



PREVALENCE, CAUSES AND CONSEQUENCES OF OPEN DEFECATION AMONG STUDENTS OF NNAMDI AZIKIWE UNIVERSITY, AWKA, ANAMBRA STATE, NIGERIA

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ABSTRACT

This work investigated the prevalence, causes, and consequences of open defecation among students of Nnamdi Azikiwe University, Awka, Anambra State, Nigeria. This study was embarked upon to investigate the various factors influencing the persistence of open defecation on campus. The study adopted the survey research design, using the multistage sampling procedure in the selection of 204 respondents. The target population were undergraduate students of Nnamdi Azikiwe University, Awka. A questionnaire schedule served as the instrument for data collection. The collected data were coded and processed using the Statistical Package for the Social Sciences (SPSS) version 25. Frequency tables and charts were used to analyze, describe and present the data. The study found that open defecation is prevalent among students of Nnamdi Azikiwe University, Awka. Insufficient toilet facilities, poor maintenance, and lack of water supply were identified as the major factors influencing open defecation. Based on the findings of the study, the work recommended that to curb open defecation, it is crucial to provide adequate, well-maintained, and gender-sensitive toilets across campus. The study also recommended sustained hygiene education to promote behavioural change.

Keywords: hygiene practices, open defecation, public health, sanitation facilities, toilet.

INTRODUCTION

Open defecation has been a serious health concern in developing countries for a very long time. It is the practice of defecating in open places like fields, bushes, drainages or streets, rather than using a toilet. It is a public health concern and is particularly problematic in places with inadequate toilet and sanitation facilities. The United Nations (2023) estimated that approximately 419 million people worldwide practiced open defecation as of 2022, a significant decrease from previous years but still a pressing public health issue. West and Central Africa account for 14% of global open defecation with eight countries in these regions having more than 5 million open defecators, including Nigeria which ranks second in the world with over 47 million. In addition, in 12 of the regions' 24 countries, more than 20% of the population practices open defecation (United Nations Children's Fund, 2017).



There are numerous factors that explain why open defecation is still practiced in many parts of Nigeria. Inadequate access to proper sanitation facilities is a significant problem as 25% of Nigerians continue to reside without a basic toilet, particularly in rural regions where poverty restricts the capability of families to build or sustain toilets and in which proper sanitation technology might not be accessible (Abubakar, 2018; Atangana & Oberholster, 2023; Jimmy et al., 2026). Lack of adequate toilets in urban areas causes people to defecate in the open, and the lack of adequate upkeep of the available toilets makes them unusable in most cases, especially in public institutions like schools and universities (Wada et al, 2022; Adjibolosoo et al, 2020; Alemu et al, 2024). To worsen this issue, there is no quality access to clean water, which compromises the functionality of sanitation systems; in cases of toilet availability, unreliable water access renders them unuseable or poorly maintained, and people find it easier to use the so-called convenience of open defecation (Belay et al, 2022; Ismail et al, 2024). Moreover, systemic problems in governance, such as low political priority of sanitation and low funding, ineffective policy implementation, and absence of accountability, are barriers to long-term improvement and the scope of sanitation efforts intended to encourage hygiene and toilet use (Adugna, 2023; Abubakar, 2018).

Open defecation has severe consequences that adversely affect public health, environmental sustainability, and social dignity. The practice contributes significantly to the spread of infectious diseases, particularly in areas with inadequate sanitation infrastructure, as human waste contaminates water sources and the surrounding environment. This contamination leads to high rates of gastrointestinal diseases, cholera, and other waterborne illnesses, disproportionately affecting vulnerable populations such as children under five years old, who are at a higher risk of mortality due to these preventable diseases (Okullo et al, 2017). Furthermore, the practice perpetuates a cycle of poverty as communities where open defecation is high usually experience poor nutrition and health outcomes, which not only hinders economic development, but worsen inequalities between rich and poor (Ismail et al, 2024). The lack of privacy associated with open defecation also poses significant risks for women and girls, increasing their vulnerability to sexual exploitation and compromising their dignity (Saleem et al, 2019; Caruso et al., 2022; Khare & Suresh, 2024).

