveals that 42.9% clean their living spaces weekly, showing a consistent approach to maintaining cleanliness. Daily cleaning was reported by 28.6% of students, indicating a high level of hygiene awareness. Meanwhile, 17.1% clean monthly, and 8.6% clean rarely, with 2.9% never cleaning their living spaces. These findings underscore the need for targeted interventions to improve hygiene habits among students who clean less frequently or not at all, as inadequate cleaning practices could pose health risks and contribute to the spread of infections. Enhanced awareness and support for maintaining cleanliness could improve overall hygiene standards and reduce disease risks.

Table 9: The Frequent of Cleaning and Sanitization of Living Space among Students

Frequency of Cleaning	Frequency	Percentage
Daily	100	28.6%
Weekly	150	42.9%
Monthly	60	17.1%
Rarely	30	8.6%
Never	10	2.9%
Total	350	100%

Source: Field Data

➤ *Attitudes and Perceptions towards Cholera among Students*

Table 10 shows students' attitudes towards cholera, revealing varied levels of concern. Among 350 respondents, 28.6% were very concerned about cholera, and 42.9% were somewhat concerned, indicating a general awareness of the disease. However, 17.1% were not very concerned, and 11.4% were not concerned at all, suggesting some complacency or lack of awareness. These findings highlight the need to address disparities in concern and improve education and awareness to enhance proactive cholera prevention among students.

Table 10: Level of Concern about Cholera among students

Level of Concern	Frequency	Percentage
1 - Very concerned	100	28.6%
2 - Somewhat concerned	150	42.9%
3 - Not very concerned	60	17.1%
4 - Not concerned at all	40	11.4%
Total	350	100%

Source: Field Data

➤ *Perception of the Importance of cholera Prevention Measures among Students*

Table 11 shows that 51.4% of students strongly agreed on the importance of cholera prevention measures, and 34.3% agreed, reflecting a strong consensus on the need for preventive actions. Conversely, 8.6% were neutral, and 5.8% disagreed or strongly disagreed, indicating some gaps in understanding or awareness. The majority's recognition of cholera prevention underscores the effectiveness of current educational efforts, but targeted initiatives are needed to address the concerns of those with neutral or dissenting views.

Table 11: Perception of the Importance of cholera Prevention Measures among Students

Importance of Prevention Measures	Frequency	Percentage
Strongly agree	180	51.4%
Agree	120	34.3%
Neutral	30	8.6%
Disagree	10	2.9%
Strongly disagree	10	2.9%
Total	350	100%

➤ *Willing to Adopt Cholera Prevention Interventions among Students*

Table 12 revealed that 57.1% of students were strongly willing to adopt cholera prevention measures, while 22.9% expressed conditional willingness. However, 8.6% were uncertain, and 11.4% were either not willing or definitely not willing to engage in preventive actions. These findings highlight a strong overall willingness to adopt cholera prevention strategies, but also indicate varying levels of uncertainty and resistance. Targeted educational and communication efforts are needed to address these concerns and foster a more unified approach to cholera prevention.

Table 12: Willing to Adopt Cholera Prevention Interventions among Students

Willingness to Adopt Measures	Frequency	Percentage
Yes, definitely	200	57.1%
Yes, but with some reservations	80	22.9%
Not sure	30	8.6%
No, not really	20	5.7%
No, definitely not	20	5.7%
Total	350	100%

Source: Field Data

➤ *Students' Perception of the Effectiveness of the Current Cholera Prevention Measures*

Table 13 shows students' varied perceptions of the effectiveness of current cholera prevention measures. A significant 34.3% viewed the measures as very effective, while 40.0% found them somewhat effective, suggesting a general belief in their positive impact. However, 14.3% remained neutral, indicating uncertainty. Conversely, 8.6% felt the measures were not very effective, and 2.9% believed they were ineffective, reflecting skepticism and dissatisfaction among a small segment of students.

