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

[*]Hannatu Solomon AKUNDO and Janet AKYOBA

Department of Human Kinetics and Health Education, Taraba State University, Jalingo, Nigeria
[*]Corresponding Author: Solomonhannatu88@gmail.com; 07035579772

Abstract

The study assessed the practice of 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 coefficient value was obtained. The Descriptive statistics of frequency and simple percentages were used to analyze the demographic characteristics of the respondents. The research question was answered using mean and standard deviation and 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 practice of toilet infection preventive measures is significant ($t = 15.351$; $p = 0.000$). Based on the results, the study concluded that boarding secondary school students in North East, Nigeria practice 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: Practice, 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. According to the World Health Organization (WHO, 2022), over 1.7 billion people worldwide lack access to basic sanitation services, contributing to the prevalence of toilet-related infections. In low- and middle-income countries, the burden of these infections is disproportionately high, with women and adolescents being the most affected due to biological and social factors. The global prevalence of UTIs, a common toilet infection, is estimated at 150 million cases annually, with significant morbidity and economic costs (Foxman, 2021).

In Africa, the situation is particularly dire due to widespread poverty, inadequate infrastructure, and limited access to clean water and sanitation facilities. According to UNICEF (2021), approximately 60% of the population in sub-Saharan Africa lacks access to safely managed sanitation services. This has led to a high prevalence of toilet infections, with studies reporting that up to 50% of women in some African countries experience at least one episode of UTI in their lifetime (Harande et al., 2025; Okonko et al., 2020; Solomon et al., 2025). In Nigeria, the problem is exacerbated by overcrowded living conditions, poor maintenance of sanitation facilities, and limited health education (Abdulbaqi et al., 2019). A study conducted in Southeast Nigeria revealed that 35% of secondary school students reported symptoms of toilet infections, with poor hygiene practices identified as a major contributing factor (Nwadiuto & Okonko, 2018).

In Nigeria, the issue of toilet infections is a pressing public health challenge (Amin et al., 2024), particularly in boarding secondary schools where students live nearby and share sanitation facilities. According to the Nigerian Ministry of Health (2020), over 70% of public schools in the country lack adequate toilet facilities, and many existing facilities are poorly maintained. This has led to a high prevalence of toilet infections among students, with studies reporting that up to 40% of female students in boarding schools have experienced at least one episode of UTI (Adebayo et al., 2019). The situation is particularly severe in the North-East region of Nigeria, where

conflict and displacement have further strained already limited resources. A recent survey conducted in Borno State found that 60% of boarding school students reported using unsanitary toilets, and 45% had experienced symptoms of toilet infections within the past year (Aliyu et al., 2021).

Preventive measures for toilet infections include proper handwashing, regular cleaning of toilet facilities, use of clean water, and education on personal hygiene. The WHO (2022) emphasizes the importance of handwashing with soap and water as one of the most effective ways to prevent the spread of infections. Additionally, maintaining clean and functional toilet facilities is critical to reducing the risk of contamination. In boarding schools, where students share facilities, regular cleaning and disinfection of toilets are essential to prevent the spread of pathogens.

Despite the availability of preventive measures, the practice of toilet infection prevention remains suboptimal in many settings, particularly in low-resource environments. Studies have shown that many students lack knowledge of proper toilet hygiene practices, and even when they are aware, they often fail to adhere to them due to inadequate facilities or lack of motivation (Oloruntoba & Folarin, 2020). In Nigeria, for example, a study conducted in Lagos State found that only 30% of secondary school students practised regular handwashing after using the toilet, and 50% reported using unclean toilet facilities (Akinwale & Ogunnowo, 2017).

Previous studies have examined the practice of toilet infection preventive measures among various populations, including secondary school students. A study conducted in Kenya found that students who received hygiene education were more likely to practice proper handwashing and maintain clean toilet facilities (Mbugua & Kariuki, 2016). Similarly, a study in Ghana revealed that the provision of clean water and soap in schools significantly improved students' hygiene practices and reduced the incidence of toilet infections (Adjei & Oduro-Kwarteng, 2018). However, there is limited research on the practice of toilet infection preventive measures among boarding secondary school students in North-East Nigeria, despite the high prevalence of infections in this region. Poor sanitation facilities, lack of clean water, and inadequate health education contribute to the high prevalence of infections in this population. Despite the availability of preventive measures, many students fail to practice proper toilet hygiene due to a lack of awareness, resources, or motivation. This study seeks to address this gap by examining the practice of toilet infection preventive measures among boarding secondary school students in North-East Nigeria.

