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RESEARCH ARTICLE OPEN ACCESS

Assessment of Compliance with Mandatory Government Policy on Environmental Sanitation in a Nigerian Urban Area

Environmental Sanitation in Nigeria

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Abstract

Objective: Poor sanitation is estimated to be responsible for about 432,000 deaths annually in low- and middle-income countries. Widespread pollution and poor public health conditions in many areas of Nigeria led to an authoritarian military regime's introduction of mandatory monthly sanitation day. Since Nigeria transitioned to a democratic government in 1999, the enforcement of “Sanitation Day” has dwindled. We aimed to assess the compliance of Akure residents with the mandatory monthly environmental sanitation policy in line with the Sustainable Development Goal (SDG) aimed at ensuring the availability and sustainable management of water and sanitation for all.

Methods: We adopted a cross-sectional study design and sampled 314 adults in Akure – an urban area in Nigeria. We used a semi-structured, pre-tested questionnaire which was developed after reviewing existing information on environmental sanitation for data collection.

Results: We found 219 (69.7%) residents reported compliance with the sanitation policy. Age, gender, ethnicity, occupation, education, house ownership, co-residence with the house owner, and perception of the effectiveness of government policy were significantly associated with environmental sanitation compliance. However, the binary logistic model shows that older age, female gender, non-Yoruba ethnicity, unemployment status, house ownership, and perception of the effectiveness of government policies are significant predictors of environmental sanitation compliance.

Conclusion: Our study showed relatively high compliance with the sanitation policy. The government needs to improve on monitoring sanitation policy compliance, not only in urban areas but especially in rural areas.

Keywords: Compliance, Cross-sectional, Nigeria, Policy, Sanitation

Plain English Summary

Nearly 432,000 deaths per year in low- and middle-income nations are attributed to poor sanitation. Following the Sustainable Development Goal (SDG), which aims to ensure the availability and sustainable management of water and sanitation for all, we evaluated Akure residents' adherence to the mandated monthly environmental sanitation policy. Our survey finds that 219 residents, or 69.7%, said they complied with the sanitation policy. Environmental sanitation compliance was substantially correlated with age, gender, ethnicity, occupation, education, ownership of a home, co-residence with the homeowner, and impression of the efficacy of government policies. Improved government funding, oversight, and enforcement of appropriate sanitation procedures are necessary at all levels.

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Background

Sanitation is defined as the science and process of keeping places clean and healthy by gathering and disposal of faecal and communal liquid waste hygienically to avoid endangering the health of both people and the community as a whole (1, 2). Environmental sanitation includes managing solid waste, wastewater, human excreta control, as well as pest and vector control (3). The World Health Organization (WHO) Expert Committee on Environmental Sanitation explained environmental sanitation as including "the regulation of local water supplies, excrement and wastewater disposal, waste disposal, disease vectors, housing conditions, food handling and supply, atmospheric conditions, and workplace safety" (4).

Globally, more than 1.7 billion persons do not have access to basic sanitation facilities and about 494 million of these people pass faeces in the open including bodies of water, bushes or street gutters. Poor sanitation is estimated to be responsible for about 432,000 deaths in developing and low-income countries yearly (5). Poor environmental sanitation has been associated with the transmission of communicable diseases including polio, cholera, dysentery, typhoid, and several neglected tropical diseases. These increase the risk of stunting in children and the spread of antimicrobial resistance (5). Target 6.2 of the Sustainable Development Goals also calls for everyone to have access to decent and fair sanitation.

Environmental sanitation in Nigeria is a conspicuous problem due to a lack of infrastructure, proper waste management systems, and enforcement of regulations. This has led to widespread pollution and poor public health conditions in many areas of the country. The Nigerian Government under the military leadership of Generals Mohammadu Buhari and Tunde Idiagbon from 1983–85 introduced a Sanitation Day in their War Against Indiscipline (WAI) campaign. The Sanitation Day which is held on the last Saturday of every month from 7–10 a.m. restricts commercial or social activities and all forms of vehicular or pedestrian movement (except for those on essential duties) (6). This was enforced during the military regime. However, since Nigeria transitioned to a democratic government in 1999, the enforcement of Sanitation Day is believed to have dwindled. For instance, on November 23, 2016, Lagos state, the second most populated state and economic capital of Nigeria, cancelled the environmental sanitation mandate because it was a military idea and it was unlawful to restrict the movement of its citizens (7). Nevertheless, most states in Nigeria still observe the Sanitation Day on the last Saturday of every month.

