DOI: https://doi.org/10.67203/gjhrr.2025.5n15mh6c

https://abueducationjournals.com/gjhrr Volume 7, Issue 2 August 2025

ASSESSMENT OF ATTITUDE TOWARD TOILET INFECTION PREVENTIVE MEASURES AMONG BOARDING SECONDARY SCHOOL STUDENTS IN NORTH EAST, NIGERIA

[*]H. S. Akundo, D. O. Ajeibi, and E. Akyoba

Department of Human Kinetics and Health Education, Taraba State University, Jalingo, Nigeria
[*]Corresponding Author: solomonhannatu2@gmail.com; 07035579772

Abstract

The study assessed the attitude toward toilet infection preventive measures among boarding secondary school students in North East, Nigeria. To achieve this purpose, descriptive survey research design was used. The population for this study was twenty-five thousand seven hundred and seventy-three (25,773) female students in boarding secondary schools across North-East Nigeria. The sample size of 378 was selected using multistage sampling procedures which include stratified, simple random, purposive, and proportionate sampling. The instrument for data collection was a structured questionnaire developed by the researcher. The instrument was pilot-tested using Cronbach Alpha and a 0.851 reliability coefficient was obtained. The Descriptive statistics of frequency and simple percentages were used to analyze the demographic characteristics of the respondents. Inferential statistics of one-sampled t-test was used to test the stated hypothesis at a 0.05 level of significance. The result revealed that the attitude toward toilet infection preventive measures is significant ($t = 21.129$; $p = 0.000$). Based on the results, the study concluded that boarding secondary school students in North East, Nigeria have positive attitudes towards toilet infection preventive measures. Based on the conclusion, the study recommends among others the need for the school administrators to implement comprehensive educational programmes to reinforce and maintain the high level of knowledge among boarding secondary school students in North East, Nigeria regarding toilet infection preventive measures.

Keywords: Attitude, Toilet Infection, Preventive Measures, Boarding School Students

Introduction

Toilet infections, also known as urinary tract infections (UTIs) or hygiene-related infections, are a significant public health concern globally, particularly in settings where sanitation and hygiene practices are suboptimal. These infections are often caused by poor toilet hygiene, inadequate sanitation facilities, and a lack of awareness about preventive measures (Akorede & Toyin, 2020). According to the World Health Organization [WHO] (2022), over 1.7 billion people worldwide lack access to basic sanitation services, and approximately 297,000 children under five die annually due to diarrheal diseases linked to poor sanitation and hygiene. Toilet infections, though preventable, remain a persistent issue, especially in low- and middle-income countries where access to clean water and sanitation is limited (Solomon et al., 2025). The burden of these infections is exacerbated in crowded environments such as boarding schools, where shared facilities and poor maintenance can increase the risk of transmission (Kabiru et al., 2024; Solomon et al., 2025).

In Africa, the situation is particularly dire, with millions of people lacking access to improved sanitation facilities. The United Nations Children's Fund (UNICEF, 2021) reports that 27% of schools in sub-Saharan Africa have no sanitation facilities, and 23% have facilities that are not functional. This lack of access contributes to the high prevalence of toilet infections among school-aged children. In countries like Kenya, Uganda, and Tanzania, studies have shown that poor sanitation in schools is a leading cause of absenteeism due to infections such as UTIs and diarrheal diseases (Mugo et al., 2020; Njuguna et al., 2021). For instance, a study in Kenya revealed that 45% of school-going children reported experiencing at least one episode of UTI in the past year, with poor toilet hygiene being a significant contributing factor (Mugo et al., 2020).

Nigeria, as Africa's most populous nation, faces significant challenges in addressing toilet infections, particularly in its boarding secondary schools. According to the National Bureau of Statistics (NBS, 2021), only 44% of Nigerians have access to basic sanitation services, and 24% still practice open defecation. In schools, the situation is even worse, with many institutions lacking adequate toilet facilities or maintaining them poorly (Abdulbaqi et al., 2019; Akorede et al., 2020; Akorede et al., 2023; Idris et al., 2022). A study conducted in Lagos State revealed that 60% of secondary schools had insufficient toilet facilities, and 70% of students reported using unclean toilets (Adeyemi et al., 2020). This has led to a high prevalence of toilet infections among students, with studies indicating that 35% of boarding school students in Nigeria have experienced at least one episode of UTI in the past year (Oluwafemi et al., 2019). The lack of proper sanitation facilities and poor hygiene practices in these schools contribute significantly to the spread of infections (Nofiu et al., 2021; Akorede et al., 2020; Akorede et al., 2023).

