

# Perceived Occupational Risk of Contracting HIV and Occupational Exposure to Blood and Body Fluids among Nurses Working in Nigerian Correctional Services Health Facilities in Abuja

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## ABSTRACT

**Objective:** To assess perceived occupational risk of contracting HIV and occupational exposure to blood and body fluids among nurses working in Nigerian Correctional Services health facilities in Abuja.

**Methods:** This descriptive cross-sectional study was conducted among nurses working in the medical centres of Nigerian Correctional Service in Abuja, Nigeria. A self-administered structured questionnaire which assessed their demographic characteristics, the prevalence of occupational exposures, receipt of training on occupational exposures, their exposure to HIV positive patients and their perceived risk of contracting HIV at work was the data collection tool. Data obtained was subjected to descriptive and inferential statistics using SPSS software version 22.0.

**Results:** Out of 55 questionnaires distributed who fulfilled the inclusion criteria, 52 were returned giving a response rate of 94.5%. The majority 42 (80.7%) of the participants were females. The perceived occupational risk of contracting HIV was very high 8 (15.4 %) and high 22 (42.3%) among the participants. Two thirds 35 (67.3 %) of the participants never received training on prevention of occupational exposure. Regarding prevalence of occupational exposure, 57.7%, 53.8%, 69.2% of the participants had experienced needle stick injury, contaminated sharp injury, splashed by blood or any body fluids and non intact skin exposure at least once in the last 12 months respectively. The majority (48.1%) of the participants were exposed due to unexpected movement of patient during blood sampling and with 28.8 % and 21.2% exposure occurring in the surgical and emergency room respectively. Less than half (48.1%) of the participants reported of their exposure while 51.9% did not report their exposure.

**Conclusion:** Various types of occupational exposure to blood and body fluids were prevalent among the participants. The majority of the participants perceived their occupational risk of contracting HIV as high and very high. There is a need to provide training for the nurses to prevent and control occupational exposure, promote reportage in the event of occurrence and how to facilitate availability of personal protective equipment at all times for nurses.

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## INTRODUCTION

Occupational hazard which can be biological and non-biological is a significant workplace problem in healthcare system (McDiarmid, 2014). Occupational exposure which may be defined as a situation in which workers are exposed to harmful substances or pathogens of infectious diseases during the process of diagnosis, treatment, and nursing, is a common form of biological hazard among health workers (Rózańska et al., 2014).

Nurses as an essential part of the healthcare team are involved in frontline work and are direct contact with patients to provide care. Hence, they are exposed to blood and body fluids through non-intact or intact skin, percutaneous, and per mucosal routes while providing care. Occupational exposure has been cited as a serious problem for nurses providing care for patients (Liu et., 2024). Hsieh et al. (2006) who explored blood and infectious body fluid exposures for health care workers showed that nurses had the highest percentage (60.6%) of exposure in comparison with other health workers.

The risk of these exposures among nurses is higher in developing countries due to high workload, insufficient resources and equipment. The consequences of exposure to blood and body fluids which are enormous may include psychological problems, transmission of infection, injuries and pain. Occupational exposure precipitate adverse psychological issues thereby negatively impacting quality of nursing care and patients' medical safety, therapy, and recovery with a resultant socioeconomic burden (Liu et., 2024). The transmitted infections through occupational exposure include but not limited to hepatitis B virus, hepatitis C virus, human immunodeficiency virus (HIV), Herpes simplex 1 and 11 infection and Treponema pallidum (TP) infection (Dement et al., 2004; Prüss-Ustün et al., 2005; Mahamat et al., 2021; Scott et al., 2023)

Exposure to blood and body fluids is mostly caused by needle-stick injuries (Belachew et al., 2017). However, one of the most important problems in occupational exposure is that about one-third of the victims do not report their exposures (Fullerton & Gibbons, 2011; Dia et al., 2012). Underreporting this hazard may result in insufficient attention to this problem and inadequate preventive planning to reduce it.

Although, studies (Adejumo & Olatunji, 2014; Isara et al., 2015) on occupational exposure have conducted in Nigeria among nurses in different hospitals, none to the best knowledge of the authors has been conducted among nurses working in Nigerian Correctional Services Medical

Centres. The importance of Nurses in Correctional institutions cannot be overemphasized because they tend to serve as first-line defence for any emergency arriving at any health centre so their knowledge of emergency is paramount to the outcome of any treatment. As we continue to move full speed into the era of patient-centered medicine, the ability of nurses to affect the perceived quality of care and their knowledge of occupational exposure is becoming more significant. Understanding the magnitude of occupational exposures in terms of prevalence, causes and reportage among nurses in Nigerian Correctional Services will inform development of success oriented strategic policy to prevent and minimize occupational exposures among nurses in the Service.

The objective of this study was to assess perceived occupational risk of contracting HIV and occupational exposure to blood and body fluids among nurses working in Nigerian Correctional Services health facilities in Abuja.

