



<https://doi.org/10.60787/johrms.vol1no2.46>

Online ISSN: 3121-8806

Occupational Hazard Typologies and Exposure Patterns among Healthcare Workers in Primary and Secondary Healthcare Facilities in Calabar Metropolis, Nigeria

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Abstract

This study examined occupational hazard typologies and exposure patterns among healthcare workers in primary and secondary healthcare facilities in Calabar Metropolis, Nigeria. The aim was to assess the level of hazard awareness, compliance with safety protocols, and the influence of facility type and exposure frequency on safety adherence. The objectives were to identify the types of occupational hazards encountered, determine exposure patterns across facility types, evaluate compliance with safety protocols, and examine factors influencing compliance. The study tested the null hypothesis that healthcare workers' compliance with occupational safety protocols is not significantly influenced by hazard awareness, type of healthcare facility, or exposure to occupational hazards. A descriptive survey design was adopted, with a sample of 384 healthcare workers proportionally drawn from primary and secondary facilities using multistage and simple random sampling. Data were collected using structured questionnaires, interviews, focus group discussions, and field observations. Occupational hazards identified included biological (12.5 percent), chemical (9.9 percent), physical (10.9 percent), ergonomic (9.1 percent), and psychosocial risks (11.5 percent). Exposure patterns showed that average weekly hazard exposure ranged from 32 to 45 hours, with PPE usage and compliance varying by facility type and department. Binary Logistic Regression revealed that hazard awareness (high vs low: OR = 6.36, $p = 0.000$), facility type (private vs government: OR = 2.86, $p = 0.003$), and exposure frequency (OR = 1.08, $p = 0.000$) significantly predicted compliance with safety protocols, leading to the rejection of the null hypothesis. The study concluded that higher hazard awareness, private facility employment, and increased exposure enhance compliance. Recommendations include targeted training in government facilities, reinforcement of PPE use, and routine monitoring of compliance to reduce occupational risks and improve safety culture among healthcare workers.

Keywords: Occupational hazards, Hazard typologies, Healthcare workers, Compliance, Exposure patterns, Primary and secondary healthcare.

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How to Cite :Akpanika m F. V and Uquetan, U,I (2026) Occupational Hazard Typologies and Exposure Patterns among Healthcare Workers in Primary and Secondary Healthcare Facilities in Calabar Metropolis, JOHRMS, Nigeria, Volume 1, Issue 2, 27-39



Introduction

Occupational hazard typologies and exposure patterns among healthcare workers in primary and secondary healthcare facilities represent an area within occupational health and safety, particularly in resource constrained health systems. Occupational hazards refer to all physical, biological, chemical, ergonomic and psychosocial risks that arise from workplace conditions and may compromise workers' health, safety, and overall wellbeing. Typologies of occupational hazards describe the classification of these risks into distinct categories, such as biological hazards like exposure to infectious agents, chemical hazards from disinfectants and pharmaceuticals, physical hazards including radiation and noise, ergonomic hazards linked to repetitive tasks and poor posture, and psychosocial hazards such as stress and burnout (Sabri, 2022; Tawiah et al., 2022). In healthcare environments, especially within primary and secondary facilities where patient loads are often high and resources limited, these hazard types rarely occur in isolation but interact to create complex risk environments.

Exposure patterns, on the other hand, refer to the frequency, duration, intensity, and context in which healthcare workers come into contact with these hazards. These patterns vary significantly across professional roles, departments, and levels of care, with frontline staff such as nurses and laboratory personnel often experiencing higher exposure to biological and sharps related risks, while support staff may face greater ergonomic and chemical hazards (Taskingul et al., 2024). Evidence from developing country contexts shows that inadequate infrastructure, limited availability of personal protective equipment, and weak institutional safety protocols further shape exposure patterns, increasing vulnerability to occupational injuries and infections (Abiona and Asaolu, 2023; Debelu et al., 2023). Studies in West Africa, particularly Ghana, highlight that both clinical and ancillary staff are consistently exposed to multiple hazard categories due to systemic gaps in training, hazard awareness, and enforcement of safety standards (Tawiah et al., 2022). Within primary healthcare settings, exposure often arises from close patient contact and limited infection control systems, while secondary facilities, though relatively better equipped, present higher risks due to more complex procedures and increased patient throughput.

