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## **Assessing needle stick injuries among workers in a nigerian hospital**

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### **Abstract**

Global attention is being drawn to medical waste with much attention to Needle Stick Injuries (NSI) as it poses health workers at risk of infection. A cross sectional descriptive study involving 170 Hospital workers (Health workers and support staff) in a Nigerian tertiary Hospital using a structured questionnaire was conducted. Of the 70 Health workers sampled comprising Doctors,

Nurses, and laboratory Scientists, 30%(21/70) were found to have had NSI, of the 100 support staff sampled comprising ward attendants, cleaners, waste handlers, incinerator operators, and cleaning supervisors, 47%(47/100) were found to have had NSI. Occupation of respondents was found to have significant effect on the occurrence of NSI among the Hospital's support staff at  $p < 0.05$ . This study revealed a high percentage of NSI among Hospital workers in the chosen Hospital of study. Training on medical waste management with much emphasis on NSI was recommended.

**Keywords:** Health workers, Support staff, Medical waste, Infection, Nigeria

## **Introduction**

Mismanagement of Healthcare Waste (HCW) may constitute health hazards to Hospital workers, the patient and the general community. NSI and other injuries from sharp objects place healthcare workers at risk of infection; There are more than 20 blood-borne pathogens that can be transmitted following an NSI or sharps injury, the most common are hepatitis B, hepatitis C and human immunodeficiency virus (HIV) [1, 2]. Sharp wastes though produced in small quantities may be highly infectious; globally, it is estimated that sharps injuries cause about 66 000 HBV, 16 000 HCV and 200–5000 HIV infections among health-care workers each year. For health-care workers worldwide, the attributable fractions for percutaneous occupational exposure to HBV, HCV and HIV are 37%, 39% and 4.4%, respectively. These bloodborne infections have serious consequences, including long-term illness, disability and death [3].

The psychological impact of NSI or sharps injury on a healthcare professional can be significant. [4] Identified depression, crying spells, tension in the family, relationship issues, panic attacks and excessive anxiety as responses following such an injury. In a similar manner, [5] found out that majority (80%) of the questionnaire respondents were concerned about the consequences and higher level of anxiety were reported when the patient was known to have a chronic infection. Lack of adequate protective medical/technical equipment, poor work routines,

lack of training on safe use/ disposal of needles and sharps, and lack of knowledge of the consequences of such injuries were reported as factors contributing to NSI. [6] Identified a hierarchy of controls to reduce the risk of exposure to blood-borne pathogens when priority is to eliminate and reduce the use of needles and other sharps where possible.

Following a survey among Nurses in a Nigerian Hospital, 62% has had at least one occupational NSI; similar report of more than 4,000 nurses carried out by the Royal College of Nursing, 48% of nurses had received an NSI or sharps injury. Studies have shown a high incidence of NSI in Nigeria [7, 8, 9] however, in the province of Ontario there was a reduction in NSI as reported by [10] following adoption of safety engineered needles. Almost 40% of NSIs and sharps injuries in the UK occurred to someone other than the original user of the device [11]. NSI most frequently involve a worker who is not the generator of the waste; [12] reported accidents when cleaning equipments, assisting in procedures, removing trash, and room cleaning. This study assessed NSI among hospital workers in a Nigerian major Hospital.

## **Materials and methods**

### **Study area**

This study was carried out as a cross sectional descriptive study at a tertiary healthcare facility (Teaching Hospital) in Nigeria. It is a major Hospital with 600 bed capacity and providing emergency, medical, surgical, radiology, obstetrics/ gynecology and child health services. It is a medical health institution which also trains medical students while offering health care services. The Hospital has over three thousand employees which include various professionals like Doctors, Nurses, Laboratory Scientists, Pharmacists, Engineers, Physiotherapists and Imaging Scientists. Others are: social workers, Nutritionists, Caterers, Accountants, Administrators etc. The hospital renders health care services to an average of one thousand patients per day.

### **Instruments of data collection**

Structured questionnaires, Observations and analyzing documents were used to collect

data for the purpose of the study. The Questionnaires were pre-tested and designed using closed ended questions. We administered two sets of questionnaires each containing two sections namely the biodata section and the research oriented questions. Respondents selected by quota are; health workers, engineers, administrators, cleaners and waste handlers, the quotas used are; profession and educational qualification. The questionnaires were distributed in 2013.

### **Sample and sampling techniques**

A total of 190 participants- including 70 Hospital Health workers, and 120 support staff were selected from the study population. The participants were selected using Quota sampling and simple random sampling techniques. The Quota sampling technique was used to select the category of staff to be included in the study while the Simple random sampling technique was used to select the patients' sample and individual staff from each category that were administered the questionnaires.