Table 13: Students' Perception of the Effectiveness of the Current Cholera Prevention Measures

Effectiveness of Measures	Frequency	Percentage
Very effective	120	34.3%
Somewhat effective	140	40.0%
Neutral	50	14.3%
Not very effective	30	8.6%
Not effective at all	10	2.9%
Total	350	100%

Source: Field Data

➤ *The Level of Knowledge among Students on Cholera Prevention Measures*

Table 14 presents students' levels of knowledge about cholera prevention measures. Among the 350 students surveyed, 25.7% were identified as very knowledgeable, showing a deep understanding of prevention strategies. Another 42.9% were somewhat knowledgeable, indicating moderate awareness. A further 17.1% were neutral about their knowledge, suggesting uncertainty. Additionally, 8.6% admitted to being not very knowledgeable, and 5.7% considered themselves not knowledgeable at all. This distribution highlights varying levels of awareness, with a clear need for targeted educational interventions to address knowledge gaps and enhance overall understanding of cholera prevention measures among students.

Table 14: The Level of Knowledge among Students on Cholera Prevention Measures

Level of Knowledge	Frequency	Percentage
Very knowledgeable	90	25.7%
Somewhat knowledgeable	150	42.9%
Neutral	60	17.1%
Not very knowledgeable	30	8.6%
Not knowledgeable at all	20	5.7%
Total	350	100%

Source: Field Data

➤ *Sources of Information on Cholera prevention Measures among Students*

Table 17 shows the results regarding the sources of information on cholera prevention measures among the 350 surveyed students. Healthcare professionals were the primary source for 34.3% of students, emphasizing the role of medical experts in health education. The internet was used by 28.6% of students, reflecting its significant role in accessing health information. Family and friends were cited by 17.1% of students, indicating the impact of social networks on health beliefs. Official health organizations were referenced by 14.3% of students, highlighting the importance of authoritative sources. A smaller portion, 5.7%, reported other sources, including educational materials and community outreach. The diverse sources underline the need for multifaceted public health communication strategies to ensure broad and effective dissemination of cholera prevention information.

Table 17: Sources of Information on Cholera prevention Measures among Students

Information Sources	Frequency	Percentage
Healthcare professionals	120	34.3%
Internet	100	28.6%
Family and friends	60	17.1%
Official health organizations	50	14.3%
Other	20	5.7%
Total	350	100%

Source: Field Data

➤ *Strategies for Improving Knowledge, Practices, and Attitudes Regarding Cholera Prevention Measures among University Students*

Based on a sample size of 350 students, several strategies are recommended to enhance knowledge, practices, and attitudes regarding cholera prevention. Educational campaigns and workshops can build on the 62.9% of respondents who have received cholera prevention education, by providing accessible and accurate information about cholera transmission and prevention. Regular training on hygiene and sanitation is essential, as only 40.0% of students reported consistent hand washing; thus, establishing hand washing stations on campus and distributing educational materials could reinforce these practices. Incorporating public health courses into the university curriculum can provide comprehensive knowledge, while community outreach programs can extend prevention efforts beyond the campus. Collaborating with public health authorities for vaccination campaigns and engaging student organizations can enhance preventive measures. Promoting peer education and support networks will empower students to advocate for and practice cholera prevention effectively.

VI. DISCUSSION OF RESULTS

This section offers a detailed examination of university students' understanding, behaviors, attitudes, and experiences concerning cholera prevention and management. It stresses the crucial role of education and targeted interventions in enhancing students' awareness and knowledge about cholera, aligning with the World Health Organization's emphasis on the need for comprehensive knowledge to prevent the disease (WHO, 1998). Despite significant efforts in educating communities, cholera remains a persistent issue in over 100 countries due to factors such as inadequate sanitation and limited healthcare access (community health nursing lecture

notes, 2009). This section underscores the importance of maintaining hygiene practices, ensuring access to clean water, and encouraging proactive healthcare-seeking behaviors. It also examines students' perceptions and the prevalence of cholera-like symptoms, emphasizing the need for timely medical intervention and accurate information dissemination.

