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Original Research Article

Sanitation practices and health outcomes among undergraduates in a tertiary institution: a cross-sectional study in the middle belt

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ABSTRACT

Background: Globally, inadequate sanitation behaviours have accounted for numerous health risks. World Health Organization (WHO) reports that poor sanitation contributes to spread of diseases such as diarrhoea, cholera, and typhoid, which are responsible for a significant burden of morbidity and mortality, particularly in low- and middle-income countries in the world.
Methods: A cross-sectional descriptive study was carried at Benue State University, Makurdi, Nigeria, with a multistage sampling technique. Data was collected and analysed using SPSS (version 20.0).
Results: We observed insufficient handwashing facilities at strategic locations on campus (86.6), with inadequate awareness and education on sanitation behaviours, accounting for the improper sanitation among the students. Also, inadequate sanitary facilities such as insufficient number of clean and well-maintained restrooms (52.7%), poor waste management system as a result of insufficient waste collection and disposal services on campus (46.0%) as a result of lack of strict enforcement of sanitation rules and policies (41.8%) all were major contributing factors.
Conclusions: Accommodation and sanitation facilities in halls and hostels were found to be inadequate. Some reasons for the poor state of some of the facilities found in our study includes absent sanitation rules and policies on campus, lack of awareness campaigns or programs on campus to promote better sanitation behaviours, among others; were found to contribute significantly to the poor state of sanitation on campus.

Keywords: Health outcomes, Sanitation behaviours, Undergraduates

INTRODUCTION

Globally, inadequate sanitation practices have been associated with numerous health risks. The World Health Organization (WHO) reports that poor sanitation contributes to the spread of diseases such as diarrhoea, cholera, and typhoid, which are responsible for a significant burden of morbidity and mortality, particularly in low- and middle-income countries.[1]

Throughout the world, WHO and United Nations Children's Fund (UNICEF) estimated that 2.5 billion people lack basic sanitation (more than 35% of the world's population).[2] Basic sanitation is described as having access to facilities for safe disposal of human waste (faeces and urine), as well as having the ability to maintain hygienic conditions, through services such as garbage collection, industrial/hazardous waste management, and wastewater treatment and disposal with immediate acceleration in progress, the world will not achieve the United Nations' Millennium Development

Goal (MDG) sanitation target (i.e., to halve the proportion of people without sustainable access to basic sanitation by 2015).[2]

School sanitation refers to hygienic practices that occur in schools. School Sanitation and Hygiene education are a combination of hardware and software components that are necessary to produce a healthy school environment to develop or support safe hygienic behaviour.[3] These hardware components of school sanitation encompass the provision of drinking water, hand-washing facilities, and proper disposal systems for excreta and solid waste within and around the school premises. While the software components refer to activities and practices that promote hygiene, such as the behaviours of school staff and students that prevent water and sanitation-related illnesses and parasites.[3]

Learning in an unhygienic environment affect learning in a lot of ways. Studies show that health influences learning and education influences health which is indicated in the fact that poor sanitation causes diarrhoea which keeps students in hospitals rather than in schools and also noted that diarrhoea kills 1.5 million children each year.[4] Poor sanitation also leads to waterborne diseases (like typhoid, cholera), infections with intestinal worms, stunted growth and malnutrition.[5]

National Environmental Standard and Regulation Agency (NESREA) in Nigeria plays a crucial role in sanitation and emphasize the need for proper sanitation practices in all sectors, including tertiary education institutions. However, the implementation of sanitation practices in tertiary institutions has varied across the country. Some institutions have implemented comprehensive sanitation programs, while others face challenges in maintaining adequate sanitation facilities and promoting hygiene practices among students.[6]

A study conducted to identify sanitation practices among undergraduate students in the halls of residents in University of Benin revealed that: Sanitation practices among undergraduate students in the University of Benin are low, with age and gender influencing sanitation practices. And also, inadequate water supply, poor toilet facilities, insufficient toilet, bathroom and waste disposal facilities and poor drainage system are the major causes of poor sanitation in the hostel environment.[7] Therefore, there is need to conduct this study that specifically examines the sanitation behaviours at Benue State University, Makurdi, Nigeria, and evaluates their effects on students' health.

METHODS

Study design and population

A cross-sectional study was used to collect data from selected campuses. The Population of students of the university from both First and Second Campuses and College of Health Sciences Hostels of the university from January to December 2023.

Study area

The study was conducted in Benue State University Makurdi located along Km1 Gboko Road near the Southern bridgehead of the Benue River on sandy alluvial formation. It occupies 6 square kilometer piece of land between Gboko Road and River Benue approximately 1.5km wide and 4km long. It is bounded to the West by the Benue Links Headquarters and to the East by Benue State University Teaching, Hospital, Makurdi.

Inclusion criteria

All consenting undergraduate student of the university.

Exclusion criteria

All non-consenting students and students staying off campus of Benue State University Makurdi from various departments and levels of interest.

