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Assessment of Occupational Health Safety and Hazard among Government Health Workers in Ondo City, Southwest Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Authors BWO and OAA designed the study, formulated the questionnaire and wrote the first draft of the manuscript. Authors AAA and AAA managed the literature searches and the recruitment of respondents. Administration of questionnaires was coordinated by authors BWO, OAA, AAA and AAA. Data analyses were carried out by author BWO. All authors read and approved the final manuscript.

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ABSTRACT

Aim: To assess the level of awareness of occupational health safety (OHS), to identify common occupational hazards and to determine the association between profession, year of experience and level of awareness of occupational health hazards among government Health Care Workers (HCWs) in Ondo city, Southwest Nigeria.
Study Design: A descriptive cross-sectional study carried out over a 6 week period between September to October 2015.
Place and Duration of Study: The Two Government Hospitals in Ondo (University of Medical Science Teaching Hospital and State Specialist Hospital Ondo).
Methodology: A Standard questionnaire that has both risk assessment and safety practices

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sections was administered to HCWs in the hospitals which were categorised into clinical and non-clinical professionals. Data obtained were analysed using SPSS version 17.
Results: A total of 345 respondents participated in the study comprising of 136 (39.4%) males and 209 (60.4%) females. About 85% of the respondents were aware of OHS and undergraduate training was the major source of awareness in 177 (51.3%). The common hazards identified among the respondents were sharp related injuries in 280(75.4%), infections from patients in 244(70.7%), cuts and wounds in 207(60%), air borne disease in 207(60%) and stress in 268(77.7%), physical/verbal abuses in 184(53.3%). One hundred and thirty one (38%) respondents had high level of occupational risk while only 21(6.1%) had good level of safety measures. Non-clinical HCWs had significantly better safety practices (P <0 .001). Clinical HCWs were significantly more aware of OHS (P < 0.001). Also, HCWs with > 10 years of practice had better awareness of OHS (P =0 .01).
Conclusion: Majority of the government HCWs in Ondo had high occupational hazard risk, poor compliance to occupational safety measures despite high awareness of OHS.

Keywords: Occupational health safety; healthcare-workers; hazard; awareness.

1. INTRODUCTION

Healthcare workforce is one of the largest work forces in the world constituting over 12% of the working population in the whole world [1]. Nigeria has one of the largest pools of healthcare personnel in Africa [2] and they make up about one third of the total workforce in Nigeria. Health workers perform their duties in an increasing hazardous work environment and occupational settings [3,4]. Personnel in this workforce are responsible for providing quality health care services, even though their work places (hospitals, clinics and laboratories) are increasingly unsafe [5].

It was reported that healthcare workers (HCWs) encounter different hazards due to their activities [6,7]. This includes but not limited to sharp related injuries, direct infections, stress, assault from patients and their relatives, allergies, back pain, and other musculoskeletal injuries [1,8,9]. In spite of the numerous hazards in their unsafe workplaces, healthcare occupational settings continue to be neglected by governments, management and regulators [10].

Occupational health hazards put HCWs at risk of increased morbidity and mortality. Loss of skilled health personnel will adversely affect healthcare services which are already suboptimal in developing countries such as Nigeria. The multiplying effects of occupational injuries and diseases among health workers include economic loss, physical loss and psychological disorders such as stress and depression. These have an overall negative impact on the workers, their families and the nation at large.

Identifying factors relating to occupational hazards among HCWs is essential in formulating occupational health safety policy and system that will improve the productivity and overall wellbeing of HCWs. This study assessed the level of awareness of occupational health safety, identified common hazards among health workers and determined association between profession, year of experience and level of awareness of occupational health hazards among these health workers in two government hospitals in Ondo, South west Nigeria.

2. METHODOLOGY

This was a descriptive cross-sectional study that was carried out over a 6 week period between September to October 2015. The sampling location covered the two government hospitals in Ondo (University of Medical Science Teaching Hospital, Ondo and State Specialist Hospital Ondo) situated in Ondo State, South West of Nigeria. The University of Medical Science Teaching hospital is a newly established hospital that is about 4 year old while the State specialist hospital was established over five decades ago. Ethical approval was obtained from the hospitals' Ethics Committee on research, and consents were obtained from respondents.