### **Data collection procedure and analysis**

Surveillance for waste management practices was observed. The questionnaires were administered personally to respondents in order to minimize error in completion (difficult items on the questionnaire were explained to the respondents). Observations of the hospital's waste management practices from the point of generation to final disposal were made. Quantitative data analysis method was adopted for analyzing the data collected and analysis were carried out using Data Tabulation (Frequency Distribution and percentage) and Chi Square for statistical analysis. The responses were recorded and analyzed with SPSS software.

### **Results**

Of the 190 questionnaires distributed, 170 were found suitable for analysis after editing.

Table 1 shows the respondents according to their profession.

**Table 1:** Professions of Respondents

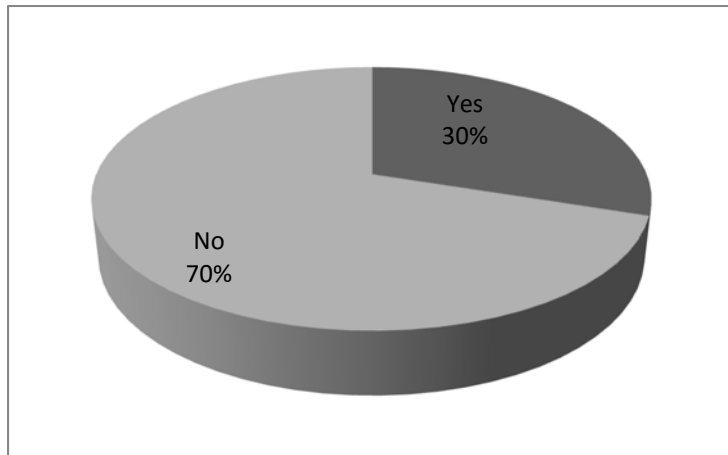
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<b>Distribution of health workers</b>		<b>Percentage</b>
Doctors	14	20.0
Nurses	15	21.4
Laboratory Scientists	30	42.9
Others	11	15.7
Total	70	100

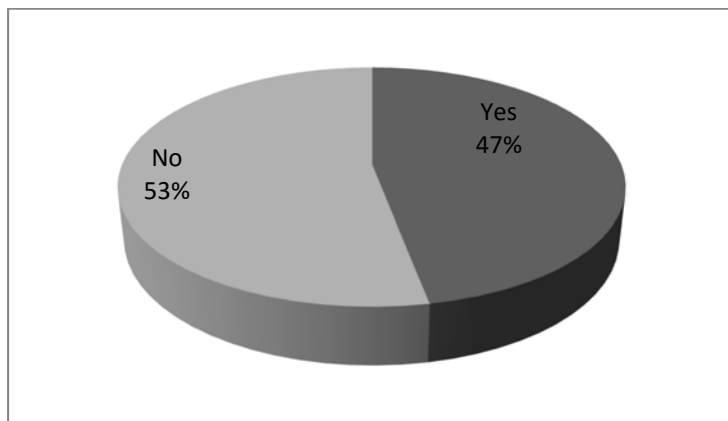
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<b>Support Staff</b>		<b>Percentage</b>
Ward Attendants	25	25%
Cleaners	53	53%
Waste handlers	9	9%
Incinerator Operators	3	3%
Cleaning Supervisors	10	10%
<i>Total</i>	100	100%

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**Fig. 1:** NSI among Hospital Health Workers (n=70)



**Fig.2:** NSI among Hospital support staff (n=100)

**Table 2:** shows the relationship between the occupation of Respondents (Support staff) and whether they have ever had a needle stick injury

**H<sub>0</sub>:** Occupation has no significant effect on the occurrence of needle prick among the hospital's support staff

**H<sub>1</sub>:** Occupation has significant effect on the occurrence of needle prick among the hospital's support staff

**Decision Rule:** Accept **H<sub>0</sub>** if  $\chi^2$  cal. is greater than ( $>$ )  $\chi^2$  0.05: Reject **H<sub>0</sub>** and accept the alternative Hypothesis (**H<sub>1</sub>**) if the  $\chi^2$  cal. is less than ( $<$ )  $\chi^2$  0.05

**Table 2:** relationship between the occupation of Support staff and whether they have ever had a needle stick injury

Occupation		Have you ever been pricked by a used needle?		
		Yes	No	Total
Ward Attendant etc	Count	14	11	25
	Expected Count	11.8	13.2	25.0
Cleaner	Count	17	36	53
	Expected Count	24.9	28.1	53.0
Waste Handler	Count	8	1	9
	Expected Count	4.2	4.8	9.0
Incineration Operator	Count	2	1	3
	Expected Count	1.4	1.6	3.0
Cleaning Supervisor	Count	6	4	10
	Expected Count	4.7	5.3	10.0
Total	Count	47	53	100
	Expected Count	47.0	53.0	100.0