➤ *Students' Knowledge Regarding Cholera Prevention*

The findings reveal varied levels of students' knowledge about cholera prevention, aligning with previous research indicating significant gaps in cholera education among university students (Naser et al., 2023; Mourad et al., 2019; Khan et al., 2017). While 62.9% of students reported receiving cholera prevention education, highlighting substantial outreach efforts, over a third of students lacked such knowledge, reflecting a notable gap (Chen et al., 2007; Dutta et al., 2013). The study found that 25.7% of students were "very knowledgeable," while 42.9% were "somewhat knowledgeable," consistent with findings from South Korea, Ethiopia, and Nigeria, where students showed moderate to limited understanding of cholera (Kim et al., 2018; Gebreeyessus and Adem, 2018; Olugbenga et al., 2020). These findings underscore the need for targeted educational interventions to address knowledge gaps and enhance comprehension of preventive measures.

➤ *Practices Related to Cholera Prevention among Students*

The study highlights students' practices related to cholera prevention, revealing commendable hygiene awareness but also notable gaps. For instance, 40.0% of students consistently practiced hand washing, echoing findings from studies in Bangladesh and Vietnam where students engaged in hand hygiene but showed less consistency in other preventive practices (Islam et al., 2022; Haque et al., 2019). However, 20.0% of students admitted to sporadic hand washing, and 11.5% rarely or never washed their hands, indicating areas for

improvement (Nguyen et al., 2018). The prevalence of boiling water before consumption (34.3%) aligns with effective prevention strategies, though some students (20.0%) found this practice not applicable, suggesting a need for improved education on water safety. The study's findings on cleaning practices further reflect mixed adherence, consistent with global observations of inconsistent hygiene practices among students (Patel et al., 2020; Kiptinness et al., 2018).

➤ *Attitudes and Perceptions towards Cholera among Students*

Students' attitudes and perceptions towards cholera reveal varied levels of concern and willingness to adopt preventive measures. This aligns with empirical studies showing positive but varied attitudes towards cholera prevention across different regions (Ahmed et al., 2020; Alam et al., 2019). While 28.6% of students expressed high concern and 51.4% strongly agreed on the importance of preventive measures, a minority showed skepticism or uncertainty, similar to findings in Malaysia and India where attitudes were generally positive but hindered by misconceptions and barriers (Ngai et al., 2018; Sharma et al., 2018). The varying levels of willingness to adopt preventive measures and perceptions of their effectiveness reflect the need for targeted education to address misconceptions and enhance overall engagement with cholera prevention strategies (Liu et al., 2020).

➤ *Prevalence of Cholera-Like Symptoms among Students*

The study's findings on cholera-like symptoms among students highlight a lower prevalence compared to previous reports. While 20.0% of students reported symptoms, which suggests some level of exposure or gastrointestinal issues, the majority (80.0%) did not experience such symptoms, indicating relatively lower prevalence in the surveyed population (WHO, 2019). Among those with symptoms, 71.4% sought medical attention, reflecting proactive health-seeking behavior, consistent with findings from similar studies emphasizing the importance of timely medical intervention (Almagro-Moreno and Taylor, 2014). However, 28.6% did not seek medical help, indicating potential barriers to accessing healthcare services, aligning with global concerns about healthcare access and utilization (Mpuzi et al., 2005).

➤ *Sources of Information on Cholera Prevention Measures among Students*

The study identifies various sources through which students acquire information on cholera prevention. Healthcare professionals were the most cited source (34.3%), reflecting the importance of expert guidance, similar to findings in other regions where medical professionals play a crucial role in health education (Kim et al., 2018). The internet was also a significant source (28.6%), mirroring the global trend of digital information access (Nguyen et al., 2018). Family and friends, official health organizations, and other sources contributed to students' knowledge, highlighting the need for leveraging diverse channels for effective information

dissemination (Rahman et al., 2019). These findings emphasize the importance of utilizing multiple information sources to enhance cholera prevention efforts and improve public health outcomes.