The study population included health workers in the hospitals who were doctors, nurses, pharmacists, laboratory scientists, engineers, physiotherapists, health record officers, health attendants, and cleaners. The professions were categorised into clinical (doctors, nurses, pharmacist, laboratory scientist and health assistants) and non-clinical (cleaners, engineers, health information workers, physiotherapist) professions depending on their duties in the hospital. A minimum sample size of 263 was calculated using the formulae [11]:

$n=Z_{1-\alpha/2}^2\ p.(1-p)/d^2$

Where:

n = the minimum sample size,
$Z_{1-\alpha/2}$ = standard normal variate (at 5% type 1 error (P<0.05) i.e 1.96,
p = expected Proportion in population based on previous study. (A previous report of an average of 76% awareness of Occupational health hazard was used) [12],
d = absolute error or precision (0.05).

A total of 400 questionnaires were distributed in both hospitals with 345 completely filled and returned which gave a response rate of 86.3%.

A standardized structured questionnaire adopted from the National Institute of Occupational Safety and Health, US Centre for Disease Control and Prevention [13], and modified to suit the objectives of this research was used for data collection. The questionnaire consisted of questions regarding socio-demographic characteristics which included age, gender, marital status, profession, and their work history. In addition, questions about awareness of occupational health and safety, source of awareness, common hazards, personal risk assessment, and the safety practices to mitigate those hazards.

The questionnaires were administered by research assistants who were well trained on questionnaire administration. A scoring system was adopted for the two major sections of the questionnaire. The highest score of 40 and the lowest score of 10 were obtainable in the risk assessment section of the questionnaire in which scores ≥ 20, 21-30 and > 30 were considered as low, moderate and high risk, respectively. The lowest and highest scores obtainable in the safety practices assessment section were 9 and 27, respectively, whereas scores of 21-27, 14-20 and ≥ 13 were considered as poor, moderate and good safety practices respectively.

2.1 Data Analyses

Data obtained were entered and subjected to descriptive and inferential statistics using Statistical Package for Social Sciences version 17.0 (Chicago Inc.,). Frequency (percentage) of variables and association between variables were established. Univariate analysis was used in obtaining the frequency of socio - demographic characteristics and other discrete variables of the study population. Chi-square test was used to determine the significance of the observed differences for categorical variables while chi-square with trend was used where the categorical variable was ordinal. P value of <0 .05 was considered as significant.

3. RESULTS

A total of 345 respondents participated in the study comprising of 136 (39.4%) males and 209 (60.4%) females. Majority of the respondents were 40 years and below accounting for 286 (82.9%) of all the respondents. One hundred and ninety-six (56.8%) were married while 145(42.0%) were single. Two-hundred and eighty-two (81.7%) had ten years and below of practice experience. Amongst the respondents, 95(27.5%) were nurses, 67(19.4%) were doctors, 46 (13.3%) were laboratory scientists, 26 (7.5%) were pharmacists, 31 (9.0%) were cleaners, 15 (4.3%) were health attendants. Two hundred and ninety-two (84.6%) were aware of occupational health safety (Table 1).

Table 1. Socio-Demographics characteristics of health workers

Parameter (N = 345)	Frequency (%)
Gender:	
Male	136 (39.4%)
Female	209 (60.4%)
Age:	
≤ 40 years	286 (82.9%)
> 40 years	56 (17.1%)
Marital status:	
Single	145 (42.0)
Married	196 (56.8%)
Divorced	3 (0.9%)
Widowed	1 (0.3%)
Years of practice:	
≤ 10	282 (81.7%)
> 10	63 (18.3%)
Profession:	
Doctor	67 (19.4%)
Nurse	95 (27.5%)
Laboratory scientist	46 (13.3%)
Pharmacist	26 (7.5%)
Engineer	12 (3.5%)
Cleaner	31 (9.0%)
Health attendants	15 (4.3%)
Health record officers	28 (8.1%)
Others	25 (7.2%)
Awareness of OHS:	
No	53 (15.4%)
Yes	292 (84.6%)

OHS: Occupational Health Safety

The common sources of awareness were during undergraduate training (51.3%) and seminar /workshop (22.9%) (Fig. 1).

The most common biological and non-biological hazards identified among the respondents were sharp related injuries in 75.4% and stress in 77.7% while the least common were blood borne infections in 48.1% and exposure to radiation in 26.1% respectively (Table 2).

Amongst the respondents, 131(38%),192 (55.7%),22 (6.4%) had high, moderate and low level of occupational health hazard risk respectively (Fig. 2). Also, 21(6.1%), 100 (26.7) and 231(67.2%) of the respondents had good, moderate and poor level of safety measures respectively.

There was no significant association between profession, year of experience, awareness of occupational health safety and level of personal risk assessment among the respondents (Table 3).

Non-clinical health workers had significantly better use of safety measures compared to clinical health workers (P < .001) (Table 4).

