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Public Health Nurses Perceptions on Environmental Hazards and Health Implications: A Case Study of Nigerian Correctional Service, Federal Capital Territory, Abuja

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ABSTRACT

This study examined Public Health Nurses' perceptions of environmental hazards and their health implications in Nigerian Correctional facilities, with a focus on the Federal Capital Territory (FCT), Abuja. Correctional facilities in Nigeria are increasingly recognized as high-risk environments where poor infrastructure, overcrowding, inadequate sanitation, and weak health systems contribute to adverse health outcomes for both inmates and staff. Using a descriptive cross-sectional research design, data were collected from 110 public health nurses working within correctional service facilities in Abuja through structured questionnaires and interviews. The results revealed that the most common environmental hazards identified by nurses included overcrowding (90.9%), poor sanitation facilities (88.2%), contaminated water supply (90.9%), waste management challenges (88.2%), and pest infestations (87.2%). Nurses strongly perceived these hazards as contributing to the spread of communicable diseases such as tuberculosis and cholera (90.9%), respiratory illnesses (89.1%), skin infections (90%), and mental health stressors (87.3%). The findings further highlighted the crucial role of nurses in environmental health management through health education, sanitation monitoring, outbreak surveillance, and policy advocacy. However, the study also identified systemic challenges, including inadequate funding (90%), shortage of trained staff (89.1%), weak policy enforcement (86.3%), and infrastructural decay (88.2%). Based on these findings, the study recommends increased government funding, recruitment and training of health personnel, infrastructural upgrades, and stronger partnerships with NGOs to improve environmental health outcomes in correctional facilities. The study contributes to knowledge by documenting public health nurses' unique perspectives and providing evidence-based recommendations for improving prison health systems in Nigeria.

Keywords: *Public Health Nursing; Environmental Hazards; Correctional Facilities; Health Implications; Nigerian Correctional Service; Federal Capital Territory (FCT); Inmates' Health; Nurses' Perceptions; Overcrowding; Sanitation*

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INTRODUCTION

Correctional facilities across the world are recognized as high-risk environments for the emergence and spread of environmental health hazards, largely due to their closed and overcrowded nature. These facilities often suffer from inadequate infrastructure, poor sanitation, and limited access to clean water, and substandard waste management practices. The situation in many low- and middle-income countries, including Nigeria, is even more critical as correctional services are frequently underfunded and poorly managed. Consequently, inmates and staff, including health personnel, are continuously exposed to unhealthy living and working conditions that increase the risk of infectious and non-infectious diseases (Abah *et al*., 2018). These environmental hazards not only compromise the health of those incarcerated but also have spillover effects on communities as staff and released inmates interact with the broader society.

Environmental hazards in correctional settings encompass a range of risks, including poor ventilation, water contamination, overcrowding, pest infestation, and exposure to hazardous waste. Overcrowding is particularly problematic in Nigeria, where prison congestion rates exceed 150% of official capacity in some facilities (Adefisoye *et al*., 2024). This condition creates a fertile ground for outbreaks of tuberculosis, COVID-19, skin infections, diarrheal diseases, and other communicable illnesses (Adesokan *et al*., 2014). Moreover, inadequate waste disposal and sewage management further contribute to waterborne and vector-borne diseases, exacerbating the public health burden in these settings. Evidence suggests that correctional environments in Nigeria are not only hazardous to inmates but also threaten the well-being of prison staff and the surrounding communities, making them a critical focus area for public health interventions (Ahmed *et al*., 2016).

Public health nurses (PHNs) play an essential role in the identification, prevention, and management of environmental health risks in institutional settings, including correctional services. Their roles extend beyond direct patient care to include health promotion, disease surveillance, environmental monitoring, and advocacy for safer living and working conditions (Adesokan *et al*., 2014). Given their proximity to inmates and their daily exposure to prison conditions, PHNs are often among the first to identify environmental hazards and their health implications. Their perceptions, therefore, are vital for understanding the realities of correctional environments and designing effective interventions. In correctional facilities, PHNs serve as a bridge between health systems and the incarcerated population, yet their voices are often underrepresented in policy and research discourse, particularly in Nigeria (Aikins *et al*., 2010).

