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Assessment of the Knowledge of Occupational Hazards and Control Measures among Healthcare Workers of the General Hospital, Minna

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Authors' contributions

This work was carried out in collaboration between all authors. Author ABE designed the study, wrote the protocol. Author IMS wrote the first draft of the manuscript and performed the statistical analysis. Authors ABE and JJO managed the analyses of the study. Author JJO managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

This study focused on the assessment of knowledge of occupational hazards and its control measures among healthcare workers of the General Hospital, Minna. The study was Cross-Sectional Descriptive. The population of the study included all permanent staffs working for at least 6 months. In this study, 300 sample size was used. Stratified Sampling Technique was adopted for allocating questionnaires. Data obtained were analyzed using SPSS. The finding indicates that Healthcare workers of the General Hospital have a low level of knowledge on occupational hazards and its control due to non-exposure to training on occupational hazards, and this may constitute a danger to their health. The study concludes that less than 1/10th of the respondents were exposed to fluid from HIV/AIDS patients and that high number received Post Exposure Prophylaxis (PEP).

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This study, therefore, recommends that Health Education should be strengthened to enhance knowledge of health workers on the use of PPE and that Health workers should attend training on occupational hazards and control measures at the hospital.

Keywords: Occupational hazard; control measures; occupational illness; needle stick injuries; post exposure prophylaxis; hepatitis B vaccine.

1. INTRODUCTION

It is no doubt that occupations have a close association with different hazards. According to the study in Benin, at least 50 million Nigerians are at risk of occupational hazards [1]. Specifically, the healthcare organisations in Nigeria have stock of workers who are more likely to be exposed to hazards from their various jobs. Occupational health is a neglected public health issue among healthcare workers in developing countries, and this has exposed them to various forms of hazards which have had negative consequences on their well-being and performance at work.[2] This study is about healthcare occupation, and this dichotomizes the workers into two categories- those that deals with patients directly or their secretions or blood and those that do more of paperwork. Healthcare workers deal with a wide range of activities that pose a threat or risk to their health.[3] These include physical, chemical, biological, ergonomic and psychosocial risk.[3] The most common physical hazards are ionising radiation from X-rays, most common chemical hazard is from anti-cancer drugs exposed through contact or inhalation. Ergonomic hazard include physical work affecting joints and muscle, while the psychosocial hazard is as a result of man to man interaction.[3]

World Health Organization states that the global burden of disease from acute injuries showed that 37% of the hepatitis B among health workers was as a result of occupational exposure. Less than 10% of HIV among health workers is the result of exposure at work, and needlestick injuries are the cause of 95% of the HIV occupational sero conversion.[4] Non-fatal occupational injury and illness among healthcare workers are the highest of any industrial sector.[5] Not less than 200 cases of industrial accidents occur in the workplaces in Nigeria daily with an equally high rate of fatalities.[6] High level of occupational hazard is relative to the lack of adequate laws and policies regulating the work environment.[2] By contrast two of the most hazardous industries- agriculture and construction are safer today than they were a decade ago.[5]

However, the healthcare workers of General Hospital Minna need protection from these hazards. Since the healthcare workers are expected to sacrifice their wellbeing for the sake of their patients [4], protecting them becomes highly imperative, as it is significant in the delivery of quality health services to the generality of population.[4] In a study that determined the prevalence of hepatitis B surface antigen in surgeon in Lagos [7], it was found to be 25.7% compared to 15% in the control group. The frequency of antibody to the surface antigen was 22.2% among the surgeon and 4.1% in the control group. That of the core antigen was 61.7% in surgeon as compared to 53.4% in control. This result shows a wide gap between occupational hazard occurrence and its control in Nigeria. This appears to be in close association with the knowledge of occupational hazard and how it can be probably controlled. It is observed that inadequate or ineffective control practice may result into increased turnover rate among health workers of the General Hospital Minna. Some of the health workers may decide to relinquish their work and enter into another sector simply because of hazard such as Ebola virus disease. In a situation where there is dearth of medical personnel in the hospital, this study will inform the policy maker to put in place safety measure in the hospital for healthcare workers.

2. METHODOLOGY

General Hospital Minna is one of the secondary health facility established in 1926. It is located along old secretariat road around David Mark square. It has a 300-bed capacity. It offers both primary and secondary healthcare services. It has a staff strength of 805 as shown Table 1.