While literature and studies abound about the practice of open defecation in communities, there is a noticeable dearth of studies about how this problem affects institutions of learning. This study is an attempt to bridge that gap in literature. Open defecation is a major problem in Nnamdi Azikiwe University, Awka as the lack of toilet facilities and the poor maintenance of the existing ones have led to students and even staff resorting to defecating in bushes. This practice has serious health implications. It is against this backdrop that this work investigated the prevalence, causes and consequences of open defecation among students of Nnamdi Azikiwe University, Awka, Anambra State.

RESEARCH QUESTIONS

The following research questions guided this study:

1. How prevalent is open defecation among students of Nnamdi Azikiwe University, Awka?
2. What are the causes of open defecation among students of Nnamdi Azikiwe University, Awka?
3. What are the consequences of open defecation among students of Nnamdi Azikiwe University, Awka?
4. What measures can be put in place to curb open defecation among students of Nnamdi Azikiwe University, Awka?



OBJECTIVES OF THE STUDY

This work has both general and specific objectives. The general objective of this work is to investigate the prevalence, causes and consequences of open defecation among students of Nnamdi Azikiwe University, Awka, Anambra State. The specific objectives of this study are as follows:

1. To assess the prevalence of open defecation among students of Nnamdi Azikiwe University, Awka.
2. To investigate the causes of open defecation among students of Nnamdi Azikiwe University, Awka.
3. To find out the consequences of open defecation among students of Nnamdi Azikiwe University, Awka.
4. To recommend measures that can be put in place to curb open defecation among students of Nnamdi Azikiwe University, Awka.

MATERIALS AND METHODS

The research employed survey research design and was carried out in the main campus of the university in Awka. A sample size of 204 students was calculated with the Taro Yamane formula. The respondents were selected through a multi-stage sampling method where random selection of 27 departments out of nine faculties and availability sampling of at least eight students in each department were employed. A researcher-constructed questionnaire was distributed to the selected respondents to collect data. The respondents were assured of their anonymity and they gave their informed consent. The collected data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25 software and was presented using tables and charts.

RESULTS/FINDINGS

In this study, 204 questionnaires were administered by the researcher, out of which 200 (98%) of the questionnaires were correctly filled and returned. The analysis is consequently based on the correctly filled and returned 200 questionnaires.

Socio-demographic Data of Respondents

This sub-section deals with the socio-demographic data of respondents.

Table 1: Distribution of respondents by their socio-demographic characteristics

Responses	Frequency	Percent
SEX		
Male	62	31
Female	138	69
Total	200	100
LEVEL		
100	31	15.5
200	30	15
300	26	13
400	107	53.5
500	6	3
Total	200	100
AGE		
16-20	80	40
21-25	113	56.5
26-30	7	3.5
Total	200	100



RELIGIOUS AFFILIATION

African Traditional Religion	6	3
Christianity	189	94.5
Islam	2	1
Atheism	1	0.5
Others	2	1
Total	200	100

RESIDENCE

On campus	28	14
Off campus	172	86
Total	200	100

Field Survey, 2025

The socio-demographic distribution of respondents reveals the following: A majority of the respondents are female (69%), suggesting gendered perspectives may dominate the findings, while males constitute only 31%. In terms of academic level, most respondents are in their 400 level (53.5%), indicating that more experienced students participated, whereas 100 level (15.5%), 200 level (15%), and 300 level (13%) students are moderately represented, and only a few are in 500 level (3%). Age-wise, most respondents fall within the 21–25 years bracket (56.5%), which is typical for undergraduates, followed by 16–20 years (40%) and a small group aged 26–30 (3.5%), showing a youthful academic population. Religious affiliation is heavily skewed toward Christianity (94.5%), with minimal representation from African Traditional Religion (3%), Islam (1%), atheism (0.5%), and others (1%), indicating limited religious diversity. Finally, only 14% of respondents reside on campus, while a significant 86% live off campus.

Analysis of Research Questions

This sub-section dealt with the analysis of data and interpretation of findings with regards to the research questions and specific objectives of the study.