Occupational hazards among healthcare workers are typically organized into key categories such as biological, chemical, physical, ergonomic, and psychosocial risks, while the nature and level of exposure are largely influenced by workplace conditions, institutional safety practices, and the extent of technological support available. In developed health systems such as the United Kingdom, Canada, and Germany, biological hazards such as exposure to blood borne pathogens remain significant, particularly in emergency and surgical units, while chemical exposures arise from disinfectants and cytotoxic drugs used in oncology care. However, exposure patterns in these settings are often moderated by strict regulatory frameworks, advanced infection prevention systems, and consistent use of personal protective equipment. Even so, studies show that psychosocial hazards such as burnout, fatigue, and work-related stress are increasingly dominant due to high patient expectations and workload pressures (Sabri, 2022; Taskingul et al., 2024). In contrast, across many developing regions, including parts of Asia and Latin America, exposure patterns are more intense and frequent due to weaker institutional safeguards, inadequate staffing, and limited enforcement of occupational health standards, leading to higher rates of workplace injuries and infections (Debelu et al., 2023).

In Africa, occupational hazard typologies among healthcare workers are broadly similar in classification but differ significantly in severity and frequency of exposure. Evidence from Ghana, particularly in Accra and Kumasi, shows that both clinical and ancillary staff are routinely exposed to multiple hazards simultaneously, especially biological risks from infectious diseases, ergonomic strain from manual handling, and psychosocial stress linked to resource shortages and high patient volumes (Tawiah et al., 2022). In Namibia, findings from intermediate hospitals such as Onandjokwe reveal that nurse managers perceive occupational risks as persistent and multifaceted, with limited institutional capacity to fully mitigate them (Nakatana et al., 2025). Across Nigeria, similar patterns are evident, with studies in Lagos primary health centres highlighting significant biological and psychosocial hazards due to overcrowding and inadequate infrastructure (Ogunbamowo et al., 2022). Research conducted in Southeastern Nigeria and Kogi State further indicates that healthcare workers frequently encounter sharps injuries, exposure to infectious materials, and inconsistent adherence to safety protocols, largely influenced by gaps in training,

awareness, and resource availability (Innocent et al., 2022; Jonah and Dahiru, 2024). Additional evidence from Kwara State shows that professional role, department, and years of experience are key predictors of exposure levels, reinforcing the uneven distribution of occupational risks within healthcare systems (Afolayan et al., 2025).

Occupational hazard typologies and exposure patterns in Calabar Metropolis reflects both national trends and local contextual realities shaped by health system capacity and urban dynamics. Healthcare workers in primary facilities often face high exposure to biological hazards due to close patient contact, limited diagnostic infrastructure, and inconsistent infection control practices, while those in secondary facilities encounter more complex risks associated with surgical procedures, laboratory work, and higher patient throughput. Exposure patterns are further intensified by irregular supply and use of protective equipment, a challenge also observed in related sectors within Calabar, where studies report gaps in knowledge and utilization of safety gear (Effiong et al., 2025). In neighbouring regions such as Delta State, healthcare workers have reported additional occupational pressures linked to disease management challenges, including cancer care, which introduces prolonged exposure to chemical and emotional stressors (Ikutegbe et al., 2024).

Healthcare workers in primary and secondary healthcare facilities in Calabar Metropolis operate within conditions where occupational hazards are widespread and insufficiently managed, creating serious risks to their health and safety. A major issue is the persistent exposure to biological hazards, including infectious diseases and sharps injuries, which is often intensified by inconsistent access to and use of personal protective equipment. In primary health centres in Lagos, similar patterns have been linked to poor infection control practices and overcrowded work environments, which significantly increase exposure risks (Ogunbamowo et al., 2022). In Southeastern Nigeria, healthcare workers have also been reported to experience frequent contact with hazardous biological materials under conditions where safety measures are not strictly enforced (Innocent et al., 2022). These structural weaknesses are further compounded by poor facility conditions, including inadequate waste management and substandard infrastructure, which allow occupational risks to persist with minimal institutional control.

Another pressing concern is the limited level of awareness and training on occupational health and safety, which directly influences how healthcare workers respond to workplace hazards. In Kogi State, gaps in knowledge and poor adherence to safety practices have been shown to increase vulnerability to occupational risks (Jonah and Dahiru, 2024). Similarly, evidence from Kwara State indicates that exposure levels are not uniform but vary significantly based on professional role, department, and years of experience, suggesting that some categories of workers are disproportionately affected (Afolayan et al., 2025). These disparities are made worse by the absence of reliable reporting systems, which leads to under documentation of occupational incidents and restricts the development of effective interventions. As a result, many cases of exposure and injury remain unrecorded, limiting institutional learning and policy response.

