

Research article

Assessment of Occupational Hazards and Safety Measures Among Health Care Workers in Northern Nigeria

Sarah Nuhu Kase¹, Esther Luka Abdulkarim², Garba Ninani³, Dennis Amaechi^{4*}, Christy Chinyere Fredrick⁵, Danladi Jonah⁶ and Magdaline Joseph Kwaji⁷

¹Department of Medical Laboratory Science, Faculty of Allied Health Sciences, Kaduna State University, Nigeria.

²Medway NHS Foundation Trust, ME7 5NY.

³Department of Medical Laboratory Science, Faculty of Allied Health Sciences, Kaduna State University, Nigeria.

⁴Department of Biochemistry, Veritas University, Abuja, Nigeria.

⁵Faculty of Nursing and Allied Health Sciences, Department of Medical Laboratory, University of ABUJA.

⁶Department of Community Medicine, Faculty of Clinical Sciences, College of Medicine, Kaduna State University.

⁷National Biotechnology Research and Development Agency, Abuja, Nigeria.

Article Info

Keywords: Occupational Hazards, Safety, Health Workers and Risk factors.


***Corresponding:**

dennisa@veritas.edu.ng

Received: 02.10.2025

Accepted: 23.10.2025

Published: 01.11.2025

 © 2025 by the author's. The terms and conditions of the Creative Commons Attribution (CC BY) license apply to this open access article.

Abstract

Introduction: Health workers are exposed to various occupational hazards from their day to day activities, which can be life threatening to them, their families, their patients and the society at large. Safety measures help to prevent or reduce the risk of exposure to occupational hazards by health workers.

Aim and objectives: The purpose of this study is to assess the occupational hazards experienced by health workers of Hajiya Gambo Sawaba general hospital Zaria city, the safety measures they practice and the various factors that affect their practice of the safety measure.

Methodology: A cross-sectional study on 46 health workers was conducted from March to May, 2019 using structured questionnaires to obtain demographic information from respondents and the data obtained was analysed using statistical package for social science (SPSS) version 20.

Results: Among the respondents, 22 (47.8%) reported that sharps/needle stick injury which is a biological hazard was the most experienced hazard followed by stress 19 (41.3%) a psychosocial hazard. The most practiced safety measure were wearing gloves which was practiced by almost all the respondents 45 (97.8%). Adequate staffing 28 (60.9%) and avoiding prolonged standing 30 (65.2%) were the least practiced safety measures. However, Chi-square analysis revealed that, the relationship between Biological hazards variables was statistically significant $X^2(5, N=46) = 34.35, p < 0.001$.

Discussion, Conclusion and Recommendations: Even though the practice of safety measures was very much average, there is still need for more staff recruitment, regular training on safety measures and an increase in the supply of personal protective equipment to reduce the risk of exposure to various hazards especially biological hazards. This study showed that, health workers experience several occupational hazards as such they practice most of the safety measures to a significant level which led to reduced risk of exposure to various hazards.

1. Introduction

The healthcare work force is one of the largest work forces in the world constituting over 12% of the working population of the world [1]. Healthcare workers are at risk of occupational health hazards at their workplace just like any other worker [2]. However, in large facility operations and maintenance, healthcare workers are continuously exposed to heavy metals and solvents as well as those hazards that are unique to caring for ill patients [3]. Occupational hazard is a dangerous phenomenon, substance, human activity or condition that may cause illness, injury or loss of life of a health worker at the hospital [4]. Safety measures are practices or techniques used by health workers in the hospital to prevent or reduce the effect of a health hazard. Health workers [5]. Workers in the hospital whose job description involves rendering health care or any health related service to people either directly or indirectly [6].

According to the international Labour Organization 2018, millions of health workers suffer from work related diseases and many succumb to occupational hazards [7]. Occupational hazard is defined as ‘the short-term and long-term dangers or risks associated with unhealthy workplace environments’ [8]. Occupational safety is the control of hazards in the work place to achieve an acceptable level of risk while workplace safety generally refers to the process of protecting the health and safety of staff while on the job, irrespective of vocation [9, 10]. According to Joseph and Joseph (2016), the healthcare workers are at greatest risk are doctors, nurses, laboratory technicians and medical waste handler [11]. Health workers are regularly exposed to several biological, chemical, physical, psychosocial and mental hazards during care delivery process which may be in some instances life threatening [12].

