



### Prevalence of Occupational Accidents/Injuries among Health Care Workers in a Federal Medical Centre in Southern Nigeria

*Prevalence d'accidents/Blessures au Travail Chez le Personnel Soignant Dans un Centre de Santé Fédéral au Sud du Nigeria*

A. R. Isara, A. N. Ofili

#### ABSTRACT

**BACKGROUND:** Health care workers (HCWs) are prone to occupational accidents and injuries such as needle pricks in the course of their day to day activities in the health care setting.

**OBJECTIVE:** To determine the prevalence of needle sticks and other occupational exposures among HCWs in a Nigerian tertiary hospital.

**METHODS:** This was a descriptive cross sectional design involving all the doctors, and all laboratory workers and a selection of nurses. A structured, pre-tested, self-administered questionnaire was the tool for data collection.

**RESULTS:** A total of 167 HCWs made up of 47 (28.1%) doctors, 100 (59.9%) nurses and 20 (12.0%) laboratory workers were interviewed. Twenty-five (53.2%) doctors, 53 (53.0%) nurses and 10 (50.0%) laboratory workers making a total of 88 (52.7%) HCWs had had needle pricks, while 28 (59.6%) doctors, 53 (53.0%) nurses and 8 (40.0%) laboratory workers making a total of 89 (53.3%) have had blood splashes. A higher proportion of nurses 54 (54.0%) had cuts from drug ampoules than doctors (34.0%) while 16 (36.2%) doctors had glove perforation during surgery compared to nine (9.0%) nurses. Only 43 (25.7%) HCWs reported to the staff clinic after sustaining accidents/injuries.

**CONCLUSION:** The prevalence of needle sticks and other occupational accidents/injuries among HCWs in the Federal Medical Centre, Asaba, Nigeria is high. There is also a high rate of non-reporting of these injuries to relevant authorities. All health facilities should have a written injection safety policy and a post-exposure protocol and HCWs should be continually educated on them. *WAJM* 2012; 31(1): 47–51.

**Keywords:** Needle sticks, accidents/injuries, health care workers, Federal Medical Centre.

#### RÉSUMÉ

**CONTEXTE:** Les personnels soignant (PS) sont sujets à des accidents et blessures telles que les piqûres d'aiguilles au cours de leur activité au quotidien dans leur service de soins.

**OBJECTIF:** Déterminer la prévalence de piqûres d'aiguilles et autres expositions professionnelles parmi des PS dans un hôpital tertiaire du Nigeria.

**METHODES:** Il s'agit d'une étude descriptive transversale incluant tous les médecins, tous les travailleurs de laboratoire et une sélection d'infirmiers. Un questionnaire structuré, pré-testé puis auto administré était l'outil de collecte de données.

**RESULTATS:** Un total de 167 PS dont 47 (28,1%) médecins, 100 (59,9%) infirmiers et 20 (12,0%) travailleurs de laboratoire a été interviewé. Vingt cinq (53,2%) médecins, 53 (53,0%) infirmiers et 10 (50,0%) travailleurs de laboratoires soit un total de 88 (52,7%) PS avaient eu une piqûre d'aiguille, tandis que 28 (59,6%) médecins, 53 (53,0%) infirmiers et 8 (40,0%) travailleurs de laboratoire soit un total de 89 (53,3%) ont été éclaboussés par du sang. Une proportion plus élevée d'infirmiers 54 (54,0%) a eu des coupures par des ampoules de médicaments comparée aux médecins (34,0%) tandis que 16 (36,2%) médecins ont eu une perforation de gants pendant la chirurgie comparé à 9 (9,0%) infirmiers. Seuls 43 (25,7%) PS se sont présentés au staff médical au décours d'accidents/blessures.