The population of the study included all permanent staffs working for at least 6 months. The study was Cross-Sectional Descriptive. The minimum sample size for the study was determined using fischer's formula [8] for population less than 10,000

$$n = \frac{z^2 pq}{d^2}$$

n= minimum sample size when population >10,000
z= Standard normal deviate corresponding to 95% CI given as 1.96
p= 63.8%% proportion of those who always used Personal Protective Equipment.[9]
q= 1 – p (proportion of those who refused to always use Personal Protective Equipment.
d= degree of accuracy

$$n=\frac{(1.96)^2\ x\ 0.638\,x\,0.362}{(0.05)^2}$$

=355

Since the population of the health workers of General hospital, minna is < 10,000

$$nf=\frac{n}{1+\frac{n}{N}}$$

Where nf is the desire sample size when a population is less than 10,000

N = desired sample size when the population is greater than 10,000
N = Population of health workers of General Hospital Minna (Target population)

$$=\frac{355}{1+\frac{355}{774}}$$

= 243

For non response = $\frac{243}{0.9}$

= 270

Table 1. Population Frame

Professional category	Numbers
Medical doctors	53
Nurses	471
Pharmacist	32
Laboratory scientist/technician	64
Dentist	10
Radiographers	6
Medical records	60
Sanitation workers	26
Security	31
Drivers	7
Accountant	28
Mortuary attendants	2
Administrative staff	3
Total	805

Field Survey, 2017

For this study 300 sample size was used. The two criteria adopted are both inclusion and exclusion. For inclusion criteria, all health workers of General Hospital Minna that are directly in contact with patient, blood and secretions selected. Exclusion Criteria, the following were excluded from the study:

i. Respondents acutely or chronically ill
ii. Respondents that were temporary or contract staffs
iii. Respondents that were less than 6 months in the service
iv. Respondents who travelled during the period of the research
v. Administrative staffs

Stratified Sampling Technique (proportional allocation) was adopted for allocating questionnaires as shown

$$\frac{No\ of\ staffs\ in\ each\ profession}{Total\ number\ of\ staff}\,x\,300$$

Table 2. Administration of Questionnaire

Professionals	Number	No of allocated questionnaire
Clinician	63	21
Nurses	471	190
Pharmacist	32	13
Laboratory Scientist/ Technicians	64	26
Physiotherapy	2	
Radiographers	6	1
Sanitation workers	26	8
Mortuary attendants	2	1
Drivers	7	3
Security	31	11
Medical records	60	23
Total	**774**	**300**

Field Survey, 2017

In each profession, sampling frame was formed. This was divided by the allocated sample size to determine sampling interval. First respondent was chosen through random sampling technique by balloting. Subsequently, respondent was obtained by adding the sampling interval continuously until the final respondent was chosen. The respondents were administered with semi-structured self-administered questionnaire.

Data was collected by the researcher and edited manually to detect omission and to ensure

uniform coding after which it was entered into the computer. Data analysis was done using SPSS.

3. RESULTS

Three hundred (300) questionnaires were distributed and 250 were returned and analyzed.

Table 3 shows that majority of the respondents (85.6%) knew that Hepatitis B Vaccine could be given prior or during the work period. Nine point two percent (9.2%) do not know while 5.2% are indifferent

Table 3. Respondents' knowledge of receipt of hepatitis B vaccine

Hepatitis B vaccine prior or during work	Frequency (%)
Yes	214 (85.6)
No	23 (9.2)
Indifferent	13 (5.2)

Field Survey, 2017

Table 4 shows that less than half of the respondents (40.0%) expressed that the proper time to start Post Exposure Prophylaxis against HIV is in 2 hours, while 35.6% of the respondents expressed 72 hours. About 17.2% of the respondents expressed that it can be started in 24 hours.

Table 4. Respondents knowledge of proper time to start post exposure prophylaxis

Proper time to start PEP on HIV	Frequency (%)
2hours	100(40)
6hours	11(4.4)
24hours	43(17.2)
72hours	89(35.6)
90hours	7(2.8)

Field Survey, 2017

Table 5 shows that majority of the respondents (38.4%) wrongly expressed that the duration of Post Exposure Prophylaxis against HIV is 6 months, while 36.8% of the respondents expressed that it is 4 weeks. About 15.6% of the respondents expressed that it is given for life.

Fig. 1 shows that majority of the respondents (55.2%) have poor knowledge of the occupational hazards of the health workers while 18.4% of the respondents have good knowledge.

Table 6A shows that among the respondents who had poor knowledge of the occupational hazards and its control among healthcare workers, female constituted 55.6% while male 54.3%. Among the respondents who had good knowledge, male constituted 30.9% while female 12.4%. There was statically significant association between gender and level of knowledge of occupational hazards and control among healthcare workers, P<0.001.