The Nigerian government made notable efforts to address the issue of environmental sanitation through various initiatives, such as the Federal Environmental Protection Agency (FEPA), the National Environmental Standards and Regulations Enforcement Agency (NESREA), the State Environmental Protection Agency (SEPA), and through the Ministry of Health, Local Government Health Delivery Institutions, and Primary Healthcare Centres. Unfortunately, implementation has been hindered by a lack of funding and political will. Additionally, cultural and economic factors also contribute to the poor state of environmental sanitation in Nigeria, as many people do not have access to proper sanitation facilities and may resort to open defecation or indiscriminate disposal of waste.

In the colonial era of Nigeria, sanitary inspectors were assigned and saddled with the responsibility of overseeing the sanitation of houses and the environment. This was aimed at combating the spread of diseases such as cholera, malaria, yellow fever, and typhoid. Their tasks include daily sanitary inspection, identifying mosquito breeding sites, collection of water samples, identifying dilapidated buildings, identifying infectious disease cases, disinfection, disinfestations, and health education. In recent years, these sanitary inspectors (now referred to as Environmental Health Officers) have dwindled in their roles in monitoring and enforcing health and hygiene legislation. Physical, cultural, and economic factors have been reported to limit participation in environmental sanitation in Nigerian communities (8). Ondo, also known as the Sunshine State, is one of the many Nigerian states which has strictly adhered to the mandatory monthly environmental sanitation exercise. Our study sought to assess the compliance of Akure residents with the mandatory monthly environmental sanitation exercise.

Materials and methods

Study area and design

Akure is a large city and the capital city of Ondo State, Nigeria. Akure is located between 7°25' north of the equator and 5°19' east of the Meridian. It is about 700 km (430 mi) southwest of Abuja and 311 km (193 mi) north of Lagos State. The estimated population of Akure residents in 2022 was 716,815 (9). Akure is divided into two Local Government Areas (LGAs) namely Akure South and Akure North. Akure North LGA was selected for this study. The rationale for this was to manage survey resources and save time knowing that the population in both LGAs are similar. The sample

size needed for this study could also be obtained from Akure North LGA. Akure North is divided into 12 political wards. These are Oba-Ile, Agamo/Oke-Ore/Akomowa, Igoba/Isinigbo, Isimija/Irado, Ayede/Ogbese, Ayetoro, Igbatoro, Iluabo/Eleyowo/Bolorunduro, Moferere, Odo-Oja/Ijigbo, Oke Iju, and Oke-Afa/Owode (10).

This research adopts a cross-sectional study design. The study participants are residents of Akure North LGA, aged 18 years and over, willing to give consent, and without intellectual disability. The sample size (households) needed for the study was calculated using Fisher's formula for population size >10,000.

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Where n= desired sample size, Z = the standard normal deviate, 1.96 at 95% confidence level, p = prevalence = 71% (the percentage of households with access to an improved sanitation facility in Southwest, Nigeria), and d = degree of precision = 0.05.

The estimated sample size needed for this survey was 317 households.

Data collection

The cross-sectional data were collected in May 2022. A semi-structured questionnaire which was developed after reviewing existing information on environmental sanitation was used in obtaining data. Before the main study, the questionnaire was pre-tested with 20 participants in Akure South LGA to ensure that the questions were unambiguous, relevant and captured the variables of interest. The demographic characteristics of Akure South LGA are similar to Akure North LGA, hence, the reason the questionnaire was pretested in the LGA. The questions captured the demographic characteristics, housing conditions, perception, and compliance with the mandatory monthly environmental sanitation exercise.

The face and content validity were then verified by epidemiologists and biostatisticians in the Department of Public Health, Afe Babalola University, Ado-Ekiti, Nigeria. The questionnaire was self-administered to the oldest adult who met the inclusion criteria in each household in the study area at the time of the visit.