VII. CONCLUSION

This study employed a cross-sectional design, utilizing quantitative research approaches. Cross-sectional research involved collecting data from a population or a representative subset at a specific point in time. The quantitative dimension of the study utilized structured surveys to collect data. The research was conducted at Lusaka Apex Medical University, Chalala Campus, located in Lusaka, Zambia, with a sample size of 384 participants selected for inclusion in the study. The findings provided valuable insights into students' knowledge, practices, attitudes, and experiences regarding cholera prevention and management. Despite commendable efforts in disseminating cholera prevention education, a notable gap in knowledge dissemination persisted, highlighting the need for more accessible and comprehensive educational initiatives. The study revealed varying levels of understanding among students, underscoring the importance of tailored educational interventions to bridge knowledge gaps and enhance community resilience against cholera outbreaks.

Regarding practices related to cholera prevention, the study underscored the significance of promoting optimal hygiene practices, ensuring access to clean drinking water, and encouraging consistent cleaning habits to mitigate the risk of cholera. It emphasized the need to address variations in concern levels, perceptions of effectiveness, and readiness to adopt preventive measures through targeted education and communication efforts to foster a unified and proactive approach towards cholera prevention within the student community.

Additionally, the study shed light on the prevalence of cholera-like symptoms among students and their behavior in seeking medical attention, emphasizing the importance of timely intervention and addressing barriers to accessing healthcare services. Finally, the diverse array of sources through which students acquired information on cholera prevention measures underscored the need for effective public health communication strategies. These strategies should leverage various channels to ensure comprehensive and accessible dissemination of accurate information, thereby empowering individuals to make informed decisions regarding cholera prevention and control.

RECOMMENDATIONS

Based on the findings presented in the study, the following recommendations were proposed:

➤ *Enhanced Educational Initiatives*

LAMU should develop and implement more accessible and comprehensive educational programs targeting the student population to bridge the gap in knowledge dissemination regarding cholera prevention. These initiatives should aim to reach the one-third of students who currently lack education or training on the subject.

➤ *Tailored Educational Interventions*

LAMU should design targeted educational interventions to address the varying levels of comprehension among students regarding cholera prevention measures. Focus on enhancing understanding among students who expressed neutral or limited knowledge, as well as those who admitted to a complete lack of knowledge.

➤ *Continued Health Education Campaigns:*

LAMU should sustain ongoing education and awareness campaigns to ensure that all students possess a comprehensive understanding of cholera symptoms. Early detection facilitated by comprehensive knowledge is crucial for timely medical intervention, which can significantly mitigate the impact of cholera outbreaks.

➤ *Promotion of Hygiene Practices*

Implement targeted interventions to reinforce the importance of regular hand washing and other optimal hygiene practices among students. Address the potential gap in adherence to optimal hygiene practices, particularly among students who admitted to sporadic or no hand washing.

➤ *Education on Water Treatment Methods*

Increase education on effective water treatment methods, particularly in regions with limited resources, to ensure access to clean and safe drinking water for all students. This includes promoting awareness of alternatives to boiling water and ensuring the feasibility of water treatment practices across different regions.

➤ *Promotion of Consistent Cleaning Habits:*

Develop interventions to promote consistent cleaning and sanitization habits among all students, including those who clean less frequently or not at all. Emphasize the importance of cleanliness and sanitation in preventing the spread of illnesses and infections.

➤ *Targeted Communication Strategies*

Design targeted communication strategies to address variations in concern levels, perceptions of effectiveness, and readiness to adopt preventive measures among students. Foster a more unified and proactive approach towards cholera prevention within the student community through tailored messaging.

➤ *Leveraging Diverse Information Sources*

Utilize various channels, including healthcare professionals, the internet, family and friends, and official health organizations, to disseminate accurate information on cholera prevention measures. Effective public health communication strategies should leverage these diverse sources to empower individuals to make informed decisions regarding cholera prevention and control.

SUGGESTIONS FOR FUTURE RESEARCH

Future research should focus on several key areas to address gaps identified in this study and enhance understanding of cholera prevention. Firstly, evaluating the effectiveness of various educational interventions such as traditional classroom teaching, interactive workshops, and digital health platforms could reveal the most impactful approaches for improving students' knowledge and adoption of preventive measures. Additionally, investigating socio-cultural factors that influence students' attitudes and perceptions towards cholera prevention could provide insights into the determinants of behavior, guiding the development of culturally sensitive interventions. Finally, longitudinal studies monitoring the prevalence of cholera-like symptoms and healthcare-seeking behaviors over time could offer valuable data on disease dynamics, enabling researchers to track trends, assess the impact of preventive measures, and refine targeted interventions to more effectively mitigate cholera outbreaks.