These include but not limited to sharp related injuries, direct infections, stress, assault from patients and their relatives, allergies, back pain and other musculoskeletal injuries [13]. These hazards have been linked to long-term adverse health effects like cancer and adverse reproductive outcomes [14]. Occupational hazards puts healthcare workers at risk of increased morbidity and mortality. Loss of skilled health personnel will adversely affect healthcare services which are suboptimal in developing countries such as Nigeria which has one of the largest pools of healthcare workers in Africa [15] and they make up about one-third of the total workforce in Nigeria. The multiplying effects of occupational injuries and diseases among health workers include; economic loss, physical loss and psychosocial disorders such as stress and depression. These effects have an overall negative impact on the workers, their families and the nation at large [16].

In Nigeria, healthcare workers are poorly prepared or equipped to handle occupational hazards and therefore sustain injuries/illnesses while performing their duties [17]. The vulnerability of these health workers in the healthcare facilities is compounded by the inadequacy of facilities with equipment that could enhance best practice in developing countries [18]. This vulnerability therefore threatens the quality of healthcare delivery especially among the doctors and nurses whose job descriptions entails having direct contacts with the patients. It is therefore important that the health workers know the potential occupational hazards and the safety measures in order to effectively utilize the safety measures and improve their productivity in terms of healthcare and their overall wellbeing. This study therefore assessed the occupational hazards experienced by the health workers, the safety measures available and the various factors that affect the practice of the safety practices among the health workers.

2. Materials and Methods

This study was a descriptive cross-sectional survey that was conducted from March to May 2019. The sampling location was Hajjiya Gambo Sawaba general hospital, Zaria city, Kaduna state Nigeria. It is a secondary healthcare center located in Kofangaya, Zaria city in Zaria local government, Kaduna state established and commissioned in 1975 and it is directly under Kaduna state Ministry of Health. This secondary health institution has two wings: the maternity and the general wing with 7 wards. The hospital has a capacity of about 200 beds and comprises of about 9 doctors, 42 nurses, laboratory scientists and pharmacists among other staff. A letter of introduction was obtained from the head of department and an ethical clearance was obtained from Head of Department, Nursing services Hajjiya Gambo Sawaba general hospital while consents were obtained from the respondents.

The study population consisted of the doctors, nurses, and laboratory scientists in all the wards, clinics and laboratories in the hospital during the morning and afternoon shifts. Records from the hospital indicated that there were about 66 health workers in the hospital. A minimum sample size of 60 was calculated using SLOVIN’S Formula. A total of 53 questionnaires were distributed and 47 were retrieved giving a response rate of 88.68%, after checking for completeness, 46 questionnaires were analyzed. Data was collected using a structured self administered questionnaire. The questionnaire was constructed by adopting from previous questionnaires done on similar topics and modified accordingly to fit the objectives of the research. Data was collected using a structured self administered questionnaire. This questionnaire consisted of both open ended and closed ended questions that are related to the socio-demographic characteristics, occupational hazards in the hospital and its effects, safety measures practiced by the health workers and factors that affect the practice of the safety measures among the health workers in Hajjiya Gambo Sawaba general hospital, Zaria city.

Data analysis

After checking its completeness, collected data was analyzed using Statistical package for social sciences (SPSS) version 20. Descriptive statistics was used to summarize the socio demographic characteristics, occupational hazards experienced by the health workers, safety measures used by the health workers and factors affecting the practice of the safety measures by the health workers.

3. Results

3.1. Socio-Demographic Characteristics

Majority of the respondents were nurses 32 (69.6%). Regarding the age range, 58.7% of the respondents were aged between 20-30 years followed by ages 31-40 years (30.4%). Thirty-five (76.1%) of the respondents are Hausa and 71.1% of the respondents are married while 80.4% practice islam. A majority of the respondents (67.1%) had practiced for 1-10 years. Only 6.5% of the respondents had practiced for above 20 years.