**CONCLUSION:** La prévalence de piqûres et autres accidents/blessures au travail chez des TS au Centre médical Fédéral Asaba, Nigeria est élevée. Il y'a aussi un taux élevé de non notification de ces traumatismes aux autorités compétentes. Toutes les structures de santé devraient afficher des protocoles écrits de sécurité pour l'usage des aiguilles et les PS devraient être éduqués à ces protocoles de façon continue. *WAJM* 2012; 31(1): 47–51.

**Mots clés:** Piqûres d'aiguille, accidents/blessures, personnels soignant, centre médical féd

Department of Community Health, School of Medicine, University of Benin, P. M. B. 1154, Benin City, Nigeria.

**Correspondence:** Dr. A. R. Isara, Department of Community Health, School of Medicine, University of Benin, P. M. B. 1154, Benin City, Nigeria. E-mail: mansaray2001@yahoo.com +2348034057565

**Abbreviations:** FMC, Federal Medical Centre; HBV, Hepatitis B Virus; HCV, Hepatitis C Virus; HCW, Health Care Workers; HIV, human immunodeficiency virus; PEP, Post Exposure Protocol; PPE, Personal Protective Equipment/attire.

## INTRODUCTION

The World Health Organisation (WHO) estimates that 16 billion injections are administered annually in developing countries with a vast majority (90–95%) of these injections given for therapeutic purposes.<sup>1</sup> All these injections are administered by health care workers (HCW) in the course of their day-to-day activities at work while caring for patients, thus putting them in the danger of accidentally sustaining needle pricks. In the health care setting, HCWs are also exposed to other occupational accidents such as splashes from blood and other body fluids, cut from drug ampoules, scalpel cuts, glove perforation during surgery, contact with patients' blood with ungloved hands and open wound contamination with patients' blood.<sup>2</sup> These accidents expose the HCWs to blood borne infections such as human immunodeficiency virus (HIV), hepatitis B (HBV) and hepatitis C (HCV) infections.

The magnitude of these problems necessitated the Centre for Disease (CDC) to institute measures contained in the standard precautions which include among others hand washing, personal protective equipment/attire (PPE), appropriate use of instruments and equipments, vaccination, education and post exposure protocol (PEP).<sup>3</sup> The CDC recommends that the injured HCW should be seen, evaluated and treated within two hours period of time, beginning from the time of the exposure. The HCW need to report the injury at once to the designated person in the health facility and a protocol should then be followed to ensure an immediate and confidential medical evaluation with appropriate testing of the HCW and the source patient (if known).<sup>3</sup> The strict adherence to the standard precautions by HCWs and the setting up of post exposure protocol by health facilities which should take effect immediately a HCW makes it known that there was an exposure will greatly reduce the risk of transmission of blood borne pathogens.<sup>4</sup>

The lack of an existing post exposure protocol and standard precaution guidelines/policies in hospitals will lead to poor knowledge of standard precautions by HCWs as have

been demonstrated in previous studies,<sup>5-7</sup> thus, HCWs are not likely to know the necessary actions to take when they sustain accidental injuries. Several studies have also shown a high rate of needle pricks and exposures to blood and body fluids among health care workers.<sup>8-13</sup> However, it is very worrisome that majority of the accidental injuries/exposures are not reported to the hospital authorities and thus no post exposure prophylaxis is given to the HCWs following exposures.<sup>8,10,14-16</sup>

The objective of this study was to determine the prevalence of needle sticks and other occupational exposures among HCWs in the Federal Medical Centre, Asaba, Delta State, Nigeria, a tertiary hospital that provide health care delivery to the people of Delta State and neighbouring States in the Southern part of Nigeria and also to ascertain the actions taken by these HCWs when they sustain occupational accidents.

## SUBJECTS, MATERIALS AND METHODS

This descriptive, retrospective cross-sectional study was carried out in the Federal Medical Centre (FMC) Asaba, Delta State, Nigeria, from January to March, 2006. The hospital is a Federal Government-owned tertiary health facility situated in Asaba the Delta State capital. The hospital provides tertiary health care delivery to the people of Delta state and neighbouring States in the southern part of Nigeria. Permission to conduct this study was obtained from the Medical Director of the hospital while individual consent was also sought from the HCWs with full assurance of confidentiality before the commencement of the study.