Table 5. Respondents' knowledge of duration of post exposure prophylaxis

Appropriate duration of post exposure prophylaxis on HIV	Frequency (%)
For life	39(15.6)
Four weeks	92(36.8)
Once	23(9.2)
Six months	96(38.4)

Field Survey, 2017

Table 6A also shows that among the respondents who had poor knowledge, uneducated respondents constituted 100%, followed by the respondents with secondary level of Education (71.4%), the least was respondents with primary level of Education (33.4%). Among the respondents with Good knowledge, the respondents with Primary level of education constituted 33.4%, while respondents with Post-Graduate level of education constituted 27.3%. There was statistical significant association between knowledge of occupational hazards and level of Education, P=0.049.

Table 6B shows that among the respondents who had poor knowledge of occupational hazards and control, majority of them are workers; others (66.7%) excluding laboratory staff (60.0%), Nursing (59.2%), Pharmacy and clinician (25.0%). Among the respondents that had Good knowledge, majority are clinician (54.2%); others staff (33.3%) excluding laboratory staff (18.5%) and Pharmacy (12.5%). There was statistical significant association between professional lineage and knowledge of occupational hazards and control among healthcare workers, P<0.001.

Table 6B also shows that among respondents who had poor knowledge of occupational hazards and control, the respondents working in the Laboratory 63.2% are the majority. Others include respondents in the Wards 59.8%, Clinic 51.8% and Pharmacy 14.3%. Among the respondents who had Good knowledge, majority are respondents working in the pharmacy 57.1%, other include clinic 25.9%, laboratory 13.2% and

Wards 8.7%. There is statistical association between point of service and knowledge, P=0.005.

Table 7A shows that majority of the respondents expressed that they will seek for safety measure if they are accidentally exposed to Needle Stick injuries from an infected patients. About 8.0% expressed that they will do nothing until symptoms started appearing.

Table 7B shows that majority of the respondents (75.6%) expressed that Needle Prick is enough to cause HIV. More than half of the respondents (90.8%) claimed decontamination and sterilization is necessary precautionary measures. About 65.6% of the respondents claimed recapping of Needle after use is not good. More than half of the respondents (57.6%) expressed that HIV Post Exposure Prophylaxis can reduce the likelihood of HIV

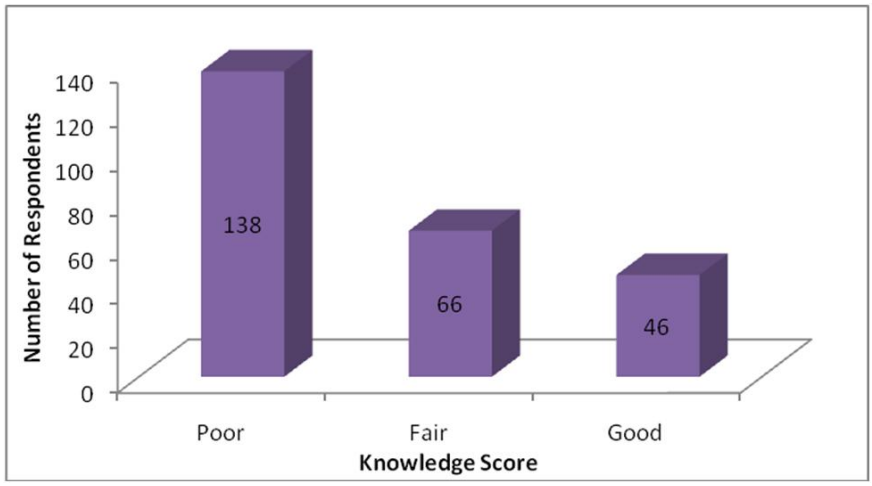

Fig. 1. Knowledge score of respondents

Table 6A. Association between socio demographic characteristics & knowledge grading