Table 1: Sociodemographic characteristics of the respondents

Variables	Frequency	Percentage (%)
Age		
20-30- years	27	58.7
31-40 years	14	30.4
41-50 years	3	6.5
Above 50 years	2	4.3
Total	46	100.0
Sex		
Male	10	21.7
Female	36	7.3
Total	46	100.0
Ethnic group		
Hausa	35	76.1
Igbo	3	6.5
Yoruba	2	4.3
Others	6	13.0
Total	46	100.0
Marital Status		
Single	13	2.3
Married	33	71.1
Total	46	100.0
Occupation		
Doctor	6	13.0
Nurse	32	69.6
Laboratory scientist	8	17.4
Total	46	100.0
Duration of Practice		
1-10 years	31	67.4
11-20 years	12	26.1
Above 20 years	3	6.5
Total	46	100.0

3.2. Occupational Hazards Experienced by The Health Workers

4 (8.7%) of the respondents have never experienced biological hazard. While Sharps/Needle stick injury (47.8%) is the most experienced biological hazard by the respondents. 37.0% of the respondents have never experienced any chemical hazard and 41.3% of the respondents have stress among the psychosocial hazards while 30.4% of them have experienced 2 or more of the psychosocial hazards. For the ergonomic hazard, musculoskeletal (26.1%) hazard is the most experienced while excess noise is the most experienced physical hazard. A majority of the respondents (54.3%) have never experienced any electrical hazard and only 15 (32.6%) of the respondents have experienced any fire hazard.

3.3. Safety Measures Practiced by Health Workers in The Hospital

The most practiced safety measure by the respondents is Wearing of gloves when administering, setting line or drawing blood from patient (97.8%) followed by washing hands after each contact with patient (95.7%) and keeping safety boxes at close distance (91.3%). The least practiced safety measures were "Avoiding prolonged standing" (65.2%) and "adequate staffing" (60.9%).

Table 3: Safety measures used by health workers of the hospital (N=46)

Safety measures	Frequency	Percentage (%)
Training of staff on safety measures	39	84.8
Provision of personal protective equipment	42	91.3
Use of apron and face mask	41	89.1
Wearing gloves	45	97.8
Washing hands after contact with patient	44	95.7
Never recapping used needles	40	87.0
Disposing sharps and used needles in sharp box	43	93.5
Keeping safety boxes at close distance	44	91.3
Treating materials that come in contact with patient as biohazard	40	87.0
Receiving vaccine	32	69.6
Avoiding prolonged standing	30	65.2
Proper positioning when handling patient/carrying out procedure	34	73.9
Adequate staffing	28	60.9
Documenting and reporting	31	67.4

Table 2: Occupational hazards experienced by the health workers

Occupational Hazards	Frequency	Percentage (%)
Biological hazards		
None experienced	4	8.7
Sharps/needlestick injury	22	47.8
Burns/cuts	7	15.2
Latex allergy	3	6.5
Infection	3	6.5
2 or more experienced	7	15.2
Total	46	100.0
Chemical hazards		
None experienced	17	37.0
Chemical burn	14	30.4
Allergy	14	30.4
2 or more experienced	2	2.2
Total	46	100.0
Psychosocial hazard		
None experienced	2	4.3
Stress	19	41.3
Violence	5	10.9
Verbal/Physical abuse	2	4.3
Sexual abuse	4	8.7
2 or more experienced	14	30.4
Total	46	100.0
Ergonomic hazard		
None experienced	1	2.2
Musculoskeletal injury	12	26.1
Back pain	10	21.7
Body ache	11	23.9
2 or more experienced	12	26.1
Total	46	100.0

3.4. Factors Affecting the Practice of The Safety Measures by The Health Workers

Majority of the respondents 40 (87.0%) do not practice the safety measures effectively mainly because of lack of personal protective equipment followed by forgetfulness (71.7%) and lack of adequate knowledge on safety measures (67.4%).

Table 4: Factors that affect the practice of the safety measures by the health workers (N=46)

Factors	Frequency	Percentage (%)
Forgetfulness	33	71.7
Lack of personal protective equipment	40	87.0
Lack of adequate knowledge on safety measures	31	67.4
Poor timing of work schedule	30	65.2

4. Discussion

This study was carried out among 46 health workers. 6 (13.0%) were doctors, 32 (69.6%) nurses and 8 (17.4%) laboratory scientists. 36 (78.3%) were females while 10 (21.7%) were males. Most of the respondents are married (71.1%) and practice Islam (80.4%). This is probably due to the location of the hospital (Northern Nigeria) where Islam is the predominant religion. The majority of the respondents were nurses which is not surprising as they constitute the largest work force in all health facilities. Also, most of the respondents were aged 20-30 years (58.7%) which is lower than a study by [19] who reported 33 years to be the mean age of the respondents in their study.