Clinical health workers were significantly more aware of OHS compared to non-clinical health workers (P < .001). Also, those with more than 10 years of practice experience were significantly more aware of OHS (P = 0.01) (Table 5).

4. DISCUSSION

The study showed that majority of the government health workers in Ondo had high occupational hazard risk, poor compliance to occupational safety measures despite high awareness of OHS.

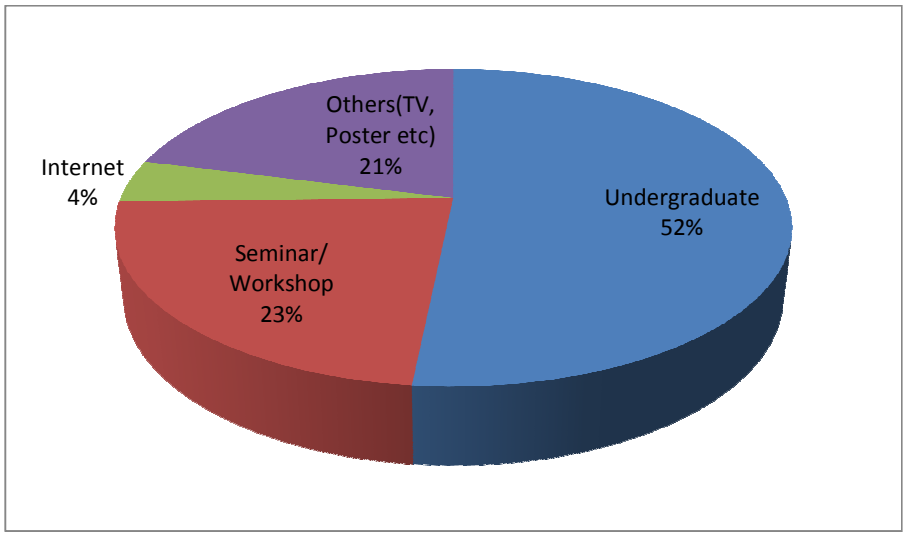

Fig. 1. Sources of occupational health and safety awareness among health workers

Table 2. Frequency of common hazards

Type of hazard	Common hazards	Frequency yes (%)
Biological hazards	Sharp related injuries	280 (75.4%)
	Infection from patients	244 (70.7%)
	Cuts and wound	207 (60%)
	Airborne disease	207 (60%)
	Direct contact with contaminated specimen	202 (58.6%)
	Others (Blood borne pathogens)	166 (48.1%)
Non-Biological Hazards	Stress	268 (77.7%)
	Physical and verbal abuse	184 (53.3%)
	Slips, trips and falls	131 (38%)
	Allergy	122 (35.4%)
	Chemical spill	101 (29.3%)
	Exposure to radiation	90 (26.1%)

Table 3. Association between profession, year of experience and personal risk assessment among health workers

Parameter	Risk assessment			Chi-square for linear trend	P value
	Low risk	Moderate risk	High risk		
Profession:					
Clinical	16 (5.9%)	155 (57.6%)	98 (36.4%)	0.596	0.44
Non-Clinical	6 (7.9%)	37 (48.7%)	33 (43.4%)		
Year of experience:					
≤10 yrs	17 (6.0%)	155 (55.0%)	110 (39.0%)	0.653	0.42
>10 yrs	5 (7.9%)	37 (58.7%)	21 (33.3%)		

OHS: Occupational Health and Safety

Table 4. Association between profession, year of experience and occupational safety measures among health workers in Ondo

Parameter	Occupational safety measures			Chi-square for linear trend	P value
	Poor	Moderate	Good		
Profession:					
Clinical	195 (72.5%)	59 (21.9%)	15 (5.6%)	11.96	<0.001
Non-clinical	37 (48.7%)	33 (43.4%)	6 (7.9%)		
Year of experience:					
≤10 yrs	187 (66.3%)	79 (28.0%)	16 (5.7%)	0.05	0.82
>10 yrs	45 (71.4%)	13 (20.6%)	5 (7.9%)		

OHS: Occupational Health and Safety

Table 5. Association between awareness of OHS, profession and year of experience among health workers

Parameter	Awareness of OHS		Chi-square	P value
	No	Yes		
Profession:				
Clinical	19 (7.1%)	250 (92.9%)	64.685	<0.001
Non-Clinical	34 (44.7%)	42 (55.3%)		
Year of experience:				
≤10 yrs	50 (17.7%)	232 (82.3%)	6.661	0.010
>10 yrs	3 (4.8%)	60 (95.2%)		

OHS: Occupational Health and Safety

The majority of the respondents were nurses and doctors which is not surprising as they constitute the largest workforce in all health facilities. Also, most of the respondents were 40 years and below similar to reports by Amosu et al. [14]. This may be due to the fact that one of the two hospitals selected in this study was newly established and had relatively young work force in terms of age and year of practice experience.