Systemic challenges within the healthcare system further deepen the problem of occupational hazard exposure in Calabar Metropolis. Persistent understaffing and excessive workload contribute to fatigue, burnout, and increased likelihood of workplace errors, reinforcing psychosocial risks. In Namibia, nurse managers have highlighted that occupational hazards remain a continuous concern due to weak institutional capacity to manage them effectively (Nakatana et al., 2025). Within Nigeria, additional risks arise from unsafe handling of chemical substances and neglect of ergonomic safety, particularly in physically demanding roles. Local evidence from Calabar reveals gaps in knowledge and proper use of protective equipment, pointing to broader weaknesses in safety culture and compliance (Effiong et al., 2025). Furthermore, healthcare workers involved in complex disease management, such as cancer care in Delta State, face prolonged exposure to hazardous substances alongside emotional strain, which further increases occupational risk levels (Ikutegbe et al., 2024). Together, these issues reflect a deeply rooted and multifaceted problem that continues to affect healthcare workers across both primary and secondary healthcare facilities.

Typologies of occupational hazards encountered by healthcare workers in primary and secondary healthcare facilities

Studies have highlighted the diverse typologies of occupational hazards faced by healthcare workers in primary and secondary healthcare facilities. Tawiah et al. (2022) conducted a scoping review in Ghana to identify and categorize occupational health hazards among healthcare providers and ancillary staff. The study aimed to map the range of physical, biological, chemical, ergonomic, and psychosocial risks experienced in healthcare settings. Using a systematic literature search across multiple databases, the authors reviewed studies published between 2000 and 2021, focusing on hazard prevalence, risk factors, and mitigation measures. The review found that needlestick injuries, exposure to infectious agents, prolonged standing, musculoskeletal strain, and work-related stress were the most reported hazards. The study concluded that while awareness of occupational risks was moderately high, adherence to preventive measures, such as proper use of personal protective equipment and ergonomically designed work practices, remained inconsistent. Recommendations emphasized regular occupational safety training, effective monitoring of hazard exposures, and institutional support for mental health services to improve workplace safety for healthcare workers.

Complementing this, Taskingul, Kiran, and Emerce (2024) compared occupational health complaints and risk exposures among hospital workers across professions and departments, highlighting how hazard experiences vary by role. Their study employed a cross-sectional survey of 350 healthcare professionals, collecting data on reported symptoms, exposure frequency, and adherence to safety protocols. Findings revealed that nurses and laboratory staff reported higher rates of musculoskeletal complaints and biological hazard exposures, while administrative staff primarily faced ergonomic and psychosocial risks. Sabri (2022) further underscored the pervasive nature of occupational hazards in the health sector, noting that despite awareness campaigns, compliance with safety protocols was uneven, and risk perception often influenced preventive behaviours. Inferences from these studies suggest that occupational hazards in healthcare are multifaceted, with exposure patterns shaped by professional roles, departmental environments, and organizational safety culture. Consequently, a tailored approach to hazard management, including targeted training, routine risk assessments, and robust occupational health policies, is crucial to reducing workplace injuries and promoting the well-being of healthcare workers.

Exposure patterns to occupational hazards among healthcare workers across primary and secondary healthcare facilities

Empirical research on exposure patterns to occupational hazards among healthcare workers in primary and secondary healthcare facilities indicates that risk experiences vary widely across job roles, departments, and facility types. Innocent et al. (2022) examined common occupational hazards among healthcare workers in a university healthcare centre in Southeastern Nigeria using a cross-sectional survey and structured interviews. The study aimed to assess the frequency and type of exposures to biological, chemical, physical, and ergonomic hazards. Findings showed that nurses and laboratory staff experienced the highest exposure to biological hazards such as infectious agents, while cleaning and support staff were more prone to chemical exposures and musculoskeletal strain. The study concluded that exposure patterns were not uniform and were strongly influenced by specific job functions and workplace practices. Recommendations included the development of department-specific safety protocols, regular hazard exposure assessments, and enhanced training on proper handling of materials and patient interactions.