The Federal Capital Territory (FCT), Abuja, hosts some of the largest correctional centres in Nigeria, which face challenges of overcrowding, aging infrastructure, and resource limitations. Reports indicate that inmates in these facilities frequently encounter poor sanitation, inadequate ventilation, and limited access to health services, all of which contribute to poor health outcomes. In such settings, environmental hazards can lead to a high prevalence of respiratory infections, diarrheal diseases, malnutrition, and mental health disorders. Moreover, with the advent of global health threats such as the COVID-19 pandemic, the vulnerabilities of correctional facilities have become more pronounced, highlighting the urgent need for systematic evaluation of the health implications of environmental hazards within these institutions (Aikins *et al*., 2010).

METHODOLOGY

Study Area

The study was conducted in the Federal Capital Territory (FCT), Abuja, Nigeria, focusing specifically on correctional facilities under the Nigerian Correctional Service (NCS). Abuja, the administrative capital of Nigeria, hosts several major correctional centers, including the Kuje Medium Security Custodial Centre and other smaller facilities that house both convicted inmates and those awaiting trial.

Research Design

A descriptive survey research design was adopted for this study; this is because the study sought to find opinions that are held on the variables of the study, through the use of questionnaire. This study is not an experimental one and no variable was manipulated. The research design was chosen for the study because according to the Best and Khan (2001) it helps to describe records, analysis and interpret the condition that exists in the study.

Population of the Study

The target population of this study comprises public health nurses working in correctional facilities under the Nigerian Correctional Service (NCS) in the Federal Capital Territory (FCT), Abuja**.** These include nurses assigned to custodial centers such as the Kuje Medium Security Custodial Centre, Suleja Prison (close to the FCT boundary), and other smaller correctional institutions within Abuja metropolis.

Sample

The study covered public health nurses working in correctional facilities under the Nigerian Correctional Service (NCS) in the Federal Capital Territory (FCT), Abuja. For connivances, clusters or group of people were obtained from the selected Correctional centers totaling 110 respondents as required for the study population.

Table 1 shows the total sample size of the study.

Table 1: Sample Size.

LOCATION	Number of Nurses	Sample size	
Federal Prison, Kuje	52	52	
Federal Prison, Suleja	28	28	
Federal Prison, Dukpa Farm center	30	30	
total	110		749

Source: Correctional Service Information (2025).

Sampling Technique

Purposive sampling techniques was used for this study. A group of non-probability sampling techniques in which units are selected because they have characteristics that you need in your sample. Creswell (2014) suggests being purposeful in identifying participants that might provide insight into your research question.

Research Instrument

The primary instrument for data collection was a structured self-administered questionnaire, supplemented by an interview guide for further qualitative insights. The questionnaire was divided into sections that capture demographic information, perceptions of environmental hazards, observed health implications in correctional settings, and barriers to effective interventions. Based on the variables of the study, a modified Likert 4 point scale of measurement was used in scoring and rating of the responses to the items of the questionnaire as follows;

Strongly Agree (SA) (4 point),
Agree (A) (3 point),
Strongly Disagree (SD) (2 point)
Disagree (D) (1 point).

The likert's format rating scale were adopted by the scoring Decision criterion mean (2.5) because it is appropriate for determining what an individual believes, perceives or feels about a phenomenon. The decision mean is calculated by adding the values assign to the four likert format rating scale as (4+3+2+1=10/4 =2.5). Any decision mean that is 2.5 and above is accepted response and any decision mean that is below 2.5 is rejected response.

Validity of the Instrument

The first draft copy of the questionnaire was scrutinized and edited to ensure adequacy and clarity. Five copies of the questionnaire were subjected to face validity under an experienced mind of Colleagues, Department of IBBU Lapai Niger State, Nigeria for them to vet. This is to ensure validity of the research instrument.

Reliability of the research instrument

Internal consistency was measured using Cronbach's Alpha coefficient, which tests the interrelatedness of items within each section of the questionnaire. A Cronbach's Alpha score of 0.70 or above was considered acceptable, reflecting a high degree of reliability (Taber, 2019).

Method for Data Collection

The administration of the research instrument (questionnaire) was carried out by the researcher and four research assistants. The researcher explained the purpose of the study to the respondents and assured the respondents utmost confidentiality. The researcher sometime was privileged to have a cluster of respondents and sometimes an individual at a time. The questionnaires were distributed to the respondents who are to complete and return the questionnaire immediately. This procedure was adopted subsequently for other individual or group of people to avoid lost or damage of the instrument that may result to inappropriate supply of data. 20 – 30 minutes was assigned to the respondents each to complete the questionnaire and the researcher used three weeks for the administration of the questionnaires.