Sample size determination

The minimum sample size was determined using Fisher's formula:[8]

$$n = \frac{Z^2 pq}{d^2}$$

Where;

n = The minimum sample size; z = The standard normal deviation, set at 1.96 (95%) confidence interval; p = The proportion of the target population estimated to have knowledge about sanitation practices previous study = 0.83.

q = 1-P

d = Degree of accuracy desired = 0.05

$$n = \frac{(1.96)^2 \ X \ 0.83 \ X \ 0.17}{(0.05)^2}$$

n = 216.7

To correct for non-response at 10%

$$n^1 = \frac{n}{1-f}$$

Where;

n^1= Sample size after non-response rate at 10% has been corrected, n = minimum sample size, f=Assured non-response.

$$n = \frac{218}{0.87}$$

$n^1 \approx 250$

Sampling technique

A multi stage random sampling technique was used.

Stage one: Selection of university by convenience sampling.

Stage two: Selection of campus in Benue state university was by simple random sampling via balloting sampling technique.

Stage three: Selection of hostel was done by simple random sampling via balloting.

Stage four: Selection of respondents by systematic sampling technique.

Instrument for data collection

A self-administered questionnaire was designed to elicit feedback according to the research aim and objectives. Data collected from the self-administered questionnaire contained the following sections; socio-demographic profile, poor sanitation practices, causes of poor sanitation, effects on poor sanitation practises.

Data collection

In order to successfully answer the research questions guiding the study, we selected one campus of the university for a pre-test. Research assistance was trained for two days on the procedure for administering the research instrument from respondents.

Data analysis

The data for the research was subjected to statistical analysis of frequency and percentages (%) via Statistical Package for Social Science (SPSS 20) in order to answer the research questions.

RESULTS

Below are all the data collected through a field survey and subsequent analysis. Out of the 250 questionnaires distributed, 239 were returned.

Table 1: Socio-demographic characteristics.

Variable	Frequency (n=239)	Percentage (%)
Age in years		
11-20	21	8.8
21-30	213	89.2
31-40	4	1.6
41 - above	1	0.4
Sex		
Male	110	46.0
Female	129	54.0

Table 2: Poor sanitation practices.

Sanitation practices	Frequency (n=239)	Percentage (%)
Dustbins found in the hostel		
1	13	5.4
2	24	10.0
> 2	201	84.1
Cleaners per hostel		
1	32	13.4
2	39	16.3
> 2	168	70.3
Improper waste disposal on campus		
Frequently	116	48.5
Occasionally	97	40.6
Rarely	24	10.0
Never	2	0.8
Trash bins and recycling facilities available on campus		
Yes, accessible	130	54.4
Yes, not easily accessible	92	38.5
No	17	7.1

Continued.

Sanitation practices	Frequency (n=239)	Percentage (%)
Rate the cleanliness of common areas, such as classrooms, libraries, and corridors		
Very Poor, frequently dirty and unkempt	11	4.6
Poor	24	10.0
Average	145	60.7
Good	54	22.6
Excellent	5	2.1
Notice overflowing or poorly maintained restroom facilities on campus		
Yes, frequently	148	61.9
Yes, occasionally	76	31.8
No, they are usually well-maintained	15	6.3
Rate the general sanitation of dining areas and food service outlets		
Very poor	12	5.0
Poor	66	27.6
Good	159	66.5
Excellent	2	.8
Sufficient handwashing facilities available at strategic locations on campus		
Yes, abundant and well-distributed	5	2.1
Yes, not adequately distributed	27	11.3
No	207	86.6
Open defecation or improper disposal of human waste on campus		
Yes, frequently	21	8.8
Yes, occasionally	95	39.7
No	123	51.5
Awareness campaigns or programs on campus		
Yes, frequent awareness campaigns	14	5.9
Yes, infrequent	83	34.7
No	142	59.4

Table 3: Causes of poor sanitation practices.

Causes of poor sanitation	Frequency (n=239)	Percentage (%)
Inadequate awareness and education		
Lack of proper sanitation education and awareness programs	113	47.3
Insufficient information on waste segregation and disposal	45	18.8
Limited understanding of the consequences of poor sanitation practices	81	33.9
Inadequate sanitary facilities		
Insufficient number of clean and well-maintained restrooms	126	52.7
Inadequate waste disposal facilities in public areas and classrooms	76	31.8
Lack of access to clean and hygienic water sources	37	15.5
Poor waste management system		
Inefficient waste collection and disposal services on campus	110	46.0
Absence of designated waste bins for different types of waste	72	30.1
Inadequate waste management infrastructure	57	23.8
Cultural and behavioural factors		
Lack of concern or responsibility for maintaining cleanliness	154	64.4
Cultural practices that do not prioritize sanitation	32	13.4
Disregard for proper waste disposal due to peer influence	53	22.2
Inadequate enforcement of sanitation regulations		
Lack of strict enforcement of sanitation rules and policies	100	41.8
Absence of penalties or consequences for poor sanitation practices	77	32.2
Inconsistent monitoring and inspection of sanitation practices	62	25.9
Infrastructure and maintenance issues		
Poorly maintained drainage systems leading to waterlogging	114	47.7
Insufficient cleaning and maintenance of public spaces	61	25.5

Continued.