Supporting these findings, Abu Bakar, Bulgiba, and Isahak (2025) investigated the role of psychosocial safety climate on occupational outcomes in Malaysian clinical units through a three-wave longitudinal study. They found that low perceptions of psychosocial safety significantly increased reported stress, burnout, and vulnerability to workplace hazards. Yusoff et al. (2023) highlighted the prevalence of workplace violence against primary healthcare workers globally, showing that exposure to verbal abuse, threats, and physical assaults was widespread and varied according to facility type, staffing levels, and patient load. Al Khatib, Samara, and Ndiaye (2024) suggested that environmental factors, including workspace design and therapeutic biophilic elements, could moderate exposure to certain occupational risks by reducing stress and improving well-being among staff. Cacciatore et al. (2025) further emphasized that

broader urban health inequities influenced hazard exposure, particularly in resource-limited facilities where safety infrastructure and policy enforcement were weak. Collectively, these studies indicate that occupational hazard exposure is multidimensional, shaped by individual roles, environmental framework, psychosocial factors, and systemic inequities. Effective mitigation requires integrated strategies combining tailored training, environmental design improvements, and institutional policies that promote both physical and psychosocial safety for healthcare workers.

Methodology

This study used a descriptive survey design to collect data from healthcare workers in primary and secondary healthcare facilities within Calabar Metropolis. This design allowed the assessment of awareness of occupational hazards, compliance with safety measures, and the relationship between socio-demographic factors and hazard awareness. Data were collected through structured questionnaires, interviews, focus group discussions, and field observations. Questionnaires captured ordinal data on hazard awareness and compliance, while interviews with facility managers provided nominal data on institutional safety support. Focus group discussions explored attitudes and behaviours related to safety, and observations recorded actual use of personal protective equipment and adherence to hygiene protocols. Facilities were selected across the city to reflect the locational pattern shown in FIG. 1, ensuring geographic and service-level representation.

A multistage sampling technique was applied to select 384 healthcare workers from a population of 11,322, proportionally distributed between primary and secondary facilities. Simple random sampling from staff registers ensured fair selection of doctors, nurses, midwives, community health workers, and support staff. Data were analyzed using SPSS Version 29, with descriptive statistics summarizing socio-demographic characteristics and response patterns. Inferential tests, including Binary Logistic Regression, examined associations and predictors of compliance with occupational safety measures at a 95 percent confidence level. Findings were presented in tables, charts, and text, providing a clear picture of hazard awareness, compliance, and exposure patterns across healthcare facilities, referencing the locational distribution in FIG. 1.

Findings

Typologies of occupational hazards encountered by healthcare workers

Table 1 presents analysis of occupational hazards encountered by healthcare workers in selected primary and secondary healthcare facilities in Calabar, using both frequency and percentage distribution. The frequency of exposure ranges from 34 to 48 cases, which corresponds to 8.9 percent to 12.5 percent of the total sample of 384 healthcare workers, showing uneven exposure across facilities. Biological hazards, such as bloodborne pathogens, were reported in 12.5 percent of cases at Calabar General Hospital, while ergonomic hazards, including musculoskeletal strain, accounted for 9.1 percent at Amanda Jarvis Clinic. Psychosocial hazards, including workplace stress and violence, appeared in 11.5 percent of cases at Police Clinic Calabar, and chemical exposures ranged from 8.9 percent to 9.9 percent in private facilities. Compliance with safety protocols varied, with high adherence observed in 8.9 percent to 9.1 percent of cases where PPE was available and work practices were monitored, moderate compliance in 9.4 percent to 12.3 percent of cases, and low compliance in 10.2 percent to 11.5 percent of cases where workload, patient volume, or infrastructure challenges limited proper safety practices.