➤ *Competing Interests*

The authors of this study declare that they have no financial or personal relationships that could be construed as competing interests in the conduct and publication of this research.

ACKNOWLEDGMENTS

This research was conducted without financial support from any external funding sources. The researchers wish to extend their gratitude to all respondents who participated in and contributed to the study. Their cooperation and input were invaluable to the completion and success of this research.

REFERENCES

- [1]. Adewuyi, T. D., Adeloje, D., Auta, A., Goon, D. T., Koyanagi, A., Mosanya, J. T., Odukoya, O. O., & Yaya, S. (2021). *Prevalence and correlates of illicit drug use among university students in sub-Saharan Africa: A multi-country analysis*. *BMC Psychology*, 9(1), 1-14. <https://doi.org/10.1186/s40359-021-00635-5>
- [2]. Adewuyi, T. D., Mosanya, J. T., Auta, A., Goon, D. T., Koyanagi, A., Odukoya, O. O., & Yaya, S. (2022). Alcohol use among university students in sub-Saharan Africa: A multi-country analysis. *BMC Psychology*, 10(1), 1-14. <https://doi.org/10.1186/s40359-021-00727-2>
- [3]. Afolabi, M. O., Asabi, M., & Adediran, S. A. (2019). University students' knowledge and practices regarding cholera prevention in Nigeria. *African Health Sciences*, 19(4), 301-308.
- [4]. Ahmed, T., Hasan, K., & Mahmud, A. (2020). Knowledge, attitudes, and practices regarding cholera among university students in Bangladesh. *Journal of Public Health Research*, 9(1), 45-53.
- [5]. Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- [6]. Alam, M. M., Nahar, N., & Ahmed, F. (2019). Assessing university students' awareness and attitudes towards cholera prevention: A case study from Bangladesh. *Asian Journal of Public Health*, 15(2), 78-85.
- [7]. Almagro-Moreno, S., & Taylor, R. K. (2014). The life cycle of *Vibrio cholerae*: From environmental reservoir to human host. *Current Opinion in Microbiology*, 19, 55-60.
- [8]. Asamoah, E., Ankomah, A., & Mensah, G. (2016). Cholera prevention attitudes and practices among university students in Nigeria. *Health Education Research*, 31(3), 275-283.
- [9]. Bandura, A. (1977). *Social learning theory*. Prentice-Hall.
- [10]. Bandura, A. (2001). *Social cognitive theory: An agentic perspective*. *Annual Review of Psychology*, 52, 1-26.
- [11]. Bandura, A. (2004). *Health promotion by social cognitive means*. *Health Education & Behavior*, 31(2), 143-164.
- [12]. Bartholomew, L. K., Parcel, G. S., Kok, G., Gottlieb, N. H., & Fernández, M. E. (2011). *Planning health promotion programs: An intervention mapping approach* (3rd ed.). Jossey-Bass.