Research Question 1: How prevalent is open defecation among students of Nnamdi Azikiwe University, Awka? The findings are presented below:

Table 2: Respondents' views on the prevalence of open defecation among students

Responses	Frequency	Percent
Highly prevalent	65	32.5
Prevalent	58	29.0
Neutral	49	24.5
Not prevalent	28	14.0
Total	200	100.0

Field Survey, 2025

The data reveals that a significant portion of respondents perceive open defecation as a common issue among students. Specifically, 32.5% believe it is highly prevalent, while another 29% consider it prevalent, amounting to a combined 61.5% who acknowledge its widespread occurrence. Meanwhile, 24.5% hold a neutral view, possibly indicating uncertainty or limited personal experience with the issue. Only 14% believe open defecation is not prevalent, suggesting that a small minority perceive it as a non-issue. These findings imply that the majority of students are either directly aware of or exposed to open defecation practices.

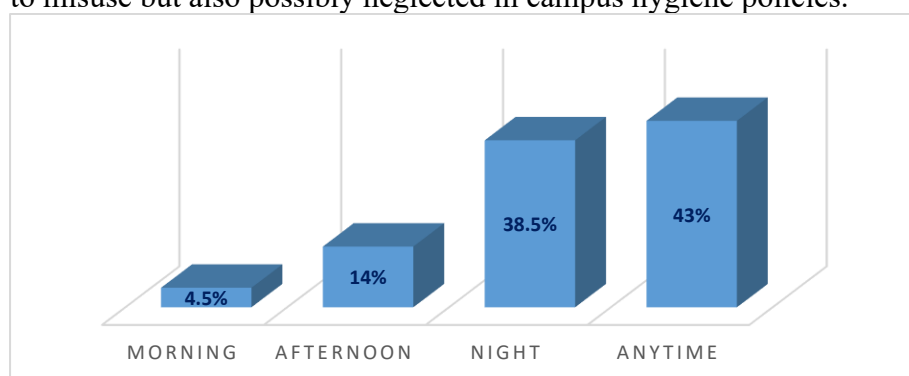


Table 3: Respondents' views on where students usually practice open defecation on campus

Responses	Frequency	Percent
Bushy areas	155	77.5
Behind lecture halls	19	9.5
Near hostels	13	6.5
Other	13	6.5
Total	200	100.0

Field Survey, 2025

Table 3 shows that bushy areas are the most common locations where students reportedly practice open defecation on campus, as indicated by 77.5% of the respondents. This suggests that such areas, likely due to their privacy and concealment, are easily accessible and frequently used for this purpose. A smaller proportion of respondents (9.5%) identified behind lecture halls as defecation sites, while 6.5% pointed to areas near hostels, and another 6.5% mentioned other unspecified locations. The overwhelming use of bushy areas highlights a serious sanitation and environmental health concern, indicating that these spots are not only vulnerable to misuse but also possibly neglected in campus hygiene policies.

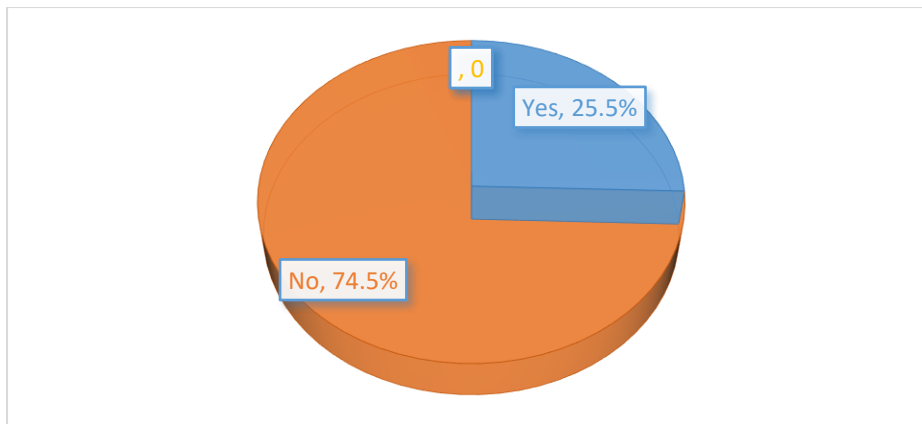


Field Survey, 2025

Fig 1: Respondents' views on when students are more likely to practice open defecation

The responses in figure 1 indicate that students are most likely to practice open defecation either at night (38.5%) or at any time of the day (43%). This suggests that while night-time offers greater cover of darkness and reduced visibility, many students do not confine the practice to a specific time, implying urgency or a lack of access to toilet facilities regardless of the hour. Afternoon (14%) and morning (4.5%) were less commonly cited, possibly due to increased human activity and reduced privacy during those periods.