Some of the occupational hazards reported by the respondents include: sharp/needle stick injury (47.8%), chemical burn/allergy (30.4%), stress (41.3%), Musculoskeletal injury (26.1%), excess noise (32.6%), electrical shocks (21.7%) and fire out breaks (32.6%). This is similar studies by [20], where the major occupational hazards experienced by the workers included Sharp/needle stick related injuries (21.5%), Musculoskeletal injuries(10.5%),stress (21.5%) among others.

The most experienced occupational hazard by the respondents was sharp/needle stick injury (47.8%) which is slightly higher than 41% that was reported among healthcare workers of a tertiary health institution in Bida by [21]. The rates of occupational hazards were higher among the doctors and the nurses than the laboratory scientists. Most of them reported to have experienced more than two of each type of occupational hazard (15% for biological hazard, 30.4% for psychosocial hazard). This higher rate is most probably due to the fact that doctors and especially nurses are always in contact with the patients unlike the laboratory scientists and also the various procedures they carry out while delivering healthcare services which also exposes them to various blood-borne pathogens and infectious diseases. Furthermore, studies have shown that long working hours increases the risk of exposure to hazards among health workers which is commoner among the nurses and doctors who work longer hours and spend more time with the patients as clinical health workers [2].

Healthcare workers experience exposure to various occupational hazards due to the unique nature of their work. Therefore, the safety measures practiced by the health workers were assessed in this study, that revealed “wearing of gloves for clinical procedures” was the most practiced safety measure (97.8%) followed closely by “washing hands after each contact with patient (95.7%) and disposing sharps and needles in sharp boxes (93.5%). This finding is similar to the finding from a study by [22] where “wearing of gloves for clinical procedures” was the most practiced (96.2%), followed by “deposition of sharps and injection needles in safety boxes “(93.8%). This is a good observation since health workers treat and give their best to their patients while paying little attention to their own health [23]. Practicing proper hand hygiene shows that the health workers take proper measures in ensuring that they reduce the rate of cross transmission on infections.

However, “avoiding prolonged standing” (65.2%) and “adequate staffing”(60.9%) were the least practiced safety measures. This might be due to excess workload on the health workers. Lack of practice of these measures might be the reason for the high rate of stress (41.3%) reported by the respondents. Also the prolonged standing might be a reason for the high rate of musculoskeletal injury (26.1%) and body ache (23.9%) reported by the respondents especially the nurses. This may be because they carry out more procedures in the ward and move patients and equipment around the wards or hospital. A good percentage of the respondents have also received their vaccines (69.6%) which could explain why only 6.5% of the respondents had experienced any infection in the course of their work which is encouraging and shows that there is a positive association between receiving vaccines and control or prevention of infections for the health workers.

The practice of the safety measures by the health workers was affected by some factors mainly Lack of protective equipment (87.0%) and Forgetfulness (71.7%). This is similar to the reports from [24] were 74.0% of the respondents reported unavailability of personal protective equipment as a barrier to compliance of standard precaution. This unavailability needs to be addressed. Health workers need to wear personal protective equipment to protect themselves and their patients from various infectious and also indirectly minimize treatment cost for cross infections because studies have shown that use and compliance with utilization of personal protective equipment is an important control measure in the healthcare industry [25].

5. Conclusion

Healthcare workers continue to face various hazards in their workplaces. These occupational hazards vary depending on the wards or clinic but have negative effects on the health of these workers their families, their patients and the nation at large. Various safety measures can be used to prevent of control these occupational hazards. The findings from this study shows that the health workers experience many occupational hazards, most of the healthcare workers practice safety measures which has led to a decrease in the risk of exposure to these hazards but some safety measures like adequate staffing and avoiding prolonged standing needs to be addressed sand improved upon. Therefore, more rigorous measures need to be put in place to prevent and control exposure to the hazards, also, personal protective equipment should be provided and more staff should be recruited in the hospital.