The high level of awareness of OHS among health workers in this study is similar to the previous Indian study conducted by Manuel et al. [12]. However, It is different from studies done by Manyele et al. and Awoyemi and Kabir who reported a low level of awareness among health workers [6,15]. The high awareness among the respondents in this study might be due to the fact that there were more clinical health workers compared to the non-clinical health workers. The former are usually exposed to OHS during the course of their undergraduate training.

Undergraduate training was the major source of awareness of OHS in this study which is not surprising because OHS is part of undergraduate curriculum for most clinical disciplines in Nigeria. However, this also showed that awareness of OHS could be promoted through other means especially mass media which has not been well explored in the past as seen in this study.

Sharp related injuries, infections from patients, cuts, wound, stress, physical and verbal abuse were common biological and non-biological hazards encountered by health workers in the

study which is largely corroborated by previous studies [6,13,16].

Majority of health workers in this study had moderate to high risk of occupational hazards which further confirmed that HCWs are exposed to a very wide variety of risks and that they operate in an environment that is considered to be one of the most hazardous occupational settings [2,3,6,17].

There was no significant association between the level of occupational risk among HCWs and profession. However, clinical health workers were more exposed and moderate to high risk compared to non-clinical health workers. This might be explained by the facts that most hazardous activities carried out by clinical workers compared to non-clinical workers. Furthermore, studies have shown that long working hour increases the risk of hazards among health workers which is commoner with clinical health workers [18,19].

There was no significant association between the level of risk of health workers and year of experience. This may be due to the fact that all health workers regardless of their year of experience are exposed to similar degree of risk in the course of discharging their professional duties.

There was a significant association between type of profession (clinical vs non-clinical) and practice of safety measures among the respondents. Surprisingly, clinical health workers had poorer safety practices compared to non-clinical health workers which is inconsistent with findings of Orji et al. [16]. However, this may be due to increase pressure of work experienced by clinical workers compared to non-clinical workers. This tends to agree with Caillard's study which reported that doctors and nurses render selfless services to their patients at the expense of their safety and health [20]. Also, experienced clinical workers (Doctors and Nurses) have sensation of safety and do not give necessary attention to safety measures increasing their vulnerability and risk to hazards.

The year of experience had no significant association with the safety practices of workers in this study. This was similar to findings of Iliayasu et al. [21]. This could be because health workers in hospitals use similar safety equipments provided by the hospital authorities irrespective of their year of experience.

About 70% of the respondents had poor practice of safety measures despite the fact that there was high awareness of OHS. This was similar to previous studies that involved both health and non-health workers [22,23]. This showed that high awareness of OHS did not translate into better safety practices. This may be due to workload of the health care workers, lack of a functional, active occupational safety policy system and lack of safety officers to supervise and monitor health workers on safety practices. This also reiterates the need for regular in-service retraining for health workers on OHS.

It was also established that profession and number of years of experience had significant association with the level of awareness of OHS among health care workers. Clinical health workers had better awareness of OHS than non-clinical workers even though they had poorer safety practices compared to non-clinical health workers. This may be due to the fact these clinical health have OHS integrated in their undergraduate training. Also, they are likely to be more educated and informed than the non-clinical HCWs such as cleaners.

The limitation of the study was that workload and specialty of the clinical HCWs which might have association with their occupational health hazard risk were not assessed in this study.

5. CONCLUSION

This study showed that majority of the government health workers in Ondo had high occupational hazard risk, poor compliance to occupational safety measures despite high awareness of OHS. Clinical health workers and health workers with more than 10 years experience had better awareness of OHS.