Research Question 2: What are the causes of open defecation among students of Nnamdi Azikiwe University, Awka?



Field Survey, 2025

Figure 2: Respondents' views on if they have well-maintained toilets in their departments and faculties

Figure 2 reveals that 74.5% of the respondents reported that there are no well-maintained toilets in their departments and faculties, while only 25.5% affirmed the presence of such facilities. This overwhelming lack of functional sanitation infrastructure on campus points to a critical deficiency that likely contributes to the prevalence of open defecation observed in earlier findings. The absence of clean and accessible toilets not only affects hygiene and public health but also undermines students' dignity and comfort on campus.

Table 4: Respondents' views on the primary reason for open defecation on campus

Responses	Frequency	Percent
Insufficient toilet facilities	92	46.0
Poor maintenance of toilet facilities	81	40.5
Lack of water supply in toilet facilities	20	10.0
Other	7	3.5
Total	200	100.0

Field Survey, 2025

The result in table 4 indicate that the leading cause of open defecation on campus is insufficient toilet facilities, as identified by 46% of respondents. This is closely followed by poor maintenance of existing toilets at 40.5%, showing that even where facilities exist, their condition deters use. Additionally, 10% cited the lack of water supply in toilet facilities as a key factor, emphasizing that proper sanitation infrastructure must include reliable water access. Moreover, 3.5% of the respondents attributed the issue to other unspecified reasons.

Table 5: Respondents' views on how often they encounter issues with the toilet facilities on campus

Responses	Frequency	Percent
Always	80	40.0
Often	44	22.0
Sometimes	39	19.5
Rarely	18	9.0
Never	19	9.5
Total	200	100.0

Field Survey, 2025



The data reveals that 40% of respondents always encounter issues with toilet facilities on campus, and another 22% experience problems often, meaning that a combined 62.0% face frequent challenges related to toilet usage. Additionally, 19.5% reported encountering such issues sometimes, suggesting that for many students, unreliable toilet conditions are a recurring inconvenience. Only 9% said they rarely experience problems, while 9.5% claimed they never do.

Research Question 3: What are the consequences of open defecation among students of Nnamdi Azikiwe University, Awka?

Table 6: Respondents' views on the health issue they or someone they know have experienced due to open defecation on campus

Responses	Frequency	Percent
Diarrhoea	44	22.0
Cholera	32	16.0
Typhoid fever	14	7.0
Skin diseases	56	28.0
Others	54	27.0
Total	200	100.0

Field Survey, 2025

The data shows that 28% of respondents identified skin diseases as the most commonly experienced health issue linked to open defecation on campus, followed closely by 27% who reported other unspecified health problems. Diarrhoea was noted by 22%, cholera by 16%, and typhoid fever by 7%. These percentages indicate that open defecation is associated with a broad range of health concerns, with skin-related infections and gastrointestinal illnesses being the most prominent.

Table 7: Respondents' views on the environmental impact they associate with open defecation on campus

Responses	Frequency	Percent
Increased presence of pests (e.g., flies, rodents)	30	15.0
Pollution of water sources	8	4.0
Unpleasant odours affecting the learning environment	146	73.0
Aesthetic degradation of the campus	8	4.0
Other	8	4.0
Total	200	100.0

Field Survey, 2025

The data indicates that a significant majority of respondents, 73%, associate open defecation on campus with unpleasant odours that negatively affect the learning environment. This suggests that foul smells are the most immediate and noticeable environmental consequence for students and staff, potentially disrupting academic activities and overall campus comfort. Meanwhile, 15% identified an increased presence of pests such as flies and rodents, pointing to the role of open defecation in attracting disease vectors. Only 4% each linked it to pollution of water sources, aesthetic degradation, or other impacts, which may suggest limited awareness or visibility of these issues.