Recommendation

The results of this study shows that although the health workers practice most of the safety measures, adequate staffing and provision of personal protective equipment are a challenge. It is therefore recommended that, adequate number of staff should be allocated to each ward and clinic to decrease workload and improve productivity. Also, there should be increase in the supply of personal protective equipment supply to the wards and clinics. Furthermore, ncrease in the number of security guards to each ward should be done, so as to reduce the rate of abuse to the health workers. In addition, regulating the number of patient relatives allowed into the hospital ward or around the wards can reduce excess noise and enable the health workers carry out their duties with less distraction. Continuous training of health workers can help in the implementation of standard Operating Principles of the wards and clinics. Lastly, routine education and workshops for the healthcare workers specifically on occupational hazards and Safety measures that they can implement and practice.

Article Information

Disclaimer (Artificial Intelligence): The author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.), and text-to-image generators have been used during writing or editing of manuscripts.

Competing Interests: Authors have declared that no competing interests exist.

References

- [1] N. De Vries, O. Lavreysen, A. Boone, J. Bouman, S. Szemik, K. Baranski, L. Godderis, and P. De Winter. Retaining healthcare workers: A systematic review of strategies for sustaining power in the workplace. *Healthcare*, 11(13):1887, 2023. <https://www.mdpi.com/2227-9032/11/13/1887>.
- [2] R. Rai, S. El-Zaemey, N. Dorji, B. D. Rai, and L. Fritschi. Exposure to occupational hazards among health care workers in low-and middle-income countries: A scoping review. *International Journal of Environmental Research and Public Health*, 18(5):2603, 2021.
- [3] F. J. Afolabi, P. De Beer, and J. A. Haafkens. Occupational risk perception and the use of personal protective equipment (ppe): A study among informal automobile artisans in osun state, nigeria. *Sage Open*, 11(1), 2021. doi:10.1177/2158244021994585. Article 2158244021994585.
- [4] N. A. Sabri, A. R. Sara, M. S. Eslam, and S. M. Amr. A review of occupational hazards in health sector: Risks and awareness. *Medp Public Health Epidemiol*, 1(1), 2022. <http://www.medpresspublications.com/articles/mpphe/mpphe-202208008.pdf>.
- [5] S. Ferracuti, B. Barchielli, C. Napoli, A. M. Giannini, and G. Parmigiani. Managing and preventing acts of violence against health workers: Results of a review evaluating hospital control procedures. *Journal of Aggression, Conflict and Peace Research*, 14(2): 100–111, 2022.