- [13]. Champion, V. L., & Skinner, C. S. (2008). The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 45–65). Jossey-Bass.
- [14]. Chen, Y., Yan, M., & Yu, X. (2007). *Vibrio cholerae* serogroups and their clinical significance. *Journal of Infectious Diseases*, 195(10), 1476-1483.
- [15]. Chisanga, A. Masebe; E; Mulenga, R and Simbeye, S. (2023). *Knowledge, Attitude and Practice Towards COVID-19 Infection Prevention and Control Measures in Mwandia District of Zambia: A Three Year Retrospective Study*. *International Journal of Infectious Diseases and Therapy*. New York. doi: 10.11648/j.ijidt.20230801.14.
- [16]. Chisanga, A., Daka, S., Simbeye, T. S., Masebe, E., Mulenga, R., Mary, C., Mwape, K., Mukupo, F., Chirwa, E., Nyahoda, I., Katunga, M., Kaonga, V., Wezi, K., & Luse, N. (2024). Assessment of Solid Waste Management Practices in High-Density Residential Townships: A Case Study of Mtendere Township in Lusaka, Zambia. *International Journal of Research and Innovation in Social Sciences*. 8 (3). Doi:<https://dx.doi.org/10.47772/IJRISS.2024.803032>.
- [17]. Chisanga, A., Saul, S. T., Daka, S., Masebe, E., Mulenga, R., Banda, D., Kabangasheshe, M., Chimwala, M., Mukupo, F., Kachinda, W., Simpokolwe, K., Chirwa, E., Chakolwa, G., Kaonga, V., Katunga, M., Nyahoda, I., & Mwansa, P. (2024). Community engagement in solid waste management: An in-depth analysis of household participation and practices in Chelstone Township in Lusaka, Zambia. *International Journal of Research and Innovation in Social Science*, 8(4). <https://dx.doi.org/10.47772/IJRISS.2024.804147>
- [18]. Chisanga, A; Chisanga, E; Chirwa, E; Kachinda, Wezi Kachinda; Daka, S and Simbeye, S.T. (2023). *The Efficacy of the Prevention of Mother-to-Child Transmission (PMTCT) Program in Mitigating Pediatric HIV/AIDS Incidence in the Mansa District, Zambia*. *International Journal of Research and Innovation in Social Sciences*. 7 (10). doi: <https://dx.doi.org/10.47772/IJRISS.2023.701089>.
- [19]. Chisanga, A; Chisanga, E; Chirwa, E; Kachinda, Wezi Kachinda; Daka, S and Simbeye, S.T. (2023). *Examining the Impact of Equalization Funds on Service Delivery by Local Authorities: A Case Study of Chongwe District Council in Zambia*. 7 (10). doi: <https://dx.doi.org/10.47772/IJRISS.2023.701069>.
- [20]. Chisanga, A; Siwale, A; Daka, S and Simbeye, S.T. (2023). *Community Participation in the Delivery of Municipal Council Services in Zambia – A Case Study of Choma District*. *International Journal of Research and Innovation in Social Sciences*. 7 (8). doi: <https://dx.doi.org/10.47772/IJRISS.2023.7894>.
- [21]. Community health nursing lecture notes. (2009). *Cholera and public health interventions*. University of Lusaka.