Variable	Knowledge score			χ^2	P
	Poor (%)	Fair (%)	Good (%)		
Age groups					
≤ 27	21 (61.8)	9 (26.5)	4 (11.8)		
28 – 37	44 (62.9)	15 (21.4)	11 (15.7)		
38 – 47	43 (51.2)	21 (25.0)	20 (23.8)		
48 – 57	29 (48.3)	20 (33.3)	11 (18.3)		
≥ 58	1 (50.0)	1 (50.0)	0 (0.0)	6.800	0.558
Gender					
Male	44 (54.3)	12 (4.8)	25 (30.9)		
Female	94 (55.6)	54 (32.0)	21 (12.4)	16.225	**< 0.001**
Marital status					
Single	27 (49.1)	14 (25.5)	14 (25.5)		
Married	109 (57.7)	50 (26.5)	30 (15.9)		
Widowed	2 (33.3)	2 (33.3)	3 (33.4)	4.100	0.393
Family type					
Monogamy	87 (54.0)	42 (26.1)	32 (19.9)		
Polygamy	51 (57.3)	24 (27.0)	14 (15.7)	0.663	0.718
Level of education					
Uneducated	1 (100.0)	0 (0.0)	0 (0.0)		
Primary	1 (33.3)	1 (33.3)	1 (33.4)		
Secondary	10 (71.4)	2 (14.3)	2 (14.3)		
Tertiary	72 (54.1)	45 (33.8)	16 (12.0)		
Post graduate	54 (54.5)	18 (18.2)	27 (27.3)	15.586	**0.049**

Field Survey, 2017

Table 6B. Association between socio demographic characteristics and knowledge score

Variables	Knowledge score			P	χ^2
	Poor	Fair	Good		
Professional Lineage					
Clinical	6 (25.0)	5 (20.8)	13 (54.2)		
Pharmacy	2 (25.0)	5 (62.5)	1 (12.5)		
Nursing	87 (59.2)	42 (28.6)	18 (12.2)		
Laboratory	39 (60.0)	14 (21.5)	12 (18.5)		
Others	4 (66.7)	0 (0.0)	2 (33.3)	33.375	**< 0.001**
Point of Service					
Clinic	58 (51.8)	25 (22.3)	29 (25.9)		
Wards	55 (59.8)	29 (31.5)	8 (8.7)		
Lab	24 (63.2)	9 (23.7)	5 (13.2)		
Pharmacy	1 (14.3)	2 (28.6)	4 (57.1)		
Others	0 (0.0)	1 (100.0)	0 (0.0)	22.076	**0.005**

Field Survey, 2017

infection. Majority of the respondents (94.8%) expressed that safety measures should be enforced in the hospital and 94.0% expressed that they can go for Periodic Medical Examination.

Table 7C shows that majority of the respondents (94.4%) agreed that Universal Precaution is a good measure in reducing the risk of disease transmission.

Table 7A. Respondents' attitude to occupational hazards & control

What will you do if exposed to needle stick injury from infected patience	Frequency (%)
I will seek for Safety Measure	217(86.8)
Do nothing until Diagnosed	20(8)
Indifferent	13(5.2)

Field Survey, 2017

Table 7B. Respondents attitude to occupational hazards and control

Variable	Yes (%)	No (%)
Do you agree Needle Prick is not Enough to Transmit and cause HIV/AIDS	61(24.4)	189(75.6)
Do you agree that reporting HIV expose incidence and use of PEP endanger job	86(34.4)	163(65.2)
Decontamination and Sterilization of all Surfaces and Instrument necessary	227(90.8)	23(9.2)
Is recapping of Needle after use good	86(34.4)	164(65.6)
HIV Post Exposure Prophylaxis is not reducing the likelihood of HIV infection	165(42)	144(57.6)
Do you consider Safety Measures necessary	240(96)	10(4)
Should the Safety Measure be enforced in the Hospital	237(94.8)	13(5.2)
More knowledge about Occupational Hazards and its Control	238(95.2)	12(4.8)
Can you go for Periodic Examination to determine your Health Status	235(94)	15(6)

Field Survey, 2017

Table 7C. Respondents' attitude towards occupational hazards and control

What Universal Precaution does	Agree (%)	Disagree (%)
Universal Precaution, good measure preventing Disease transmission	236(94.4)	14(5.6)
Universal Precaution reduce disease transmission and contamination	236(94.4)	14(5.6)

Field Survey, 2017

Table 7D. Respondents attitude to occupational hazards and control measures

Variables	Frequency (%)
How conscious are you with respect to Universal Precaution	
Always	210(84.0)
Not always	32(12.8)
Indifferent	8(3.2)
Personal protective equipment not available, what will you do	
I will wait for the govt to provide it before I start using it	75(30)
I shall provide it for myself	164(65.6)
I will do nothing	10(4)

Table 7D shows that majority of the respondents (84.0%) expressed that they are always conscious of Universal Precaution. More than half of the respondents (65.6%) expressed that if the PEP is not provided in the Hospital, they procure it for themselves. While 30.0% expressed that it is the responsibility of the Government to provide them.