**Participants:** The study populations were doctors, nurses and laboratory workers in the hospital who had spent at least 6 months in the hospital. This was to allow sufficient time for exposures to occupational accidents/injuries. The calculated minimum sample size using the formulae for studying proportions with population less than 10,000 was 115. All doctors (N = 47) and all laboratory workers (N = 20) were included in the study. However, a stratified sampling

method was used to select a total of 100 nurses (two third of the nurses' population) who were included in the study.

**Data Collection:** The tool used for the collection of data was a structured, pre-tested, self-administered questionnaire. The questionnaire which was pretested among HCWs in the University of Benin Teaching Hospital, Benin City and necessary corrections and adjustments were then made on the questionnaire before the commencement of the study. This questionnaire was used to collect information such as socio-demographic data of the HCWs and their exposures to needle pricks and other occupational accidents for a period of six months preceding the study.

**Statistical Analysis:** The questionnaires retrieved from the health care workers were checked for correctness and coded before they were entered into the computer. SPSS version 13 statistical software was used for data analysis. Chi Square statistical test was used to compare the association between occupation of the HCWs and some of the occupational accidents/injuries sustained by them. The level of significance set at  $P < 0.05$  and confidence level at 95%.

## RESULTS

A total of 167 health care workers made up of 47 (28.1%) doctors, 100 (59.9%) nurses and 20 (12.0%) laboratory workers participated in this study.

### Distribution of the HCWs by Age and Sex:

The mean age of the doctors was  $37.5 \pm 6.8$  years with majority of them 18 (38.3%) in the age group 35-39 years. Majority of the nurses 29 (29.0%) were in the age group 30 – 34 years and their mean age was  $37.0 \pm 7.2$  years while majority of the laboratory workers 9 (45.0%) were in the age group 30 - 34 years and their mean age was  $35.1 \pm 4.7$  years. The doctors were made up of 38 (80.9%) males and 9 (19.1%) females, the nurses were 11 (11.0%) male and 89 (89.0%) female while the laboratory workers were 9 (45.0%) male and 11 (55.0%) female.

**Occupational Accidents/Injuries:** The occupational accidents and injuries sustained by the HCWs are shown in Table 1. Twenty five (53.2%) doctors, 53 (53.0%) nurses and 10 (50.0%) laboratory workers making a total of 88 (52.7%) HCWs had had needle pricks, while 28 (59.6%) doctors, 53 (53.0%) nurses and 8 (40.0%) laboratory workers making a total of 89 (53.3%) had had blood splashes. A total of 67 (40.1%) HCWs made up of 21 (44.7%) doctors, 36 (36.0%) nurses and 10 (50.0%) laboratory workers had had contact with patients' blood with ungloved hands. Sixteen (34.0%) doctors and 54 (54.0%) nurses making a total of 70 (41.9%) HCWs had had cuts from drug ampoules while 2 (4.3%) doctors and 10 (10.0%) nurses had had scalpel cuts. Seventeen (36.2%) doctors and nine (9.0%) nurses had had glove perforation during surgery. This is not applicable to laboratory workers. The contamination of open wound by blood and body fluids of patients was sustained by three (6.4%), two (2.0%) and two (10.0%) doctors, nurses and laboratory workers respectively.

Table 2 shows the measures taken by HCWs when puncture injuries were accidentally sustained. Ninety (53.9%) HCWs made up of 26 (55.3%) doctors, 53 (53.0%) nurses and 11 (55.0%) laboratory workers would wash the areas quickly and squeeze out the blood while 60 (35.9%) HCWs made up of 18 (38.3%) doctors, 42 (42.0%) nurse and 10 (50.0%) laboratory workers would clean with a disinfectant and cover the wound with plaster. A total of 70 (41.9%), 44 (26.3%), 23 (13.8%) and 21 (12.6%) HCWs would screen the patient for HIV after consent, screen the patient to determine his/her HBV status, treat and take blood for HIV screening and go for check-up/immunize with HBV vaccine respectively. Twelve (25.5%) doctors, 24 (24.0%) nurses and 7 (35.0%) laboratory workers making a total of 43 (25.7%) HCWs would report to the staff clinic while 2 (4.8%) doctors and 10 (10.0%) nurses would disinfect the area with methylated spirit only.