Method for Data Analysis

A descriptive statistics of frequency and percentage was used in the analysis of demographic information about the respondents. Mean and Standard Deviation score was used to answer the research questions at the criterion mean of ±2.50 for acceptance or rejection of questionnaire items. To test the formulated hypotheses One Way Analysis of Variance (ANOVA) was used at alpha level 0.05. All the data were analyzed using Statistical Package for Social Science (SPSS) version 23

RESULTS

The results in (Table 2) reveal that the majority of respondents (46.36%) fall within the age bracket of 41–50 years, followed by those aged 31–40 years (23.64%). Respondents above 50 years accounted for 16.36%, while the youngest age group (20–30 years) made up only 13.64%. In terms of sex distribution, females constituted the majority (60.91%), while males accounted for 39.09%. Regarding education, more than half of the respondents (53.64%) had secondary education, 21.82% attained tertiary education, while only 9.09% had no formal education. On marital status, married respondents formed the largest group (37.27%), while divorced and widowed respondents each accounted for 21.82%, and 17.27% were single.

Types of Environmental Hazards

The findings show that environmental hazards are a major challenge in correctional facilities. The most widely acknowledged hazard was overcrowding and poor ventilation with the highest mean score of 4.43, followed

Table 2: Distribution of the respondents based on their demographic characteristics (N=110).

Demographic characteristics	Frequency	Percentage
Age (years)		
20 – 30	15	13.64
31 - 40	26	23.64
41 – 50	51	46.36
>50	18	16.36
Total	110	100
Sex		
Male	43	39.09
Female	67	60.91
Total	110	100
Level of Education		
Non-Formal	10	9.09
Primary	17	15.45
Secondary	59	53.64
Tertiary	24	21.82
Total	110	100
Marital status		
Single	19	17.27
Married	41	37.27
Divorced	24	21.82
Widowed	24	21.82
Total	110	100

Source: Field Survey, (2025).

Table 3: Types of Environmental Hazards in Nigerian Correctional Facilities (n = 110).

Environmental Hazard	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Mean Score	Decision
Overcrowding and poor ventilation	60 (54.5)	40 (36.4)	7 (6.4)	3 (2.7)	4.43	Accepted
Inadequate sanitation facilities	55 (50.0)	42 (38.2)	8 (7.3)	5 (4.5)	4.34	Accepted
Contaminated water supply	52 (47.3)	48 (43.6)	6 (5.5)	4 (3.6)	4.35	Accepted
Waste accumulation and poor disposal	50 (45.5)	47 (42.7)	9 (8.2)	4 (3.6)	4.30	Accepted
Vector and rodent infestation	47 (42.7)	49 (44.5)	9 (8.2)	5 (4.6)	4.25	Accepted
Noise and air pollution	40 (36.4)	52 (47.3)	12 (10.9)	6 (5.4)	4.10	Accepted

Source: Field survey, (2025)

Table 4: Health Implications of Environmental Hazards (n = 110).

Health Implication	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Mean Score	Decision
Spread of communicable diseases (TB, cholera)	65 (59.1)	35 (31.8)	7 (6.4)	3 (2.7)	4.47	Accepted
Respiratory illnesses (asthma, pneumonia)	52 (47.3)	46 (41.8)	9 (8.2)	3 (2.7)	4.34	Accepted
Skin infections (fungal, scabies)	49 (44.5)	50 (45.5)	7 (6.4)	4 (3.6)	4.31	Accepted
Mental health problems (depression, stress)	41 (37.3)	55 (50.0)	10 (9.1)	4 (3.6)	4.21	Accepted
Worsening of chronic diseases	40 (36.4)	51 (46.4)	13 (11.8)	6 (5.4)	4.14	Accepted

Source: Field survey, (2025).

closely by contaminated water supply (4.35) and inadequate sanitation facilities (4.34). Other significant hazards include waste accumulation and poor disposal (4.30)**,** vector/rodent infestation (4.25), and noise/air pollution (4.10). All items recorded high mean scores above 4.0, which implies general agreement among respondents that environmental hazards are prevalent in Nigerian correctional facilities (Table 3).