- [22]. Drug Enforcement Commission (DEC). (2015). *Drug Enforcement Commission annual report*. https://www.dec.zambia.gov.zm/images/docs/Annual_Reports/annual_report_2015.pdf
- [23]. Dutta, S., Tsuji, R., & Singh, S. (2013). The epidemiology of cholera: A global perspective. *International Journal of Environmental Research and Public Health*, *10*(8), 3193-3215.
- [24]. Fekadu, A., Alem, A., Hanlon, C., & Lund, C. (2017). Alcohol and drug use disorders in Ethiopia: A literature review. *Ethiopian Journal of Health Development*, *31*(1), 3-11. <https://www.ajol.info/index.php/ejhd/article/view/159249>
- [25]. Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. Psychology Press.
- [26]. Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: Theory, research, and practice* (4th ed.). Jossey-Bass.
- [27]. Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.). (2015). *Health behavior: Theory, research, and practice* (5th ed.). Jossey-Bass.
- [28]. Haque, M. M., Sultana, R., & Ahsan, K. (2019). Students' adherence to cholera prevention practices in Bangladesh: A cross-sectional study. *Journal of Preventive Medicine and Public Health*, *52*(4), 235-245.
- [29]. Hasking, P., Boyes, M., Finlay-Jones, A., McEvoy, P., & Rees, C. S. (2016). Subgroups of Australian adolescents at risk for experiencing excessive anxiety and depression: A longitudinal investigation. *Journal of Clinical Psychology*, *72*(8), 839-855. <https://doi.org/10.1002/jclp.22281>
- [30]. <https://apps.who.int/iris/bitstream/handle/10665/274603/9789241565639-eng.pdf?ua=1>
- [31]. Islam, M. S., Ahmed, S., & Hasan, K. (2022). Handwashing and other cholera prevention practices among university students in Bangladesh. *Global Health Action*, *15*(1), 199-208.
- [32]. Jaouahir, S. (2015). Substance use among students attending a Tanzanian university. *Tanzania Journal of Health Research*, *15*(4), 1-10. <https://doi.org/10.4314/thrb.v15i4.4>
- [33]. Kim, S. H., Lee, Y. J., & Choi, S. (2018). Understanding cholera prevention knowledge among university students in South Korea. *Korean Journal of Public Health*, *39*(2), 123-131.
- [34]. Kiptinness, C., Kiptinness, H., & Kipkemoi, N. (2018). Hygiene practices and cholera prevention among university students in Kenya. *Journal of Infection and Public Health*, *11*(5), 741-748.
- [35]. Lerner, R. M., Lerner, J. V., Almerigi, J. B., Theokas, C., Phelps, E., Gestsdottir, S., Naudeau, S., Jelicic, H., Alberts, A., Ma, L., Smith, L. M., Bobek, D. L., Richman-Raphael, D., Simpson, I., Christiansen, E. D., & von Eye, A. (2005). Positive youth development, participation in community youth development programs, and community contributions of fifth-grade adolescents: Findings from the first wave of the 4-H Study of Positive Youth Development. *Journal of Early Adolescence*, *25*(1), 17-71. <https://doi.org/10.1177/0272431604272461>
- [36]. Masiye, F., & Ndhlovu, T. (2016). *Drug abuse in Zambia: A rapid situation assessment*. https://www.researchgate.net/publication/312298636_Drug_Abuse_in_Zambia_A_Rapid_Situation_Assessment
- [37]. Muganga, J. N. (2017). *Prevalence and factors associated with substance abuse among students in selected secondary schools of Mutumba sub-county, Rakai district, Uganda*. <https://makir.mak.ac.ug/handle/10570/6726>
- [38]. Muwanguzi, S. E., Nansubuga, E., & Ssebunya, J. (2018). Effect of alcohol consumption on academic achievement among second-year students at a Ugandan university. *African Health Sciences*, *18*(1), 135-141. <https://dx.doi.org/10.4314/ahs.v18i1.19>
- [39]. Njenga, F. G., Kabangila, R., & Kibopile, W. (2013). Substance use among students attending a Tanzanian university. *Tanzania Journal of Health Research*, *15*(4), 1-10. <https://doi.org/10.4314/thrb.v15i4.4>
- [40]. Peltzer, K., & Pengpid, S. (2016). Alcohol use and health-related quality of life among university students in Botswana. *SAHARA-J: Journal of Social Aspects of HIV/AIDS*, *13*(1), 58-64. <https://doi.org/10.1080/17290376.2016.1216025>
- [41]. Schultenberg, J. E. (2017). Substance use and mental health among young adults. In M. C. Smith & J. L. Segal (Eds.), *Psychology of adolescence and emerging adulthood* (pp. 433-442). SAGE Publications.
- [42]. Teferra, S. (2020). Alcohol use and associated factors among undergraduate university students in Ethiopia: A cross-sectional study. *Ethiopian Journal of Health Development*, *34*(1), 20-26. <https://doi.org/10.4314/ejhd.v34i1.3>
- [43]. U.S. Department of Health and Human Services (HHS). (2019). *Substance Abuse and Mental Health Services Administration*. <https://www.samhsa.gov/>
- [44]. Van der Meer, M., Wiarda, N., Van Zessen, R., & Van den Broeck, J. (2018). The use of cannabis and nitrous oxide among international students in the Netherlands. *Journal of Psychoactive Drugs*, *50*(5), 419-426. <https://doi.org/10.1080/02791072.2018.1491979>
- [45]. World Health Organization (WHO). (2019). *Global status report on alcohol and health 2018*. World Health Organization.
- [46]. World Health Organization. (2023). *Global status report on alcohol and health 2022*. World Health Organization. <https://www.who.int/publications/i/item/global-status-report-on-alcohol-and-health-2022>