The association between the primary duties of the HCWs and some occupational accidents/injuries sustained by them is shown in Table 3. Only the association between the cuts from

**Table 1: Occupational accidents and injuries of the respondents\***

Accident	Doctors (%) n = 47	Nurses (%) n = 100	Laboratory workers (%) n = 20	Total n = 167
Needle pricks	25 (53.2)	53 (53.0)	10 (50.0)	88 (52.7)
Scalpel cut	2 ( 4.3)	10 (10.0)	0 (0.0)	12 ( 7.2)
Cut from Ampoules	16 (34.0)	54 (54.0)	0 (0.0)	70 (41.9)
Blood splashes on the face or other parts of the body	28 (59.6)	53 (53.0)	8 (40.0)	89 (53.3)
Contact with patients blood with ungloved hands	21 (44.7)	36 (36.0)	10 (50.0)	67 (40.1)
Open wound contamination	3 ( 6.4)	2 (2.0)	2 (10.0)	7 ( 4.1)
Glove perforation during surgery	17 (36.2)	9 (9.0)	0 (0.0)	26 (15.6)

\*Multiple responses

**Table 2: Measures taken by Respondents after Injuries are Sustained\***

Measures	Doctors (%) n = 47	Nurses (%) n = 100	Laboratory workers (%) n = 20	Total n = 167
Clean with disinfectant and cover wound with plaster	25 (53.2)	42 (42.0)	10 (50.0)	60 (35.9)
Disinfect area with methylated spirit	2 ( 4.3)	10 (10.0)	0 (0.0)	12 (7.2)
Treat and take blood for HIV screening	5 (10.6)	14 (14.0)	4 (20.0)	23 (13.8)
Go for checkup and take HBV vaccination	3 ( 6.4)	17 (17.0)	1 (5.0)	21 (12.6)
Wash area quickly and squeeze out blood	26 (55.3)	53 (53.0)	11 (55.0)	90 (53.9)
Report to staff clinic	12 (25.5)	24 (24.0)	7 (35.0)	43 (25.7)
Screen patient for HIV after obtaining consent	25 (53.2)	37 (37.0)	8 (44.0)	70 (41.9)
Screen patient to determine HBV status	11 (23.4)	28 (28.0)	5 (25.0)	44 (26.3)

\*Multiple responses

drug ampoules and glove perforation during surgery among doctors and nurses was statistically significant.

**DISCUSSION**

The two commonest occupational accidents among the HCWs this study were blood splashes on the face or other parts of the body (53.3%) and needle pricks (52.7%). This findings is slightly different from what was reported by Ofili et al in Benin City where the two commonest work related accidents were contact with patients' blood with ungloved hands (53.7%) and blood

splashes on the face and other parts of the body (43.0%).<sup>2</sup> The high prevalence of needle pricks which is a percutaneous injury seen in this study is consistent with previous studies<sup>9,10,13</sup> and a clear indication that the HCWs are at a high risk of developing blood borne infections. More than a half (54%) of the nurses had cuts from drug ampoules as opposed to 34% of doctors. This is not surprising because apart from the fact that nurses handle more drug ampoules in the course of their duties in the health care setting than other HCWs, the house officers (medical interns) who usually administer