Table 8: Respondents' views on how the practice of open defecation affects the overall cleanliness of the campus environment

Responses	Frequency	Percent
Significantly worsens cleanliness	140	70.0
Somewhat worsens cleanliness	34	17.0
No effect on cleanliness	8	4.0
I don't know	18	9.0
Total	200	100.0

Field Survey, 2025

The data shows that 70% of respondents believe that open defecation significantly worsens the cleanliness of the campus environment, while an additional 17% think it somewhat worsens it. This indicates that a combined 87% perceive open defecation as having a negative impact on campus hygiene. Only 4% believe it has no effect, and 9% are unsure. These findings reflect a strong consensus that open defecation contributes to environmental degradation on campus, reinforcing the need for urgent interventions such as improved toilet facilities, stricter sanitation policies, and awareness campaigns to enhance the overall cleanliness and livability of the academic setting.

Research Question 4: What measures can be put in place to curb open defecation among students of Nnamdi Azikiwe University, Awka?

Table 9: Respondents' views on measures that would most effectively reduce open defecation on campus

Responses	Frequency	Percent
Increasing the number of toilet facilities	75	37.5
Improving the cleanliness and maintenance of existing toilets	104	52.0
Implementing strict penalties for open defecation	17	8.5
Others	4	2.0
Total	200	100.0

Field Survey, 2025

The data shows that 52% of respondents believe that improving the cleanliness and maintenance of existing toilets would be the most effective measure to reduce open defecation on campus, making it the most preferred solution. Another 37.5% suggest increasing the number of toilet facilities, indicating that both access and condition are key concerns. Only 8.5% support the implementation of strict penalties, while 2% recommend other unspecified measures. These responses highlight that students prioritize functional and hygienic sanitation infrastructure over punitive approaches, suggesting that campus authorities should focus on maintaining existing facilities and expanding access to ensure a clean and accessible toilet environment.



Table 10: Respondents' views on how students can be encouraged to use designated toilet facilities

Responses	Frequency	Percent
Providing free toiletries and sanitary products	63	31.5
Ensuring 24-hour water supply in toilets	80	40.0
Creating awareness campaigns on health risks of open defecation	46	23.0
Improving lighting and security around toilets	11	5.5
Total	200	100.0

Field Survey, 2025

The data indicates that 40% of respondents believe that ensuring a 24-hour water supply in toilets is the most effective way to encourage students to use designated toilet facilities, while 31.5% suggest providing free toiletries and sanitary products. These responses emphasize the importance of reliable resources and basic hygiene materials in promoting proper toilet use. Additionally, 23% advocate for awareness campaigns on the health risks of open defecation, highlighting the role of education in behavior change. Only 5.5% consider improved lighting and security as a priority. Overall, the findings suggest that practical improvements in toilet infrastructure and access to hygiene supplies, combined with education, are key to encouraging the use of campus sanitation facilities.

DISCUSSION

This research established that open defecation is prevalent among the students of Nnamdi Azikiwe University, Awka. This finding is in line with the findings of various researches that emphasize the prevalence of sanitation issues in educational and residential environments in Nigeria. As an example, Oloruntoba et al. (2019) found that in low-income neighborhoods of Ibadan, a lack of operative sanitation systems was a major cause of open defecation, a trend that is equally prevalent in most university campuses where such systems are also deficient. In their evaluation of the hygiene of the sanitary facilities of a faculty building of the University of Ibadan, Adejumo et al. (2017) discovered that due to the lack of clean facilities, erratic water supply, and lack of cleaning staff, toilets were underutilized, and students were forced to find other options like open defecation. Similarly, Onyemaechi et al. (2013) pointed to a substantial prevalence of open defecation in both rural and urban parts of the Osun State and stated that infrastructural neglect, the absence of hygiene education, and the failure of the populace to invest in sanitation were frequent determinants. All these studies support the finding of the current research study that open defecation in Nnamdi Azikiwe University is not a singular or individual behavioural issue, but a systemic sanitation crisis in Nigerian institutions.