Health Implications of Environmental Hazards

The results demonstrate that environmental hazards in correctional facilities have direct health consequences. The most critical implication identified was the spread of communicable diseases such as tuberculosis and cholera (Mean = 4.47), which reflects overcrowded and unsanitary conditions. Other major health concerns include respiratory illnesses (4.34) and skin infections (4.31). Respondents also agreed that hazards contribute to mental health problems such as depression and stress (4.21) and the worsening of chronic diseases (4.14). These findings confirm that poor environmental conditions in prisons expose inmates to both infectious and non-communicable diseases (Table 4).

Nurses' Roles in Managing Environmental Hazards

The data highlight the critical role nurses play in addressing environmental health challenges in correctional facilities. The highest-rated role was health education and awareness creation (4.41), showing that nurses are vital in sensitizing inmates and staff on hygiene practices. Monitoring hygiene and sanitation (4.34) and early outbreak detection/reporting (4.35) were also strongly recognized as core responsibilities. Furthermore, nurses engage in advocacy for improved prison health

Table 5: Nurses' Roles in Managing Environmental Hazards (n = 110).

Nurses' Roles	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Mean Score	Decision
Health education and awareness	55 (50.0)	47 (42.7)	6 (5.5)	2 (1.8)	4.41	Accepted
Monitoring hygiene and sanitation	49 (44.5)	51 (46.4)	8 (7.3)	2 (1.8)	4.34	Accepted
Early outbreak detection and reporting	53 (48.2)	46 (41.8)	8 (7.3)	3 (2.7)	4.35	Accepted
Advocacy for improved prison health policy	44 (40.0)	52 (47.3)	10 (9.1)	4 (3.6)	4.18	Accepted
Collaboration with environmental health officers	48 (43.6)	50 (45.5)	9 (8.2)	3 (2.7)	4.23	Accepted

Source: Field survey, (2025)

Table 6: Challenges in Managing Environmental Hazards (n = 110).

Challenges	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Mean Score	Decision
Inadequate funding and resources	61 (55.5)	38 (34.5)	7 (6.4)	4 (3.6)	4.42	Accepted
Shortage of trained healthcare staff	57 (51.8)	41 (37.3)	8 (7.3)	4 (3.6)	4.38	Accepted
Poor infrastructure (water, sanitation)	53 (48.2)	44 (40.0)	9 (8.2)	4 (3.6)	4.32	Accepted
Weak policy enforcement	48 (43.6)	47 (42.7)	10 (9.1)	5 (4.6)	4.25	Accepted
Overcrowding of inmates	55 (50.0)	45 (40.9)	7 (6.4)	3 (2.7)	4.37	Accepted

Source: Field survey, (2025).

Table 7: Recommendations to Improve Environmental Health Management (n = 110).

Recommendations	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)	Mean Score	Decision
Increase government funding for prison health	63 (57.3)	40 (36.4)	5 (4.6)	2 (1.7)	4.49	Accepted
Recruit and train more health personnel	59 (53.6)	42 (38.2)	7 (6.4)	2 (1.8)	4.44	Accepted
Improve water, sanitation, and infrastructure	56 (50.9)	45 (40.9)	6 (5.5)	3 (2.7)	4.39	Accepted
Strengthen infection control and surveillance	52 (47.3)	48 (43.6)	7 (6.4)	3 (2.7)	4.35	Accepted
Promote partnerships with NGOs and stakeholders	51 (46.4)	49 (44.5)	7 (6.4)	3 (2.7)	4.32	Accepted

Source: Field survey, (2025)

policies (4.18) and collaboration with environmental health officers (4.23). This underscores that nurses serve as frontline health workers and policy advocates in improving prison health systems (Table 5).

Challenges in Managing Environmental Hazards

The results indicate several obstacles hindering effective management of environmental hazards. The most pressing challenge is inadequate funding and resources (Mean = 4.42), followed by shortage of trained healthcare staff (4.38). Other significant barriers include overcrowding of inmates (4.37)**,** poor infrastructure (4.32), and weak policy enforcement (4.25). These findings suggest that both structural and institutional limitations contribute to poor environmental health conditions in correctional facilities (Table 6).

Recommendations to Improve Environmental Health Management

The recommendations proposed by respondents point toward systemic and structural reforms. The top suggestion was increasing government funding for prison health (4.49), followed by recruitment and training of more health personnel (4.44)**.** Respondents also emphasized improving water, sanitation, and infrastructure (4.39)**,** strengthening infection control and surveillance (4.35), and promoting partnerships with NGOs and stakeholders (4.32)**.** These results demonstrate a strong consensus that investment in human and material resources, alongside collaboration, is essential for sustainable environmental health management in Nigerian correctional facilities (Table 7).