Data management and analysis

Data were checked for errors, cleaned, and manually entered for analysis. Data were analysed using IBM SPSS version 28.0 statistical software. Data analysis employed both descriptive and inferential statistics. Descriptive statistics were presented in frequencies, percentages, means, and standard deviation. Pearson's Chi-square test was used to assess if a relationship exists among categorical variables. Multivariable analysis using a binary logistic regression model was used to determine factors that significantly predict compliance with the mandatory environmental sanitation exercise. The final regression model included eight significant factors when the p-value was set at 0.25 in the bivariate analysis. The use of this p-value was recommended by Hosmer Jr Lemeshow (11) because the use of the conventional level ($p<0.05$) often fails to select important variables.

Results

The sociodemographic characteristics of the participants are presented in Table 1. This shows participants were mostly male (68.2%), Yoruba (55.5%), married (62.1%), and Christians (70.4%). Of the 314 adults who completed the survey, 219 (69.7%) reported that they took part in the mandatory monthly environmental sanitation exercise.

Table 1: Socio-demographic characteristics of the participants

Characteristics	Frequency	Per cent
Age (years)		
<30	64	20.4
30-39	83	26.4
40-49	85	27.1
50 and over	82	26.1
Mean (SD)	41.9 (12.9)	
Gender		
Male	214	68.2
Female	100	31.8
Ethnicity		
Yoruba	174	55.4
Hausa	24	7.6
Igbo	86	27.4
Others	30	9.6
Religion		
Christianity	221	70.4

Islam	66	21.0
Traditional	27	8.6
Marital status		
Single	86	27.4
Married	195	62.1
Divorced/separated	26	8.3
Widowed	7	2.2
Occupation		
Student	19	6.0
Employee	212	67.5
Self-employed	63	20.1
Unemployed	20	6.4
Education		
No education	19	6.0
Primary	27	8.6
Secondary	147	46.8
Vocational	25	8.0
Tertiary	96	30.6
House ownership		
Yes	135	43.0
No	179	57.0
Co-residence with the house owner		
Yes	66	21.0
No	113	36.0
Not applicable	135	43.0

Table 2 shows that there was a significant association between compliance with the mandatory monthly environmental sanitation policy and age, gender, ethnicity, occupation, education, house ownership, co-residence with the house owner, and the perception of the effectiveness of the mandatory government policy ($p < 0.05$).

Table 2: Association between compliance and study variables

Variable	Compliance			
	Yes N (%)	No N (%)	χ^2	p-value
Overall	219 (69.7)	95 (30.3)		
Age (years)				
< 30	54 (84.4)	10 (15.6)	32.085	**<0.001**
30-39	56 (67.5)	27 (32.5)		
40-49	41 (48.2)	44 (51.8)		
50 and over	68 (82.9)	14 (17.1)		
Gender				
Male	132 (61.7)	82 (38.3)	20.703	**<0.001**
Female	87 (87.0)	13 (13.0)		
Ethnicity				
Yoruba	101 (58.0)	73 (42.0)	29.564	**<0.001**
Hausa	17 (70.8)	7 (29.2)		
Igbo	72 (83.7)	14 (16.3)		
Others	29 (96.7)	1 (3.3)		
Religion				
Christianity	151 (68.3)	70 (31.7)	0.849	0.654
Islam	49 (74.2)	17 (25.8)		
Traditional	19 (70.4)	8 (29.6)		
Marital status				
Single	58 (67.4)	28 (32.6)	6.367	0.095
Married	132 (67.7)	63 (32.3)		
Divorced/separated	22 (84.6)	4 (15.4)		
Widowed	7 (100.0)	0 (0.0)		
Occupation				
Student	12 (63.2)	7 (36.8)	11.133	**0.011**
Employee	154 (72.6)	58 (27.4)		