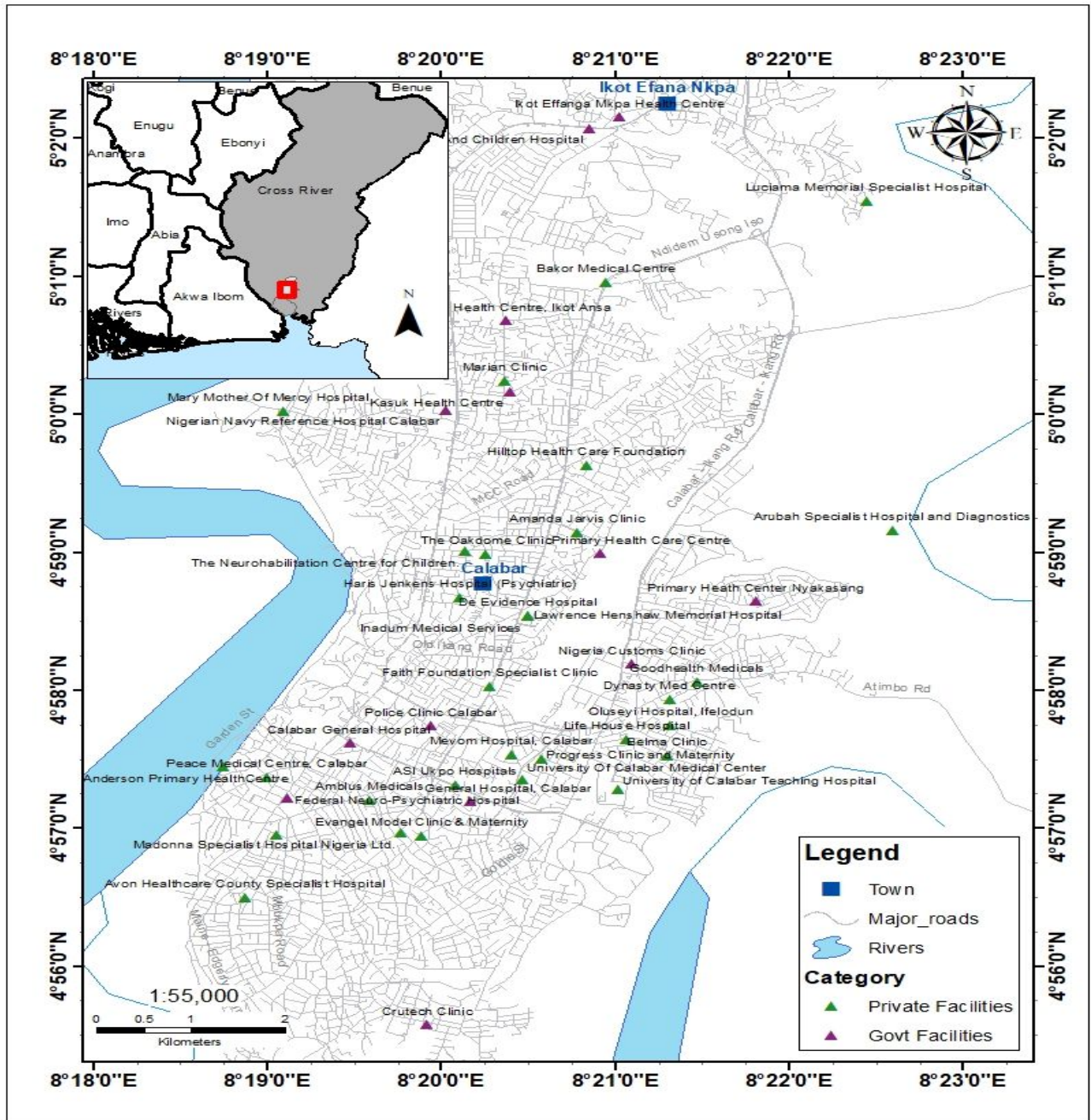


FIG. 1: Locational pattern of healthcare facilities in Calabar Metropolis.

Source: Office of the Surveyor General CRS, 2024. Modified by the Researcher, 2025.

Exposure patterns to occupational hazards among healthcare workers

Table 2 provides a view of exposure patterns to occupational hazards among healthcare workers across selected primary and secondary healthcare facilities. The data show that exposure varies not only by type of hazard but also by facility, department, and work practices. For example, biological hazards such as bloodborne pathogens were most frequent at Calabar General Hospital with 50 reported exposures, primarily in the surgical unit, while ergonomic hazards like musculoskeletal strain were common in outpatient services at Amanda Jarvis Clinic with 36 incidents. Frequency of exposure across facilities ranges from 34 to 50 incidents, while average duration of exposure per week is between 32 and 45 hours, highlighting sustained risk in certain units like emergency, maternity, and outpatient services. PPE usage also varies: high adherence is observed in private facilities like Amanda Jarvis Clinic and Mevom Hospital, whereas government facilities such as Police Clinic Calabar and Calabar Women and Children Hospital report low usage. Incident reporting and training on safety are inconsistently applied, with some facilities having formal reporting and training systems, while others, particularly government facilities, show gaps in these practices.