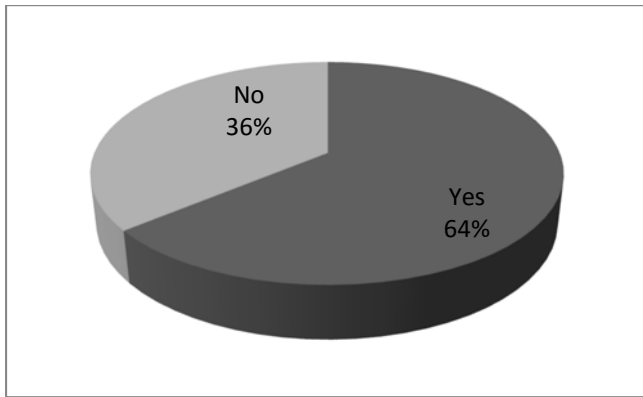
**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.036 <sup>a</sup>	4	.011
Likelihood Ratio	13.906	4	.008
Linear-by-Linear Association	1.312	1	.252
N of Valid Cases	100		

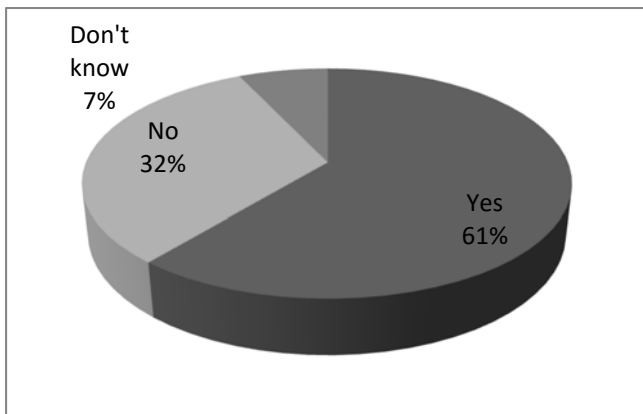
**COMMENT:** Since  $\chi^2$  cal. (0.011)  $<$   $\chi^2$  0.05, we reject null-hypothesis (**H<sub>0</sub>**) and accept **H<sub>1</sub>** thus, conclude that the occupation of respondents has significant effect on the occurrence of NSI among the hospital's support staff.

**Table 3:** Response of Health Workers to the Question- Mismanagement of medical waste constitutes great risk to human health?

Health workers	Frequency	%
Yes	70	100
No	0	0
Total	70	100



**Fig.3:** Distribution of support staff who had taken hepatitis B vaccine (n=100)



**Fig 4:** Distribution of support staff to the Question- Do you fall sick more often now than when you started doing this job? (n=100)



## **Discussion**

All healthcare professionals are at risk from NSIs and sharps injuries. Continuing implementation of safe working practices is paramount, as are risk assessment, risk elimination, training in the use of devices and awareness of the consequences of NSIs and sharps injuries. Healthcare professionals have a pivotal role in assessing risks and evaluating any new safety devices introduced in their clinical area. Approximately 3million NSI occur annually among Healthcare Workers worldwide [13].

Hospital workers including Doctors, Nurses, Laboratory scientists, Support staff such as cleaners, ward attendants, waste handlers, incinerator operators, are at risk of acquiring NSI. This study revealed more incidence of NSI in the support staff who are not the generator of such category of healthcare waste. [14] Reported 40% of NSI in the UK occurred to someone other than the original user of the devise. In a similar report by Cone 2000, equipment or instrument cleaning, assisting in procedures, removing trash, and room cleaning were the most common activities associated with NSI. Majority, 64%(64/100) of the support staff had however been vaccinated against Hepatitis B though more (61%) claimed they fall sick more after assuming the job these are shown in figures 3 and 4 respectively. [15] reported similar finding in a teaching Hospital where 57.8% of waste collectors (support staff) had experienced back pain, malaria, skin infections, and waist pains believed to be associated with their occupation. Occupation of support staff has significant effect on the occurrence of NSI as revealed on table 2. There was 100% positive response to management of medical waste constituting great risk to human health by Hospital health workers.

## **Conclusion and recommendations**

NSIs and sharps injuries can transmit disease and therefore are a significant occupational hazard for healthcare professionals. This study revealed a higher percentage of NSI among the Hospital support staff 47/100(47%) compared to the Hospital Health Workers 21/70(30%). Training on Medical Waste Management with much emphasis on Needle and sharp Wastes and provision of waste management materials were recommended.

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### *Authors Column*



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