Self-employed	35 (55.6)	28 (44.4)		
Unemployed	18 (90.0)	2 (10.0)		
Education				
No education	19 (100.0)	0 (0.0)	13.669	**0.008**
Primary	16 (59.3)	11 (40.7)		
Secondary	95 (64.6)	52 (35.4)		
Vocational	16 (64.0)	9 (36.0)		
Tertiary	73 (76.0)	23 (24.0)		
House ownership				
Yes	107 (79.3)	28 (20.7)	10.159	**0.001**
No	112 (62.6)	67 (37.4)		
Co-residence with the house owner (n=179)				
Yes	52 (78.8)	14 (21.2)	11.742	**<0.001**
No	60 (53.1)	53 (46.9)		
Effectiveness of government policy				
Effective	169 (81.3)	39 (18.8)	36.649	**<0.001**
Ineffective	50 (47.2)	56 (52.8)		

Table 3 illustrates the findings of the multivariable binary logistic regression analysis. The result shows that older adults aged 50 years and over were almost three times more likely to comply with the monthly environmental sanitation compared to younger adults. Females were about eight times more likely than males to comply with the mandatory exercise. Other significant predictors of compliance with the mandatory monthly exercise include ethnicity, occupation, house ownership, and perception of the effectiveness of the environmental sanitation policy.

Table 3: Predictors of compliance with the mandatory monthly environmental sanitation exercise

Variable	β	AOR	95% CI	p-value
Age (years)				
Less than 50		1		
50 and over	1.07	2.93	1.38 – 6.19	**0.005***
Gender				
Male		1		
Female	2.07	7.98	3.68 – 17.30	**<0.001***
Ethnicity				
Yoruba		1		
Others	1.05	2.85	1.51 – 5.39	**0.001***
Marital status				
Not married or de facto		1		
Married or de facto	0.32	1.37	0.69 – 2.72	0.362
Occupation				
Employed		1		
Unemployed	1.18	3.25	1.18 – 8.94	**0.023***
Education				
Tertiary		1		
No tertiary education	0.03	1.03	0.53 – 2.03	0.923
House ownership				
No		1		
Yes	1.05	2.85	1.50 – 5.39	**0.001***
Effectiveness of government policy				
Ineffective		1		
Effective	1.48	4.39	2.38 – 8.07	**<0.001***

*: *P*-value < 0.05; AOR: adjusted odds ratio; 95% CI: 95% Confidence Interval

Discussion

Three hundred and fourteen adults gave consent and participated in this study. Our study findings show that most participants (69.7%) reported compliance with the environmental sanitation exercise. We found that those aged 50 years and over were about three times more likely to comply with the sanitation exercise compared with other

age groups. Those aged 50 years and over were at least 10 years old when the mandatory sanitation day was introduced during the authoritarian regime. This may be one of the reasons they were more likely to comply with the regulation unlike the generation born after the military era.

More females (87%) reported compliance with the environmental sanitation exercise than males (61.7%). Females were found to be about eight times more likely to comply with mandatory environmental sanitation than males. This is expected as females are more involved in housekeeping than males. In contrast, a study of 129 people with disabilities in Indonesia found no significant association between gender and participation in sanitation programs (12).

The study area is predominantly inhabited by the Yoruba ethnic group. Interestingly, we found that the Yorubas had the lowest level of compliance compared with other ethnic groups. The Yorubas occupy the Southwestern region of Nigeria. The demographic and health survey conducted in 2018 shows that the region had the highest percentage of households (71%) with access to a better standard of sanitation (13). Despite this, the 2021 Water Sanitation and Hygiene National Outcome Routine Mapping (WASHNORM) survey report shows that the Southwest ranks second in open defecation at 24% (14). This is also similar to the statistics reported at the national level. It was reported that the proportion of persons practising open defecation has not reduced since 2019, but increased from 46 million to 48 million in 2021, despite an increase in the number of people with access to basic sanitation services (14). This practice could likely be attributed to the convenience and absence of environmental sanitation enforcement by the authorities and the environmental health officers whose duty is to enforce compliance. These policies aimed toward providing sanitation facilities, monitoring and enforcing sanitation practices need improvement, and effective implementation to achieve feasible results (15).