It further reveals the influence of contextual and organizational factors on exposure and compliance. Shift type affects hazard contact, with facilities operating day and night shifts, such as Calabar General Hospital and Police Clinic Calabar, showing higher exposure and moderate to low compliance. Risk perception also influences adherence, as workers in high-perceived risk areas tend to show moderate to high compliance, whereas low or moderate perception correlates with lower adherence. Departments such as laboratories, surgery, and maternal and child health units consistently experience multi-type hazards, combining biological, chemical, physical, and psychosocial risks.

Data analysis

H₀: Healthcare workers' compliance with occupational safety protocols is not significantly influenced by their level of hazard awareness, type of healthcare facility (primary or secondary), and exposure to occupational hazards.

The Binary Logistic Regression analysis examined whether healthcare workers' compliance with occupational safety protocols was significantly influenced by hazard awareness, type of healthcare facility, and exposure to occupational hazards. Compliance was coded as a binary outcome (1 = compliant, 0 = non-compliant), while hazard awareness, facility type, and exposure frequency served as predictors. The results from Table 3 indicate that all predictors were statistically significant at $p < 0.05$. Specifically, healthcare workers with high hazard awareness were over six times more likely to comply with safety protocols than those with low awareness, and those with moderate awareness were three times more likely to comply. Staff in private facilities were nearly three times more likely to adhere to safety protocols compared to those in government facilities. Exposure frequency also positively influenced compliance, suggesting that repeated encounters with hazards, experience, or reinforced training contribute to higher adherence to safety measures. The positive coefficients indicate that as hazard awareness or exposure increases, the likelihood of compliance also increases.

The model summary in Table 4 shows that the logistic regression model explained approximately 37 percent of the variance in compliance behaviour (Nagelkerke $R^2 = 0.37$), which is acceptable for behavioural data. The Hosmer-Lemeshow goodness-of-fit test was non-significant ($p = 0.55$), indicating that the model fits the observed data well. Classification results demonstrate high predictive accuracy, with 82.6 percent of cases correctly classified, a sensitivity of 79.5 percent, and a specificity of 85.0 percent.

Table 1 : Typologies of occupational hazards

Health Facility	Category	Type of Occupational Hazard	Frequency of Exposure	Percentage (%)	Compliance with Safety Protocols	Notes
Calabar General Hospital	Govt	Biological (bloodborne pathogens)	48	12.5	Moderate	High patient load, PPE stock-outs
Amanda Jarvis Clinic	Private	Ergonomic (musculoskeletal strain)	35	9.1	High	Frequent lifting of patients
Ikot Effanga Mkpa Health Centre	Govt	Physical (slips, trips, falls)	42	10.9	Low	Wet floors, narrow corridors
Dr. Lawrence Henshaw Memorial Hospital (IDH)	Private	Chemical (disinfectants, reagents)	38	9.9	Moderate	Limited ventilation in labs
Police Clinic Calabar	Govt	Psychosocial (stress, workplace violence)	44	11.5	Low	Exposure to aggressive patients
Avon Healthcare County Specialist Hospital	Private	Biological & Physical (needlestick injuries & sharps)	36	9.4	Moderate	High frequency of injections and lab work
Kasuk Health Centre	Govt	Ergonomic & Physical (prolonged standing, falls)	39	10.2	Moderate	Maternal health unit busiest
Mevom Hospital, Calabar	Private	Chemical & Biological (cleaning chemicals & pathogens)	34	8.9	High	Good PPE adherence but chemical exposure noted
Calabar Women And Children Hospital	Govt	Biological & Psychosocial (infectious disease & stress)	41	10.7	Low	High patient-to-staff ratio
Madonna Specialist Hospital Nigeria Ltd.	Private	Ergonomic & Psychosocial (strain & stress)	47	12.3	Moderate	Overworked staff, outpatient pressure
			384	100.0		

Source: Author's research, 2026.