Purpose of the Study

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

Research Question

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

Hypothesis

The practice of 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 assess the practice of toilet infection preventive measures among female students in public boarding secondary schools in North-Eastern Nigeria. According to Aorede et al. (2022), this design allows researchers to gather opinions from a representative sample to infer the perceptions of the entire population. The target population comprised 25,773 female students across six states (Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe), as recorded by the State Ministries of Education (2023). A multi-stage sampling procedure was used to select 378 respondents, ensuring adequate representation with a 95% confidence level and a 5% margin of error. The sampling process involved stratified, simple random, purposive, and systematic techniques, culminating in the selection of 12 schools and SS II students, who were deemed mature and experienced enough to provide reliable insights into hygiene practices.

Data collection was carried out using a researcher-developed questionnaire titled Assessment of Practice of Toilet Infection Preventive Measures among Boarding Secondary School Students (APTIPMBSSSQ). The instrument, divided into demographic and practice sections, utilized a 4-point Likert scale. Its validity was confirmed by five experts from Ahmadu Bello University, Zaria, while reliability was established through a pilot test involving 30 respondents in Benue State, yielding a Cronbach Alpha coefficient of 0.851. The questionnaire was administered systematically during school hours and retrieved immediately to prevent loss. Data collection spanned eight weeks, with permissions secured from relevant educational authorities.

Data analysis was conducted using the Statistical Package for Social Sciences (SPSS). Descriptive statistics, including frequencies and percentages, were used to analyze demographic characteristics, while means and standard deviations addressed the research question. Inferential statistics, specifically a one-sample t-test, were employed 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 4.1

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 practice of toilet infection preventive measures among boarding secondary school students in North East, Nigeria?

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

S/N	Item	Mean	Std Dev
1.	I consistently wash my hands with soap and water immediately after using the toilet to prevent infections	3.21	0.72
2.	Before using a public or shared toilet, I always clean the toilet seat to ensure it is hygienic and to prevent infections	3.17	0.73
3.	I make it a habit to use toilet disinfectant sprays or wipes to sanitize the toilet seat and surrounding areas before use	2.54	0.70
4.	I always flush the toilet with the lid closed to minimize the spread of germs and maintain a hygienic environment	2.73	0.78
5.	I regularly clean the toilet bowl in my hostel using appropriate cleaning agents to prevent the build-up of bacteria and infections.	2.79	0.73
6.	I ensure that separate cleaning tools are used for the toilet and other parts of the hostel to avoid cross-contamination and infection.	3.07	0.72
7.	I avoid sharing towels with others in the bathroom to reduce the risk of spreading infections.	3.25	0.68
8.	I always use toilet paper or wipes properly and dispose of them correctly to maintain toilet hygiene and prevent infections	2.94	0.78
9.	I make sure to dispose of sanitary products hygienically to prevent infection and maintain cleanliness.	3.11	0.74
10.	After using public restrooms, I regularly use hand sanitiser to ensure my hands are free from germs and potential infections.	3.01	0.81
11.	I am cautious to avoid direct contact with surfaces in public restrooms, such as door handles and faucets, to reduce infection risks.	3.15	0.63
12.	I refrain from touching my face after using the toilet until I have washed my hands thoroughly to prevent infections.	3.13	0.74
13.	When available, I use toilet seat covers or line the toilet seat with paper to prevent direct contact and reduce the risk of infection.	2.84	0.75
14.	I make it a point to clean and disinfect the flush handle or button regularly to ensure it is free from germs and bacteria	2.67	0.73
15.	I actively educate and remind others in my school about proper toilet hygiene practices to help prevent infections.	3.19	0.71
	Aggregate	**2.99**	

(Decision Mean – 2.50)