Preventive measures for toilet infections include proper handwashing with soap, regular cleaning of toilet facilities, and the use of clean water for personal hygiene (Akorede et al., 2023; Akorede & Toyin, 2020; Solomon et al., 2025). The WHO (2022) emphasizes the importance of handwashing as a cost-effective intervention to reduce the transmission of infections. Additionally, the provision of adequate and gender-separated toilet facilities in schools is critical to promoting hygiene and reducing the risk of infections. Educational programs that teach students about the importance of personal hygiene and the proper use of toilet facilities are also essential in preventing infections (Biu et al., 2025). However, the implementation of these

measures remains a challenge in many Nigerian boarding schools due to inadequate funding, poor infrastructure, and lack of awareness among students and staff.

The attitude of students towards toilet infection preventive measures plays a crucial role in determining the effectiveness of these interventions. Attitudes are shaped by knowledge, cultural beliefs, and the availability of resources. In many cases, students may be aware of the importance of hygiene but fail to practice it due to a lack of facilities or peer influence. For instance, a study in Ghana found that although 80% of students knew the importance of handwashing, only 30% practised it regularly due to the unavailability of soap and water (Addo et al., 2021). Similarly, in Nigeria, cultural beliefs and misconceptions about hygiene often hinder the adoption of preventive measures.

Previous studies have explored the attitudes of students towards hygiene and sanitation in various contexts. For example, a study in India found that students who received hygiene education were more likely to practice handwashing and maintain clean toilet facilities (Patil et al., 2020). In Nigeria, a study by Oluwafemi et al. (2019) revealed that students who had access to clean toilets and handwashing facilities were less likely to report toilet infections. However, there is a paucity of research focusing specifically on the attitudes of boarding secondary school students in North East Nigeria towards toilet infection preventive measures. This region, which has been affected by insurgency and displacement, faces unique challenges in providing adequate sanitation facilities and promoting hygiene practices.

The problem of toilet infections in Nigerian boarding schools is multifaceted, involving issues of infrastructure, education, and cultural practices. Despite the availability of preventive measures, many schools lack the resources to implement them effectively. The researchers observed that students often use unclean and overcrowded toilet facilities, which increases their risk of infections. Additionally, there is a lack of awareness among students about the importance of personal hygiene and the proper use of toilet facilities. The high prevalence of toilet infections among boarding school students in North East Nigeria is a cause for concern, given the region's already fragile health system. The insurgency in the region has disrupted access to basic services, including sanitation and hygiene facilities, further exacerbating the problem. The researchers noted that many schools in the region rely on donor-funded projects for the construction of toilet facilities, but these projects often lack sustainability plans, leading to the deterioration of facilities over time. This study seeks to address these gaps by examining the attitudes of boarding secondary school students in North East Nigeria towards toilet infection preventive measures.

Purpose of the Study

The purpose of this study was to assess the attitude towards toilet infection preventive measures among boarding secondary school students in North East, Nigeria.

Research Question

What is the attitude towards toilet infection preventive measures among boarding secondary school students in North East, Nigeria?

Hypothesis

Attitude towards toilet infection preventive measures among boarding secondary school students in North East, Nigeria is not significant.

Methodology

The study employed a descriptive survey research design to gather opinions on toilet infection preventive measures among female students in public boarding secondary schools in North-Eastern Nigeria. According to Aggarwal and Ranganathan (2019), this method allows researchers to obtain insights from a representative sample, facilitating inferences about the broader population. The target population comprised approximately 25,773 female students across various boarding schools in six states (Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe), as indicated by records from the State Ministries of Education (2023).

To determine the sample size, a total of 378 respondents was selected using a multi-stage sampling procedure. The process began with stratified sampling to categorize the Northeast Zone into its six states. From this pool, simple random sampling was used to select three states: Adamawa, Taraba, and Yobe. Each selected state was further divided into its senatorial zones, from which a purposive sampling method identified one zone with boarding schools. Subsequently, two Local Government Areas (LGAs) were chosen from each zone, followed by the selection of two female boarding schools per LGA, specifically targeting Senior Secondary II (SSII) students due to their maturity and familiarity with hygiene practices.

Data collection was facilitated through a researcher-developed questionnaire titled 'Assessment of Attitude toward Toilet Infection Preventive Measures among Boarding Secondary School Students (AATIPMBSSSQ).' This instrument, validated by experts, consisted of demographic questions and items assessing attitudes toward hygiene practices. A pilot study confirmed its reliability, achieving a Cronbach Alpha score of 0.851. Data collection occurred over eight weeks, with systematic sampling during school hours. Analysis was conducted using SPSS, employing descriptive statistics for demographic data and inferential statistics to test the hypothesis at a 0.05 significance level.