**Table 3: Association between occupation and some occupational accidents/injuries sustained by the respondents**

Occupation	Occupational Accidents/Injuries		$\chi^2$	p value
	Yes Frequency (%)	No Frequency (%)		
<b>Needle Pricks</b>				
Doctor	25 (53.2)	22 (47.8)	0.07	0.967
Nurses	53 (53.0)	47 (47.0)		
Laboratory workers	10 (50.0)	10 (50.0)		
<b>Blood Splashes</b>				
Doctors	28 (59.6)	19 (41.4)	2.28	0.304
Nurses	53 (53.0)	53 (53.0)		
Laboratory workers	8 (40.0)	12 (60.0)		
<b>Cuts from ampoules</b>				
Doctors	16 (34.0)	31 (66.0)	5.11	0.024*
Nurses	54 (54.0)	46 (46.0)		
<b>Blood contact with ungloved hands</b>				
Doctors	21 (44.7)	26 (56.3)	1.93	0.382
Nurses	36 (36.0)	64 (64.0)		
Laboratory workers	10 (50.0)	10 (50.0)		
<b>Glove perforation during surgery</b>				
Doctors	17 (36.2)	30 (63.8)	16.21	0.001*
Nurses	9 (9.0)	91 (91.0)		

\*Statistically significant

intravenous drug to in-patients were not working in the hospital as at the time of the study. A higher proportion of doctors sustained glove perforation during surgery than nurses. This could probably be due to the fact that doctors are the major actors during surgical operations while the nurses play the role of assistants.

It was observed that in this day and age, 40% of the HCWs had contact with patients' blood with ungloved hands while 7% of them sustained open wound contamination. This goes to show that HCWs in this part of the world are yet to come to terms with the teachings of the CDC that all patients should be treated as potentially infectious<sup>3,4</sup> and a demonstration of poor knowledge and practice of standard precautions by HCWs as shown in many previous studies.<sup>5-7</sup> Although there was no statistically significant association between the different categories of HCWs and their contact with patients' blood with ungloved hands ( $p=0.382$ ), a higher proportion of the laboratory workers (50.0%) were involved in this practice. This might be as a result of the fact that the doctors and nurses are more

knowledgeable about standard precautions than the laboratory workers. When puncture injuries are accidentally sustained or there was an occupational exposure to blood, more half of the HCWs would wash the area quickly and squeeze out the blood. This is quite encouraging, however, only 35.9% of them would clean the area with a disinfectant and cover wound with plaster and this could be the reason why some of them had open wound contamination in this study. In this study, few HCWs (25.7%) reported accident/injuries to the hospital authorities. The high non-reporting rate (74.3%) in this study is similar to what was obtained in many previous studies,<sup>10,14,16,17</sup> but far higher than what was recorded in a study by Rabaud et al which showed a non reporting rate of 48.5%.<sup>18</sup>

Although, the CDC recommends the immediate reporting of all accidents and exposures so that post-exposure prophylaxis can be instituted within 2 hours of such accidents<sup>3,4</sup>, most of those accidents were unreported in this study. This could be due to the fact that there is no existing post-exposure protocol in the hospital and a poor perception of the risk

of contacting blood borne infections from such accidents/injuries by the HCWs. A major contributor to this could also be the non existence of an injection safety policy and an infection control unit in many tertiary hospitals in the country. A limitation in this study was the fact that the data relied on self report of occupational accidents/injuries by the HCWs over a period of six months preceding the study. They are therefore prone to recall bias.

**Conclusion:** This study has shown a high prevalence of needle sticks and other occupational accidents/injuries among HCWs in the Federal Medical Centre, Asaba, Nigeria and the actions taken by them when they sustain these injuries was grossly inadequate. There is also a high rate of non-reporting of these injuries by the HCWs to relevant authorities. Thus majority of them do not have any form of post-exposure prophylaxis or even screen for any of the blood borne infections that could result from such accidents/injuries.

**Recommendations:** There should be continuing education of HCWs on the dangers associated with occupational accidents/injuries in the healthcare setting to improve their knowledge and practice of standard precautions. All health facilities should have a written injection safety policy and a post-exposure protocol boldly displayed in strategic locations within the hospital complex and made available to all HCWs. Measures should also be employed by the management of the hospitals to ensure that these policies are adhered by the HCWs.