Causes of poor sanitation	Frequency (n=239)	Percentage (%)
Inadequate garbage collection and disposal infrastructure	64	26.8

DISCUSSION

The findings in this study gave a realistic depiction of the sanitation status of school hostels as they truly appear. It showed that majority of the students utilized the available and functional sanitary facilities (waste bin, toilet, water, hand washing facility) provided in school hostels as sanitation remained the basic of health issue in every society. Sanitation remained the most basic of health issues in every society and school management still have a lot to do in terms of water supply and sanitary maintenance.

Findings from table one on socio-demographic characteristics revealed that most of the respondents fall within the mean age of 24 years and were comprise of mostly female students (54.0%) within age bracket of 21-30 years (87.86%). This study is consistent with the research carried out in Ghana where most or majority of the respondents where female students of secondary school age 16-21 years who keep clean their environment and body generally neat compare to the male students.[9] Contrary, this disagrees with research carried out in University of Benin Undergraduate Students, Nigeria where it showed that gender and age influences sanitation practices of students. It was discovered that male students engage more in sanitation practices than female students and also, those between the ages of 18-25 years engage more in sanitary practices because at that very stage in life, individuals do their best to fit into the society to be accepted by their peers.[10]

Findings from table two indicate the ways in which poor sanitation practices can be improved and it showed that majority of the respondents had more than 2 dustbins in their hostels (84.1%), and two cleaners per hostels (70.3%) and as such frequent observation of improper waste disposal on campus (48.5%) was discouraged as trash bins and recycling facilities were accessible (54.4%) which greatly prevent open defecation or improper disposal of human waste on campus (51.5%). Although more campaign awareness or programmes on campus is needed (59.4%). This study is supported by WHO and UNICEF when they stated that sanitation involves having access to facilities for the safe disposal of human waste (faeces and urine), as well as having the ability to maintain hygienic conditions, through services such as garbage collection, industrial/hazardous waste management, and wastewater treatment and disposal.[11] This study disagrees with Ikelegbe when he revealed inadequate staff strength which projected at least four cleaners around student's environment as less than such will bring about lack of sanitation, unsafe disposal or storage of waste in/around the environ, and in undesignated containers which may provide habitats for vectors of diseases that cause various infectious diseases including typhoid fever and diarrhoeas.[12]

Findings of table three on causes of poor sanitation practices showed that majority of the respondents had inadequate awareness and education on sanitation practices as it largely contributes to lack of proper sanitation (47.3%) among the students thereby bringing inadequate sanitary facilities brought about by insufficient number of clean and well-maintained restrooms (52.7%), inefficient waste collection and disposal services on campus (46.0%) as a result of lack of strict enforcement of sanitation rules and policies (41.8%). The study agrees with a study done in western Cameroun where it indicate the ways in which sanitation practices can be improved include; need for environmental sanitation research, the need for students to undertake hygiene education, more health workers should be trained to include sanitation practises counselling into their consultations with patients, more toilets should be put in place in strategic locations to complement the existing ones to reduce incessant urination and faecal deposit, impromptu inspection around the campus from time to time.[13]

Findings from Table 2 shows the effects of poor sanitation which shows that occasionally (38.9%) experience instances of poor sanitation practices on the university campus with restrooms and washroom been the most common areas on the campus that is mostly affected by poor sanitation practices (36.8%), majority of the respondents rate the cleanliness and maintenance of restroom facilities very poor (40.2%) as frequently witnessed improper disposal of waste materials or littering around the campus (46.9%) which generally affect the overall academic performance and learning of students (56.9%) thereby bringing about illness such as diarrhoea, typhoid, cholera infection, etc. The findings are supported by WHO when it estimated that 88% of diarrhoeal disease is caused by unsafe water supply and inadequate sanitation and hygiene.[14] Also, Snel and Water Aid Uganda backed up the findings when their study discovered that diarrhoea which is caused by poor sanitation kills 1.5 million children each year.[15,16]

CONCLUSION

Accommodation and sanitation facilities in halls and hostels is found to be inadequate despite some expansions in toilets. Probable reasons for the poor state of some of the sanitary facilities found in the study included inadequate handwashing facilities, lack of awareness campaigns or programs on campus to promote better sanitation practices among others to contribute significantly to the state of sanitary practice on campus.

Recommendations

Based on the findings of this study; 1) Student's hand books should contain information on how to properly use sanitary facilities on campus and how to maintain them, 2) There should be regular sanitation awareness campaigns and educational sessions organized by the environmental health section of the University Health Services that will address health issues associated with poor sanitation, 3) Compulsory general studies courses should be taught concerning sanitation practices and health, 4) In order to improve students' attitude, authorities must ensure that all regulations on sanitation are enforced. Punitive actions should be taken against students who flout such regulations so as to install in them self-discipline and sanitation consciousness.

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