Results

All data collected on demographic characteristics of the respondents were tabulated using frequencies and percentages as indicated in Table 1

Table 1: Demographic Characteristics of the Respondents

Variables	Options	Frequency	Percentage (%)
Age Range in Years	13 – 15	63	16.7
	16 – 18	179	47.3
	19 – 21	77	20.4
	22 and above	59	15.6
	Total	**378**	**100.0**
Names of Schools	GSS, Mobi	50	13.2
	GSS, Michika	29	7.7
	GSS, Numan	32	8.5
	GGSS, Imburu	26	6.9
	GSS, Jalingo	33	8.7
	GSSSS, Nyabu Kata	25	6.6
	GGSSS, Wukari	25	6.6
	FGC, Wukari	34	9.0
	GSS, Damaturu	33	8.7
	GGC, Damaturu	30	7.9
	GSS, Potiskum	29	7.7
	GGSTC, Potiskum	32	8.5
	Total	**378**	**100.0**

Table 1 shows the demographic characteristics of the respondents. The table shows the age range and school distribution of the 378 respondents who participated in the study. Regarding age, the majority of the respondents 179 (47.3%) were in the 16-18 years age range, followed by 19-21 years 77 (20.4%), 13-15 years 63 (16.7%), and 22 years and above 59 (15.6%). This indicated that the sample was predominantly composed of late adolescent and young adult secondary school boarding students. In terms of the schools represented, the largest proportion of respondents 50 (13.2%) were from GSS, Mobi, followed by FGC, Wukari 34 (9.0%), GSS, Jalingo and GSS, Damaturu 33 (both 8.7%), GSS, Numan and GGSTC, Potiskum 32 (both 8.5%), GGC, Damaturu 30 (7.9%), GSS, Michika and GSS, Potiskum 29 (both 7.7%), GGSS, Imburu 26 (6.9%), and GSSSS, Nyabu Kata and GGSSS, Wukari 25 (both 6.6%). This diverse school representation allows for a more comprehensive understanding of the knowledge, attitudes, and practices related to toilet infection prevention among secondary school boarding students in the North East, Nigeria.

Research Question: What is the attitude towards toilet infection preventive measures among boarding secondary school students in North East, Nigeria?

Table 2: Mean Scores of Responses on Attitudes Towards Toilet Infection Preventive Measures among Boarding Secondary School Students in North East, Nigeria

S/N	Item	Mean	Std Dev
1.	I believe that handwashing with soap after using the toilet is essential for preventing infections	3.51	0.75
2.	I think it is important to clean the toilet seat before use to avoid infections	3.40	0.77
3.	I feel that using a toilet disinfectant is a necessary step to ensure hygiene.	3.21	0.71
4.	I think flushing the toilet with the lid closed is an important practice to prevent the spread of germs	3.09	0.76
5.	I believe that regular cleaning of the toilet bowl is crucial for preventing infections.	3.17	0.74
6.	I feel it is important to use separate cleaning tools for the toilet and other hostel areas.	3.29	0.72
7.	I am convinced that sharing towels used in the bathroom increases the risk of spreading infections	3.26	0.79
8.	I think that using toilet paper or wipes effectively is important for maintaining hygiene.	3.02	0.76
9.	I believe that disposing of sanitary products properly is vital for preventing infections.	3.18	0.74
10.	I feel that hand sanitizing after using public restrooms is a crucial preventive measure.	3.08	0.73
11.	I believe that avoiding direct contact with public restroom surfaces is important for reducing infection risks.	3.20	0.58
12.	I think that not touching my face after using the toilet until I wash my hands is an important hygiene practice.	3.03	0.64
13.	I feel that using a toilet seat cover or paper lining is necessary to prevent infections	3.04	0.72
14.	I think it is important to regularly clean and disinfect the flush handle or button.	2.87	0.78
15.	I believe that educating other students about proper toilet hygiene is important for infection prevention	3.23	0.72
	Aggregate Mean	**3.17**	

(Decision Mean – 2.50)

Table 2 presented the mean scores of responses on the attitudes towards toilet infection preventive measures among boarding secondary school students in North East, Nigeria. The decision mean was set at 2.50, which indicated that any mean score above 2.50 suggests a positive attitude among the respondents. The aggregate mean score across all 15 items is 3.17, which is above the decision mean of 2.50. This confirmed that the boarding secondary school students in the North East, Nigeria have a generally positive attitude towards toilet infection preventive measures. Specifically, the highest mean score is 3.51 for the

statement "I believe that handwashing with soap after using the toilet is essential for preventing infections." This indicated that the respondents have a strong positive attitude towards the importance of handwashing in preventing toilet-related infections.