6. RECOMMENDATIONS

There should be regular in-service training for health workers on OHS. Hospitals should establish functional and active occupational safety policy systems that will be supervised by OHS officers. These will improve productivity and overall well-being of health workers in Nigeria.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Goniewicz M, Włoszczak-Szubzda A, Niemcewicz M, Witt M, Marciniak-Niemcewicz A, Jarosz MJ. Injuries caused by sharp instruments among healthcare workers international and Polish perspectives. Annals of Agricultural and Environmental Medicine. 2012;19(3):523–527.
2. WHO. Global health workforce alliance: Nigeria. World Health Organizaion; 2015. Available:http://www.who.int/workforcealliance/countries/nga/en/ (Accessed on 19th November, 2015)
3. Moore Jr RM, Kaczmarek RG. Occupational hazards to health care workers: Diverse, ill-defined and not fully appreciated. American Journal of Infection Control. 1990;18(5):316–327.
4. Triolo PK. Occupational health hazards of hospital staff nurses. Part II: Physical, chemical and biological stressors. AAOHN Journal. 1989;37(7):274–279.
5. Stonerock T. Professional Burnout. Recent Developments in Theory and Research, London and New York; 2004.
6. Manyele SV, Ngonyani HAM, Eliakimu E. The status of occupational safety among health service providers in hospitals in Tanzania. Tanzania Journal of Health Research. 2008;10(3):159-165.
7. Nsubuga FM, Jaakkola MS, Needle stick injuries among nurses in sub-Saharan Africa. Tropical Medicine and International Health. 2005;10(8):773-781.
8. Ndejjo R, Musinguzi G, Yu X, Buregyeya E, Musoke D, Wang JS, Halage AA, Whalen C, Bazeyo W, Williams P, Ssempebwa J. Occupational health hazards among healthcare workers in Kampala, Uganda. J Environ Public Health. 2015;2015:913741. DOI: 10.1155/2015/913741
9. Andersen LL, Clausen T, Mortensen OS, Burr H, Holtermann A. A prospective cohort study on musculoskeletal risk factors for long-term sickness absence among healthcare workers in eldercare. International Archives of Occupational and Environmental Health. 2012;85(6):615–622.
10. Lipscomb J, Rosenstock L. Healthcare workers: Protecting those who protect our health. Infection Control and Hospital Epidemiology. 1997;18(6):397–399.
11. Charan J, Biswas T. How to calculate sample size for different study designs in medical research. Indian J Psychol Med. 2013;35(10):121–126.
12. Manuel M, Daphnie L, D'cunha S, Suresh S. A study to assess the awareness regarding occupational health hazards among the employees in the laundry department of a selected hospital. Muller J Med Sci Res. 2015;6:40-4.
13. National Institute of Occupational Safety and Health, US Centre for Disease Control and Prevention. 2014;3:17. Available:http://www.cdc.gov/mmwr/mmwrsrch.htm (Accessed 12th August, 2015)
14. Amosu AM, Degun AM, Atulomah NOS, Olanrewju MF, Aderibigbe KA. the level of knowledge regarding occupational hazards among nurses in Abeokuta, Ogun State, Nigeria. Current Research Journal of Biological Sciences. 2011;3(6):586-590.
15. Awoyemi AO, Kabir M. Awareness about occupational hazards among doctors at a hospital in Nigeria. Bioscience Research Communications. 1997;9(3):183–187.
16. Orji EO, Fasubaa OB, Onwudiegwu U, Dare FO, Ogunniyi SO. Occupational health hazards among health care workers in an obstetrics and gynaecology unit of a Nigerian teaching hospital. Journal of Obstetrics & Gynaecology. 2002;22(1):75-78.
17. National Institute for occupational safety and health (NIOSH), division of respiratory disease studies. Centre for disease control and prevention. 2014;12:12. Available:www.cdc.gov/niosh/topics/healthcare/. (Accessed 24 November 2015)
18. Lipscomb JA, Trinkoff AM, Geiger-Brown J, Brady B. Work-schedule characteristics and reported musculoskeletal disorders of registered nurses. Scandinavian Journal of Work, Environment and Health. 2002; 28(6):394-401.
19. Kirkcaldy BD, Trimpop R, Cooper CL. Working hours, job stress, work satisfaction and accident rates among medical practitioners and allied personnel. International Journal of Stress Management. 1997;4(2):79-87.
20. Caillard JF. General aspects of occupational health for healthcare workers. African Newsletter on Occupational Health and Safety. Proceedings of PACIH'92, 1993;3:78–85.

21. Iliyasu G, Dayyab FM, Habib ZG, Tiamiyu AB, Abubakar S, Mijinyawa MS, et al. Knowledge and practice of infection contrl among health workers in a tertiary center in North-West Nigeria. Ann Afr Med. 2015;1.
DOI:10.4103/1596-3519.161724
22. Ogunnowo BE, Anunobi CC, Onajole AT, Odeyemi KA. Awareness of occupational health hazards and the practice of universal safety precautions among mortuary workers in South West Nigeria. Nig Q J Hosp Med. 2010;20(4):192-6.
23. Ahmed HO, Newson-Smith MS. Knowledge and practices related to occupational hazards among cement workers in United Arab Emirates. J Egypt Public Health Assoc. 2010;85(3-4):149-67.

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