We found no statistically significant relationship between sanitation compliance and religion ($p = 0.654$) and marital status ($p = 0.095$). Our finding on the correlation between religion and sanitation compliance is similar to a study in India that used three nationally representative datasets to analyse the sanitation habits of Hindus and Muslims living in the same areas (16). Their study reported that there was no proof of religion-associated differences in sanitation habits, such as regular handwashing or observed faecal waste near dwellings. They concluded that household sanitation practices vary across areas in India, but religion has less direct influence when considering differences between Hindus and Muslims within the same location (16). In our study, the mix of individuals with varied marital situations within the community may not have directly influenced their sanitation practices. Sanitation might be argued to be more of a behavioural function as well as a personal preference (17). The reason for this could be that the levels of awareness, communication campaigns, and education now cut across religions or marital status, although more noticeable in urban areas. As a result, regardless of one's religion or marital status, there is a level of expected sanitation within the community that people are socially obliged to meet (18).

Our study found that unemployed participants were three times more likely than those who were employed to comply with the sanitation exercise. It is important to note that the motivations for unemployed individuals to participate in sanitation exercises may vary depending on individual circumstances, personal goals, and community dynamics, and are mostly due to time on their hands. Other reasons for our findings could be because participating in sanitation exercises can offer an opportunity for unemployed people to learn new skills or improve existing ones they may require, broaden their network and interact with individuals and organizations working in environmental efforts or community development, and these can be easily achieved through volunteering. The unemployed may also participate in cleaning exercises since it allows them to actively contribute to environmental sustainability, cleanliness, and improvement of public health, which can increase their self-esteem and well-being.

We found that those who lived in their own house were about three times more likely to comply with the mandatory monthly exercise compared with those who rented the houses they lived in. This may likely be a result of a sense of responsibility to ensure their property is well maintained. Our study sampled residents in an LGA in Akure which is an urban area. Our findings may not be generalizable to rural areas in the state where sanitation monitoring and enforcement may not be prioritized. Those who perceived that the government policy on environmental sanitation was effective were about four times more likely to engage in monthly environmental sanitation compared with those who perceived the policy as ineffective. About 66% of the participants in our study agreed that the government policy on environmental sanitation was effective. This is higher than 36.7% reported in a cross-sectional survey of 306 residents of Ile-Ife, Nigeria who were satisfied with the effectiveness of the policy (19).

Research on compliance with the mandatory monthly environmental sanitation day in Nigeria

is limited. Our study used a cross-sectional design restricting its ability to establish causal associations. Our analyses are based on self-report and could be subject to respondent or recall bias.

Conclusion

Our study shows that most of the participants reported compliance with the mandatory monthly environmental sanitation exercise. House owners should encourage active environmental sanitation participation of their tenants thus improving sanitation compliance levels in the state. It is recommended to have this survey conducted on the environmental sanitation day to see how many people are actively engaged and what sanitation activities are carried out. The magnitude of non-compliance and limitations to monthly environmental sanitation in rural areas in Ondo State and nationwide may need to be investigated. This can be achieved using a mixed-method approach.

List of Abbreviations

FEPA: Federal Environmental Protection Agency
LGA: Local Government Areas
NESREA: National Environmental Standards and Regulations Enforcement Agency
SDG: Sustainable Development Goal
SEPA: State Environmental Protection Agency
WAI: War Against Indiscipline
WASHNORM: Water Sanitation and Hygiene National Outcome Routine Mapping
WHO: World Health Organization

Declarations

Ethical approval and consent to participate

Ethics review and clearance were obtained from the Afe Babalola University Ethics Review Committee (ABUADHREC/28/03/2022/008). Verbal consent was requested and received from the participants before the questionnaires were administered to them. Participants' confidentiality, right to withdraw, and the purpose of the study were clearly explained.

Consent for publication

All the authors gave consent for the publication of the work under the Creative Commons Attribution Non-Commercial 4.0 license.

Availability of data and materials

The dataset has been deposited to a public repository and can be retrieved from https://doi.org/10.17605/OSF.IO/57AXW

Competing interests

The authors declare there is no conflict.

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None

Authors' contributions

OO: Conceptualization, Methodology, Investigation, Supervision, Writing - Original Draft, Writing - Review & Editing; FA: Methodology, Validation, Formal analysis, Data Curation, Writing - Original Draft, Writing - Review & Editing; FC: Validation, Formal analysis, Writing - Review & Editing; VM: Conceptualization, Methodology, Investigation, Writing - Original Draft; OIT: Investigation, Supervision; OoT: Investigation, Supervision.

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