Other items with high mean scores include "I think it is important to clean the toilet seat before use to avoid infections" (3.40), "I feel it is important to use separate cleaning tools for the toilet and other hostel areas" (3.29), and "I am convinced that sharing towels used in the bathroom increases the risk of spreading infections" (3.26). These results confirmed that the respondents have a positive attitude towards various preventive measures, such as cleaning the toilet seat, using dedicated cleaning tools, and avoiding sharing personal items. The items with relatively lower mean scores, but still above the decision mean, include "I think it is important to regularly clean and disinfect the flush handle or button" (2.87) and "I feel that using a toilet seat cover or paper lining is necessary to prevent infections" (3.04). This indicated that the respondents' attitudes towards these specific preventive measures, while still at an acceptable level, may need further improvement.

Hypothesis: Attitude towards toilet infection preventive measures among boarding secondary school students in North East, Nigeria is not significant.

Table 3: One-Sample t-test Analysis on Attitude towards Toilet Infection Preventive Measures among Boarding Secondary School Students in North East, Nigeria

Variable	N	Mean	Std. Dev.	df	t-value	p-value
Attitude	378	3.17	0.74	377	21.129	0.000
Test Mean	378	2.50	0.00			

Calculated p < 0.05, calculated t-value > 1.972 at df 377

The result of the one-sample t-test statistics in Table 3 revealed that the attitude towards toilet infection preventive measures among boarding secondary school students in North East, Nigeria is significant because the calculated p-value of 0.000 is less than the 0.05 level of significance and the calculated t-value of 21.129 is higher than the 1.972 critical t-value at 377 degrees of freedom (df). Therefore, the null hypothesis which stated that the attitude towards toilet infection preventive measures among boarding secondary school students in North East, Nigeria is not significant is hereby rejected. This means that boarding secondary school students in North East, Nigeria have a positive attitude towards toilet infection preventive measures.

Discussion of Finding

The study revealed that attitude toward toilet infection preventive measures among boarding secondary school students in North East, Nigeria is significant ($t = 21.129$; $p = 0.000$). This finding is in agreement with previous research that has examined students' attitudes regarding toilet infection preventive measures. Several studies, such as those by Muhammad and Lawal (2017), Aminu and Umaru (2018), and Ahmed and Mohammed (2020), indicate that students generally possess positive attitudes toward toilet hygiene and infection prevention. However, these studies also highlight a persistent gap in attitudes. For instance, Muhammad and Lawal (2017) found that while 80% of secondary school students in Adamawa State had good knowledge of toilet infection prevention measures, only 70% demonstrated positive attitudes toward them. Similarly, Aminu and Umaru (2018) revealed that although 75% of students in Bauchi exhibited strong knowledge and positive attitudes, only 55% adhered to proper toilet hygiene practices consistently. Furthermore, Ahmed and Mohammed (2020) reported that 80% of students in Northeast Nigeria were aware of infection preventive measures, yet only 60% consistently applied them in practice. These findings confirmed that while students recognize the importance of hygiene, translating positive attitudes into consistent behaviours remains a challenge.

On the other hand, studies such as those by Yusuf and Aminu (2020) and Musa and Dogo (2019) emphasize the role of facility availability and peer influence on students' hygiene practices. Yusuf and Aminu (2020) found that 60% of students in Yobe State practised adequate toilet hygiene, largely influenced by the availability of sanitary facilities and peer behaviours. Likewise, Musa and Dogo (2019) reported that 85% of secondary school students in Maiduguri acknowledged the significance of hygiene practices, yet proper implementation was inconsistent. These studies reinforce the argument that while students may express favourable attitudes toward infection prevention, practical adherence is often influenced by external factors such as infrastructure, school policies, and social dynamics.

Contrastingly, some studies indicate a weaker attitude toward hygiene practices. Sherpa et al. (2022) found that among adolescent girls in rural Sikkim, 63% exhibited unfavourable attitudes toward urinary tract infection (UTI) prevention despite 88% having moderate knowledge. Similarly, Bokolia (2016) reported that 65.79% of school-going adolescent girls had no knowledge of UTIs, and hygiene practices such as washing after urination were not widely observed. These findings differ from those in Northeast Nigeria, where students exhibit a more positive attitude, as suggested by the significant statistical result ($t = 21.129$; $p = 0.000$) in the present study. The significant attitude toward toilet infection preventive measures among boarding secondary school students in North East Nigeria is consistent with previous studies that emphasize high awareness and positive attitudes. However, the challenge remains in ensuring that these attitudes translate into consistent hygienic behaviours. Addressing this issue requires targeted health education interventions, facility improvements, and reinforcement through school policies to ensure that positive attitudes lead to sustained hygiene practices.

Conclusions

Based on the findings of the study, the study concluded that boarding secondary school students in North East, Nigeria have positive attitudes towards toilet infection preventive measures.

Recommendations

Based on the conclusions, the study recommended that school counsellors should continue to foster a positive attitude towards toilet infection preventive measures among boarding secondary school students in North East, Nigeria through targeted behavioural interventions.

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