#### Conflict of interest

We the authors declare that there was no conflict of interest.

#### REFERENCES

1. World Health Organisation. WHO 2002 Report: Reducing Risks, Promoting Healthy Life. *WHO, Geneva*, 2002.
2. Ofili AN, Asuzu MC, Okojie OH. Work related accidents and knowledge of health workers about blood borne diseases in a health industry in Nigeria. *Niger Med J*. 2004; **45**: 64 – 70.

3. CDC. Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B virus to Health care and public safety workers. *MMWR*. 1989. Vol. 38: No. S-6.
4. CDC. Guidelines for the management of occupational Exposures to HBV, HCV and HIV and Recommendations for post exposure prophylaxis, *MMWR*. 2001/50 (RR11); 1-42.
5. Ofili AN, Asuzu MC, Okojie OH. Knowledge and practice of universal precautions among doctors and Laboratory workers in Central Hospital, Benin City Nigeria. *JMBR*, 2002; **1**: 34-42.
6. Ofili AN, Asuzu MC, Okojie OH. Knowledge and practice of Universal precautions among nurses in Central Hospital, Benin City, Edo State, Nigeria. *Postgrad Med J*. 2003; **10**: 26-31.
7. Stein AD, Makarawo TP, Ahmad MF. Knowledge, attitudes and compliance with infection control guidelines in Birmingham Teaching Hospitals. *J Hosp Infect*. 2002; **54**: 68-73.
8. Adegboye AA, Moss GB, Soyinka F, Kreiss JK. The epidemiology of Needlestick and sharp instrument accidents in a Nigerian hospital. *Infect Control Hosp Epidemiol*. 1994; **15**: 27-31.
9. Zhang M, Wang H, Miao J, Du X, Li T, Wu Z. Occupational exposure to blood and body fluids among health care workers in a general hospital, China. *Am J Ind Med*. 2009; **52**: 89-98.
10. Efetie ER, Salami HA. Prevalence of, and attitude towards needle-stick injuries by Nigerian gynaecological surgeons. *Niger J Clin Pract*. 2009; **12**: 34-6.
11. Rada AA, Vandeweerd JM, Syre TR, Egata G. HIV/AIDS and exposure of healthcare workers to body fluids in Ethiopia: attitudes toward universal precautions. *J Hosp Infect*. 2009; **71**: 163-9.
12. Wicker S, Jung J, Allwinn R, Gottschalk R, Rabenau HF. Prevalence and prevention of needlestick injuries among health care workers in a German university hospital. *Int Arch Occup Environ Health*. 2008; **81**: 347-54.
13. Nsubuga FM, Jaakkola MS. Needle stick injuries among nurses in sun-Saharan Africa. *Trop Med Int Health*. 2005; **10**: 773 - 81.
14. Shiao JS, Mclaws ML, Huang KY, Ko WC, Guo YL. Prevalence of nonreporting behavior of sharps injuries in Taiwanese health care workers. *Am J Infect Control*. 1999; **27**: 254-7.
15. MacDonald MA, Elford J, Kaldor JM. Reporting of occupational exposures to blood-borne pathogens in Australian teaching hospitals. *Med J Aust*. 1995; **163**: 121-3.
16. Gurubacharya DL, Mathura KC, Kark DB. Knowledge, attitude and practice among health care workers on needlestick injuries. *Katmandu Univ Med J*. 2003; **1**: 91-4.
17. Kennedy R, Kelly S, Gonsalves S, McCann PA. Barriers to the reporting and management of needlestick injuries among surgeons. *Ir J Med Sci*. 2009; **178**: 297-9.
18. Rabaud C, Zanea A, Mur JM, Blech MF, Dazy D, May T, Guillemin F. Occupational exposure to blood: search for a relation between personality and behaviour. *Infect Control Hosp Epidemiol*. 2000; **21**: 564-74.