Insufficient toilet facilities and poor maintenance of existing toilets were found to be the major factors that promote the practice of open defecation among students in Nnamdi Azikiwe University, Awka. The finding supports the findings of other studies that underscore the sanitation crisis in Nigerian educational institutions. For instance, Effiong and Inah (2021), in a study conducted at the University of Calabar, identified poor hygiene, locked toilets during key hours, and lack of water as central factors influencing students' preference for open spaces over school toilets. In another study, Wada et al. (2021) reported that students were often forced to practice open defecation due to lack of adequate toilet facilities. These studies collectively support the current findings from Nnamdi Azikiwe University, indicating that open defecation in university environments is not a product of student irresponsibility, but rather the result of systemic infrastructural neglect and weak sanitation governance.



The study revealed that open defecation has health and environmental implications. This finding is consistent with the finding of a study by Adejumo et al. (2017) on sanitation in Nigerian tertiary institutions which revealed that poor toilet facilities and the persistence of open defecation contributed significantly to the spread of waterborne diseases such as diarrhoea, typhoid, and cholera among students, ultimately affecting their academic performance and school attendance. Similarly, a study by Ismail et al. (2024) found that exposure to human waste increased the prevalence of skin infections and gastrointestinal illnesses, particularly in overcrowded places with inadequate sanitation infrastructure. Furthermore, Akai-Tetteh (2021) found that the presence of human waste and the accompanying stench around lecture halls and dormitories led to reduced concentration levels and overall discomfort among students, creating an unfavourable atmosphere for learning. Improving the cleanliness and maintenance of existing toilets, alongside increasing the number of available toilet facilities, were identified as the most effective strategies for significantly reducing open defecation among students of Nnamdi Azikiwe University, Awka. This finding corroborated the finding of an earlier study by Sifullah et al. (2024) which revealed that people were more likely to use toilets when the facilities were clean, well-maintained, and adequately equipped with water and hygiene supplies. Additionally, research by Okesanya et al. (2024) showed that expanding toilet infrastructure and ensuring consistent cleaning routines directly correlated with a reduction in open defecation practices. These studies collectively support the assertion that both the quantity and quality of sanitation facilities are critical in promoting safe and dignified toilet use in tertiary institutions.

CONCLUSION

Open defecation among students of Nnamdi Azikiwe University, Awka, is a public health challenge that is reflective of the broader systemic challenges bedeviling tertiary institutions in Nigeria. This study reveals that open defecation is not merely a matter of personal choice or poor hygiene practices, but rather a consequence of inadequate sanitation infrastructure, poorly maintained toilet facilities, irregular water supply, and institutional neglect. This reality exposes students to significant health risks, including the spread of waterborne diseases such as cholera, typhoid, and diarrhoea, as well as psychological discomfort and reduced academic concentration due to unpleasant odours and unsanitary surroundings. In light of these insights, it is clear that addressing open defecation at Nnamdi Azikiwe University requires a multidimensional and institution-wide approach. The university management, in collaboration with student unions, government agencies, and non-governmental organizations, must work together to increase investment in sanitation infrastructure, ensure regular maintenance, and promote behavioural change through hygiene education.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations have been made:

1. The university administration should prioritize the construction of additional toilet facilities, especially in high-traffic academic areas, student hostels, and lecture halls. Toilets should be adequately distributed to reduce overcrowding and make them more accessible to students at all times.
2. A dedicated team of sanitation staff should be employed or assigned to regularly clean and maintain toilet facilities. The university should set up a strict timetable for inspection and sanitation of all restrooms, ensuring constant water supply, functional plumbing, and availability of cleaning materials to keep the facilities hygienic and functional.
3. Awareness programmes should be organized to educate students about the dangers of open defecation, personal hygiene, and the importance of using toilet facilities. These



campaigns can be integrated into orientation programs, health weeks, and student association activities to promote responsible sanitation practices.

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Consent for publication

Not applicable. No identifiable personal information or images of individuals are included in this manuscript.

Availability of data and materials

The datasets generated and analyzed during this study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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