Fig. 2 shows that majority of the respondents (97.0%) have good attitude toward occupational hazards and its control in the hospital setting.

4. DISCUSSION

From the study, it was discovered that less than $1/10^{th}$ of the respondents have good knowledge of occupational hazards and control measures. This is in contrast to a study conducted in Malaysia [10] and Osun State [11] which showed that about 68.6% and 57.6% of the respondents have good knowledge of occupational hazards respectively. Low level of knowledge of occupational hazards and control among the respondents in this study could be due to non exposure to training on occupational hazards and this may constitute a stumbling block to effective control.

Among the respondents with good knowledge, majority are males 30.9%, respondents with primary level of education 33.4%, clinician 54.2% and pharmacy staff 57.1%. Majority of the respondents in this study have poor knowledge of occupational hazards and control. majority of this group of respondents are female, uneducated, laboratory professionals and laboratory staff. There is statistical significant association between gender, level of education, sub categories of staff and point of service, $P<0.05$. This finding is relatively similar to a study conducted in Osun State [11] where Medical Doctors are the majority with good knowledge 68.3%. Although in contrast in level of Education where those with Bachelor Degree are the majority 64.7%. The reason for disparity may be connected with low level of representation among the respondents. Because this is followed by those with Post Graduate

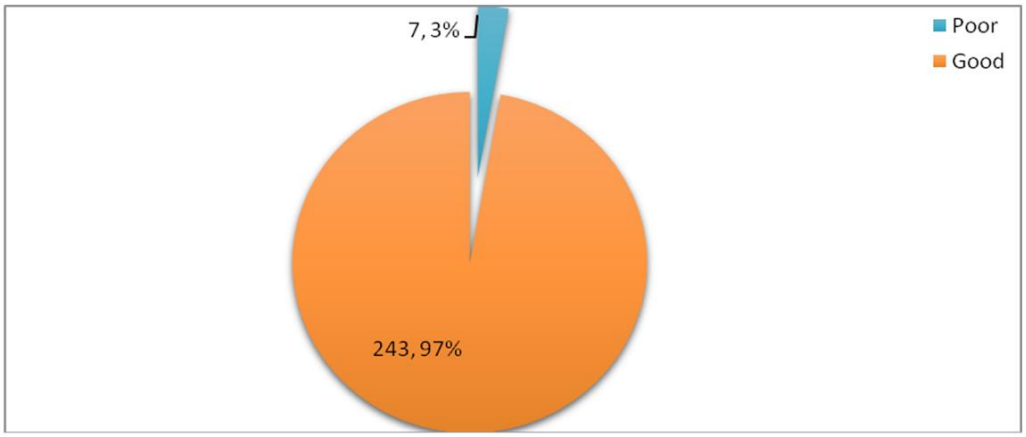

Fig. 2. Presentation of respondents by attitudinal scale

degree according to the result 27.3%. However, it was found that sex, level of education and job categories are significantly associated with knowledge in the study conducted in Osun State [11].

Majority of the respondents have positive Attitude towards Occupational hazards. This finding is consistent with the study conducted in Osun State [11] which revealed positive attitude of 80.0%. This is being attested by the fact that about 86.8% seek safety if they are exposed to Needle Stick injury. Seventy five point six percent (75.6%) of the respondents agreed that needle prick is enough to transmit HIV. About 57.6% agree that PEP can reduce the likelihood of HIV infection. Majority of the respondents 90.8% agreed that decontamination and sterilization of all surfaces and instrument is necessary. High level of positive attitude demonstrated by the workers may be due to personal experience and could ensure positive response to control measures.

5. CONCLUSION AND RECOMMENDATIONS

The concern of this study is on the knowledge of occupational hazards and its control measures among healthcare workers in General Hospital Minna. It is gathered that there is low percentage of respondents with good knowledge of occupational hazards, and that there is significant association between gender, level of education, professional lineage, point of service and knowledge grade.

Less than $1/10^{th}$ of the respondents were exposed to fluid from HIV/AIDS patients. Among these respondents, high number received Post Exposure Prophylaxis (PEP). The reasons for non receipt of PEP are Non positive and accessibility. Based on the findings of the study, the following recommendations are made:

i. Efforts should be made to widen good knowledge of occupational hazards across all works of General Hospital Minna;
ii. There should be a correction in the attitude of health workers towards occupational hazards;
iii. Health Education should be strengthened to enhance knowledge of health workers on the adoption of the use of PPE; and
iv. Health workers should attend training on occupational hazards and control measures at the hospital.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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