- [6] D. Asumadu, A. Daniel, and S.-B. Solomon. Work-life conflict and health care delivery: Perspectives of healthcare workers in public hospitals in the cape coast metropolis, ghana. *Journal of Social Work in Developing Societies*, 6(1):38–55, 2024.
- [7] K. Khoroush. Guiding improvements to the design of materials for wipe sampling of anti-neoplastic drugs through a statistical analysis of published literature. <https://summit.sfu.ca/item/36064>, 2022.
- [8] I. J. Ilo, C. I. Uchenwoke, U. A. Umeh, U. N. Nwankwo, S. S. Ede, and C. E. Nwankwo. Knowledge and practice of preventive measures for occupational health hazards among nurses working in a teaching hospital in enugu. *Annals of Clinical and Biomedical Research*, 3(1), 2022. <https://africa.pagepress.net/acbr/article/view/182>.
- [9] B. A. Olokede. *Improving the efficacy of occupational safety in Nigeria*. PhD thesis, University of Johannesburg, 2023. <https://ujcontent.uj.ac.za/esploro/outputs/doctoral/Improving-the-efficacy-of-occupational-safety/9939809207691>.
- [10] I. P. Adamopoulos and N. F. Syrou. Workplace safety and occupational health job risks hazards in public health sector in greece. *European Journal of Environment and Public Health*, 6(2), 2022. em0118.
- [11] S. Mokoena. *The Knowledge, Attitude, and Behaviour of Laboratory Workers at the National Health Laboratory Services Towards Health and Safety*. University of Johannesburg (South Africa, 2024. <https://search.proquest.com/openview/65f8e309c7370397c44c0218218c7ada/1?pq-origsite=gscholarcbl=2026366diss=y>.
- [12] P. Tomao, S. Zaffina, R. R. Di Prinzio, N. Vonesch, F. Chirico, and N. Magnavita. The interplay between psychological stressors and biological hazards among healthcare workers during the covid-19 pandemic. *JOURNAL OF HEALTH AND SOCIAL SCIENCES*, 7(4): 368–380, 2022.
- [13] E. C. Koskei. *Factors contributing to occupational injuries and ill health among healthcare workers in selected hospitals in Nairobi City County*. PhD thesis, JKUAT-COHES, 2024. <http://ir.jkuat.ac.ke/handle/123456789/6302>.
- [14] A. Lavafian, P. S. Pezeshki, and N. Rezaei. Investigation of the female infertility risk associated with anti-cancer therapy. *Clinical and Translational Oncology*, 25(7):1893–1905, 2023. doi:10.1007/s12094-023-03087-8.
- [15] O. E. Akinwale and O. J. George. Personnel brain-drain syndrome and quality healthcare delivery among public healthcare workforce in nigeria. *Arab Gulf Journal of Scientific Research*, 41(1):18–39, 2023.
- [16] H. M. Moda, F. M. Dama, C. Nwadike, B. S. Alatni, S. O. Adewoye, H. Sawyerr, P. J. S. Doka, and M. Danjin. Assessment of workplace safety climate among healthcare workers during the covid-19 pandemic in low and middle income countries: A case study of nigeria. *healthcare (basel)*. 2021, 9(6), 2021.
- [17] M. M. Abiona and S. Asaolu. Occupational hazards among health care workers in nigeria. *African Journal of Biomedical Research*, 26(3), 2023.
- [18] A. Setiyadi, L. Levyda, K. Sulistyadi, and T. Sukwika. Knowledge and perception of nurses about occupational hazard with nurse characteristics. *Journal for Quality in Public Health*, 5(2):586–592, 2022.
- [19] K. A. Durowade, O. E. Elegbede, G. B. Pius-Imue, A. Omeiza, M. Bello, C. Mark-Uchendu, A. Adedipe, O. Aluko, O. Adeyeye, and O. M. Akinola. Substance use: Prevalence, pattern and risk factors among undergraduate students in a tertiary institution in southwest nigeria. *Journal of Community Medicine and Primary Health Care*, 33(2):83–99, 2021.
- [20] K. S. Gentle, R. Oyibo, B. P. James, T. Amaigbani, and E. N. Etor. Occupational hazards and compliance with safety practices among correctional service officers in delta state. <https://www.seahipublications.org/wp-content/uploads/2024/10/IJISSER-D-6-2024.pdf>, 2024.
- [21] H. U. Okemmiri, Jibrin Abdullahi Yafu A. Y., and U. Abdullahi. Application of queuing theory to optimize waiting-time in hospital operations. <http://irepo.futminna.edu.ng:8080/jspui/handle/123456789/29797>, 2024.
- [22] E. B. Jonah and T. Dahiru. Knowledge and practice of occupational health hazard among healthcare workers in kogi state specialist hospital. *Saudi J Nurs Health Care*, 7(3):60–68, 2024.
- [23] S. L. Harcourt and J. E. Raphael. Prevalence of low back pain among specialist medical consultants at the university of port harcourt teaching hospital, port harcourt, rivers state. *Nigerian Medical Journal: Journal of the Nigeria Medical Association*, 64(3):408, 2023.
- [24] S. Alhumaid, A. Al Mutair, Z. Al Alawi, M. Alsuliman, G. Y. Ahmed, A. A. Rabaan, J. A. Al-Tawfiq, and A. Al-Omari. Knowledge of infection prevention and control among healthcare workers and factors influencing compliance: A systematic review. *Antimicrobial Resistance Infection Control*, 10(1):86, 2021. doi:10.1186/s13756-021-00957-0.
- [25] D. K. Elhassan. Knowledge, attitudes and practices of oral health care workers towards infection control in khartoum dental teaching hospital, sudan. <https://uwcscholar.uwc.ac.za/items/ed238033-4edf-4dd4-9c3f-066379824285>, 2023.