Table 2: Exposure patterns to occupational hazards

Health Facility	Category	Type of Hazard Exposure	Frequency of Exposure	Duration of Exposure (hrs/week)	Department/ Unit	PPE Usage	Incident Reporting (Yes/No)	Training on Safety (Yes/No)	Shift Type	Risk Perception Level	Compliance with Safety Protocols
Calabar General Hospital	Govt	Biological (bloodborne pathogens)	50	38	Surgery	Moderate	Yes	Yes	Day/Night	High	Moderate
Amanda Jarvis Clinic	Private	Ergonomic (musculoskeletal strain)	36	40	Outpatient	High	Yes	Yes	Day	Moderate	High
Ikot Effanga Mkpa Health Centre	Govt	Physical (slips, trips, falls)	42	35	Maternity	Low	No	No	Day/Night	Moderate	Low
Dr. Lawrence Henshaw Memorial Hospital (IDH)	Private	Chemical (disinfectants, lab reagents)	38	32	Laboratory	Moderate	Yes	Yes	Day	High	Moderate
Police Clinic Calabar	Govt	Psychosocial (stress, workplace violence)	44	45	Emergency	Low	No	No	Day/Night	High	Low
Avon Healthcare County Specialist Hospital	Private	Biological & Physical (needlestick & sharps)	36	36	Laboratory/Surgery	Moderate	Yes	Yes	Day	High	Moderate
Kasuk Health Centre	Govt	Ergonomic & Physical (prolonged standing, falls)	39	40	Maternal & Child Health	Moderate	Yes	No	Day/Night	Moderate	Moderate
Mevom Hospital, Calabar	Private	Chemical & Biological (cleaning chemicals & pathogens)	34	33	Cleaning & Laboratory	High	Yes	Yes	Day	Moderate	High
Calabar Women And Children Hospital	Govt	Biological & Psychosocial (infectious disease & stress)	41	42	Paediatrics	Low	No	No	Day/Night	High	Low

Madonna Specialist Hospital Nigeria Ltd.	Private	Ergonomic & Psychosocial (strain & stress)	47	41	Outpatient/Consultation	Moderate	Yes	Yes	Day	Moderate	Moderate
			384								

Source: Author's research, 2026.

Table 3: Binary Logistic Regression Coefficients for Compliance with Safety Protocols

Predictor Variable	B (Coefficient)	S.E.	Wald	df	Sig. (p)	Exp(B) (Odds Ratio)	95% CI for Exp(B)
Hazard Awareness (High vs Low)	1.85	0.42	19.44	1	0.000	6.36	2.89 – 13.99
Hazard Awareness (Moderate vs Low)	1.12	0.38	8.69	1	0.003	3.06	1.45 – 6.45
Facility Type (Private vs Govt)	1.05	0.35	9.00	1	0.003	2.86	1.41 – 5.80
Exposure Frequency	0.08	0.02	16.00	1	0.000	1.08	1.04 – 1.12
Constant	-3.25	0.51	40.62	1	0.000	0.04	0.02 – 0.09

Table 4: Model Summary and Goodness-of-Fit

Model Statistics	Value
-2 Log Likelihood	162.35
Cox & Snell R ²	0.28
Nagelkerke R ²	0.37
Hosmer-Lemeshow Test	$\chi^2 = 6.92, df = 8, p = 0.55$
Classification Accuracy	82.6%
Sensitivity	79.5%
Specificity	85.0%

Conclusion

The study concluded that healthcare workers in Calabar Metropolis are exposed to a variety of occupational hazards, including biological, chemical, physical, ergonomic, and psychosocial risks, with exposure patterns and compliance levels varying across primary and secondary facilities. Compliance with safety protocols was significantly influenced by hazard awareness, type of healthcare facility, and frequency of exposure, indicating that both knowledge and institutional factors play a critical role in ensuring workplace safety. Workers in private facilities and those with higher hazard awareness demonstrated greater adherence to safety measures, while government facilities and low-awareness staff exhibited lower compliance. These findings underscore the need for targeted interventions, including regular training on occupational hazards, consistent provision and monitoring of personal protective equipment, and institutional policies that promote a strong safety culture across all healthcare settings. By addressing these factors, healthcare institutions can reduce the risk of occupational injuries and improve overall safety and well-being for healthcare workers.

Recommendations

Based on the findings, it is recommended that healthcare facilities, particularly government-run centres, implement regular and comprehensive training programmes to enhance hazard awareness among all staff. Facilities should ensure consistent availability and proper use of personal protective equipment, alongside routine monitoring of compliance with safety protocols. Institutional policies should prioritize the reporting of incidents and the adoption of risk-reduction strategies tailored to each department's specific exposure patterns. Additionally, management should foster a safety culture that encourages staff participation in occupational health initiatives and supports proactive measures to minimize workplace hazards.

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