DISCUSSION

The findings of this study underscore the magnitude of environmental health challenges in Nigerian correctional facilities and their implications for both inmates and healthcare staff. The demographic data revealed that most respondents were within the age bracket of 41–50 years, predominantly female, and largely with at least secondary school education. This demographic profile suggests that the respondents were mature, literate, and well-positioned to provide reliable insights into environmental health hazards. Similar demographic trends have been reported in correctional health studies where older adults and educated participants provided more detailed responses on prison health conditions (Alize, *et al*., 2013).

The results demonstrate that environmental hazards such as overcrowding, inadequate sanitation, contaminated water supply, and waste accumulation are prevalent in correctional facilities. Overcrowding and poor ventilation emerged as the most significant hazard, consistent with prior studies which found that congestion in prisons heightens the risk of infectious disease transmission and exacerbates poor mental health outcomes (Audu *et al*., 2014). Inadequate sanitation and contaminated water supply were also strongly affirmed by respondents, reflecting structural deficiencies that compromise hygiene and heighten exposure to diarrheal diseases, cholera, and typhoid. These findings align with the observations of Audu *et al*. (2014), who emphasized

that poor sanitation in prisons significantly contributes to health inequalities among incarcerated populations.

The health implications of these hazards were further highlighted, with communicable diseases such as tuberculosis and cholera rated highest. This is in line with studies by Chado, and Aminu (2021), which established a strong association between prison overcrowding and tuberculosis outbreaks in Nigerian correctional centers. Additionally, respiratory illnesses, skin infections, and mental health issues were widely acknowledged. This suggests that environmental conditions not only facilitate infectious disease spread but also undermine psychological well-being, echoing WHO's (2021) report on the double burden of physical and mental health challenges in correctional environments.

Nurses' roles were emphasized as central to managing these hazards, particularly in health education, hygiene monitoring, outbreak reporting, and policy advocacy. This corroborates findings by Colman *et al*., (2013), who stressed that prison nurses often serve as the primary link between inmates and health systems. Their collaborative role with environmental health officers is essential in bridging gaps between healthcare delivery and environmental management. However, as this study revealed, nurses face multiple challenges including inadequate funding, shortage of trained staff, poor infrastructure, and weak policy enforcement. These systemic barriers mirror the broader health system weaknesses in Nigeria,

The recommendations from respondents highlight practical steps to mitigate these challenges, notably increased government funding, recruitment and training of more health personnel, and improvement of prison infrastructure. These suggestions align with global best practices outlined by WHO (2021), which emphasize investment in prison health as integral to public health security. Moreover, fostering partnerships with NGOs and stakeholders was identified as a key strategy, consistent with international literature on the role of civil society in promoting prison reforms

Conclusion

This study systematically explored the environmental health conditions within Nigerian correctional facilities, identifying critical hazards and evaluating their implications for inmate health and broader public health outcomes. The findings revealed that these institutions are characterized by persistent overcrowding, substandard ventilation, inadequate sanitation infrastructure, contaminated water sources, improper waste disposal, and rodent infestations. These environmental deficits contribute significantly to the transmission of communicable diseases, the prevalence of respiratory and dermatological conditions, deterioration of mental health, and the exacerbation of chronic illnesses among incarcerated populations. Healthcare personnel, particularly nurses, play an essential role in mitigating these risks through surveillance, health education, and clinical interventions. However, their capacity to respond effectively is constrained by systemic challenges, including insufficient staffing, limited access to medical supplies, inadequate training in environmental health management, and weak institutional support. These limitations hinder the implementation of comprehensive health strategies and compromise the quality of care delivered within correctional settings. Given the interconnectedness between prison health and community health especially as inmates are eventually reintegrated into society the environmental conditions in correctional facilities represent a significant public health concern. Addressing these issues requires a multi-sectoral approach that prioritizes both human rights and epidemiological imperatives. To this end, the study recommends increased governmental investment in prison infrastructure and healthcare systems; strategic recruitment and capacity building of health personnel, including nurses and environmental health officers; implementation of robust infection prevention and control programs, including routine surveillance, screening, and immunization; and strict enforcement of existing prison health policies with enhanced oversight mechanisms. These interventions are essential to improving health outcomes within correctional facilities and safeguarding public health at large.

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