Table 2 presented the mean scores of responses on the practice of toilet infection preventive measures among boarding secondary school students in the North East, Nigeria. The decision mean was set at 2.50, which indicated that any mean score above 2.50 suggests a positive practice among the respondents. The aggregate mean score across all 15 items is 2.99, which is above the decision mean of 2.50. This affirmed that the boarding secondary school students in the North East, Nigeria generally practice toilet infection preventive measures. Specifically, the highest mean score is 3.25 for the statement "I avoid sharing towels with others in the bathroom to reduce the risk of spreading infections." This indicated that the respondents consistently practice this preventive measure to avoid the spread of infections.

Other items with high mean scores include "I make sure to dispose of sanitary products hygienically to prevent infection and maintain cleanliness" (3.11), "I am cautious to avoid direct contact with surfaces in public restrooms, such as door handles and faucets, to reduce infection risks" (3.15), and "I refrain from touching my face after using the toilet until I have washed my hands thoroughly to prevent infections" (3.13). These results suggest that the respondents consistently practice these preventive measures to maintain toilet hygiene and prevent the spread of infections. The items with relatively lower mean scores, but still above the decision mean, include "I make it a habit to use toilet disinfectant sprays or wipes to sanitize the toilet seat and surrounding areas before use" (2.54), "I always flush the toilet with the lid closed to minimize the spread of germs and maintain a hygienic environment" (2.73), and "I make it a point to clean and disinfect the flush handle or button regularly to ensure it is free from

germs and bacteria" (2.67). These results suggest that the respondents may need to improve their consistent practice of these specific preventive measures.

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

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

Variable	N	Mean	Std. Dev.	df	t-value	p-value
Practice	378	2.99	0.75	377	15.351	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 practice of 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 15.351 is higher than the 1.972 critical t-value at 377 degrees of freedom (df). Therefore, the null hypothesis which stated that the practice of 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 practice toilet infection preventive measures.

Discussion of Finding

The study revealed that the practice of toilet infection preventive measures among boarding secondary school students in North East, Nigeria is significant ($t = 15.351$; $p = 0.000$). The finding aligns with several previous studies that emphasize the importance of hygiene awareness and practice among students. For instance, Ahmed and Mohammed (2020) found that while 80% of students were aware of infection preventive measures, only 60% consistently practised them, indicating a gap between knowledge and action. Similarly, Aminu and Umaru (2018) reported that 75% of students in Bauchi demonstrated good knowledge and positive attitudes toward toilet hygiene, yet only 55% consistently implemented hygiene practices. The current study's significant finding suggests that efforts to promote hygiene practices in boarding schools have yielded tangible results, possibly due to increased awareness campaigns, improved sanitation facilities, or school policies enforcing proper hygiene.

In contrast, other studies indicate that despite awareness, hygiene practices remain inconsistent. Sani and Bello (2019) found that although 65% of secondary school students in Gombe State had good knowledge of hygiene practices, only 45% adhered to effective toilet hygiene. Likewise, Musa and Dogo (2019) highlighted a disparity between attitude and action, with 85% of students acknowledging the importance of hygiene practices but failing to maintain them consistently. These findings suggest that while knowledge and attitude are crucial, structural and behavioural reinforcements are necessary to ensure that students translate their awareness into consistent hygienic practices.

The study's results also resonate with global research on hygiene behaviours. For example, Sherpa et al. (2022) found that while 88% of adolescent girls in rural Sikkim had moderate knowledge of urinary tract infection prevention, 63% had unfavourable attitudes, which could impact their actual practices. Similarly, Almaghlouth et al. (2023) identified misconceptions about UTI risk factors among Saudi Arabian citizens, indicating that awareness does not always equate to correct practices. However, the current study's statistical significance ($p = 0.000$) suggests that boarding school students in North East Nigeria may have benefited from targeted interventions, structured hygiene education, and access to better sanitation facilities, leading to a more robust practice of preventive measures.

Conclusions

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

Recommendations

Based on the conclusions, the study recommended that the school health services should closely monitor and provide support to ensure boarding secondary school students in North East, Nigeria consistently practice toilet infection preventive measures.

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