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## MATERIALS AND METHODS

This cross-sectional study of nurses working in Henry Akingba Medical and Research Centre (HAMRC) in the National Headquarters and Kuje Custodial hospital under the FCT Command located in Abuja, Nigeria was conducted between March and June 2016. Both facilities had over 12 beds. All nurses on duty were included in the study, but ill individuals and those on official leave were excluded from the study. A quantitative data collection method was done using a self-administered questionnaire. The questionnaire was developed based on relevant information gathered from extensive literature review, input from experienced medical researchers and researcher's personal observations during clinical interactions served as the study instrument. The questionnaire elicited information on socio-demographic characteristics like age, sex, rank, experience, knowledge on the occupational hazard and its sources, training on prevention of occupational exposure, occurrence of sharp injury at work, frequency of contact with needles or other sharp devices at work, attitude, and practices. The questionnaire was administered to nurses at their duty post. Ethical approval was obtained from relevant Department of the Service at the National Correctional headquarters. Prior to respondents'

verbal consent, they were informed about the purpose of the study and were made to understand that participation was voluntary and refusal to participate in the study attracts no penalty. The study respondents were assured of confidentiality and personal identifiers were removed in the summary data to ensure confidentiality in accordance with the Declaration of Helsinki. After data collection, the response was coded and entered into a computer using SPSS version 22.0 to process and analyse the data. Data obtained was subjected to descriptive statistics. The data were presented as tables, and figures.  $P < 0.05$  was considered significant.

## RESULTS

Out of 55 questionnaires distributed who fulfilled the inclusion criteria, 52 were returned giving a total response rate of 94.5%.

### Socio-Demographic Characteristics of the Study Participants

About one third 18 (34.6%) of the participants are aged 41-50 years. The mean age of the participants was  $43.19 \pm 9.73$  years. more than three quarters 42 (80.7%) of the participants were females. Nearly four tenth 20 (38.5%) of the participants had worked for 21-30 years. The majority 14 (26.9%) of the participants rank in the Service was PIP. Half of the respondents 26 (50.0%) work in the PMC(HAMRC) (Table 1).

Table 1: Socio-Demographic Characteristics of Study Participants

| Characteristics            | Frequency (n) | Percent (%)  |
|----------------------------|---------------|--------------|
| <b>Age (years)</b>         |               |              |
| 21-30                      | 6             | 11.5         |
| 31-40                      | 14            | 26.9         |
| 41-50                      | 18            | 34.6         |
| 51-60                      | 14            | 26.9         |
| <b>Gender</b>              |               |              |
| Male                       | 10            | 19.2         |
| Female                     | 42            | 80.7         |
| <b>Years of experience</b> |               |              |
| 1-10                       | 11            | 21.2         |
| 11-20                      | 15            | 28.8         |
| 21-30                      | 20            | 38.5         |
| 31-40                      | 6             | 11.5         |
| <b>Rank</b>                |               |              |
| IP                         | 1             | 1.9          |
| SIP                        | 12            | 23.1         |
| PIP                        | 14            | 26.9         |
| ACIP                       | 8             | 15.4         |
| DCIP                       | 5             | 9.6          |
| SOC                        | 2             | 3.8          |
| CSP                        | 3             | 5.8          |
| ACP                        | 3             | 5.8          |
| DCP                        | 1             | 1.9          |
| CP                         | 3             | 5.8          |
| <b>Hospital</b>            |               |              |
| PMC(HAMRC)*                | 26            | 50.0         |
| Kuje**                     | 26            | 50.0         |
| <b>Total</b>               | <b>52</b>     | <b>100.0</b> |

**Notes:** \*Refers Prison Medical Centre (Henry Akingba Medical and Research Centre, \*\* refers to Kuje Custodial Hospital,

### Perceived risk for occupational HIV contagion among the participants

The above report showed that 8 (15.4 %) respondents believed that their perceived risk of contracting HIV was very high, and 22 (42.3%) perceived the risk of exposure to be high while

15.4 % and 23.1% considered the risk as moderate and low, respectively. (Table 2).

### Contact with HIV positive patients and HIV testing after occupational exposure among the participants

Reports showed that 35 (67.3 %) respondents have never received training on prevention of

occupational exposure. While 39(75%) have attended to patient with HIV. Half of the respondents 26(50%) had tested for HIV after occupational exposure. (Table 3)

#### **Occupational exposure among the participants in the last 12months**

Regarding prevalence of occupational exposure, 57.7%, 53.8%, 69.2%, 44.2%, 25% of the participants had experienced needlestick injury, contaminated sharp injury, splashed by blood or any body fluids, Non intact skin exposure (exposed skin that is chapped, abraded or afflicted with dermatitis come into contact with blood or body fluids, human bite, at least once in the last 12 months respectively (Table 4).

#### **Reasons for occupational exposure among the participants**

The majority (48.1%) of the participants were exposed due to unexpected movement of patient during blood sampling. Our study indicates that about (17.3%) responded that they were exposed during childbirth. About (3.8%) were exposed during recapping. About (1.9%) were exposed during handling, collection of waste and collision

and carelessness. Other respondents (7.7%) were exposed due to lack of PPE (Figure 1).

#### **Location of occupational exposure among the participants**

Regarding location of exposure, about (28.8 %) had exposure in the surgical room. About (21.2%) had exposure in the emergency room. About (15.4%) of the respondents stated that they became exposed in the dressing room during. Others include (13.5%)-during injection, (9.6%)-labor ward, surgical room and 1.9% were exposed in the laundry room. (Figure 2).

#### **Reasons for not reporting among the participants**

About 9 (33.3%) of the participants did not consider the exposure unserious and as such did not report it. Our study also indicated 7 (25.9%) thought it unserious. About 2 (7.4%) responded that it was a low risk source of exposure. 3(11.1%) did not know where to report (Table 5)

#### **Reportage of occupational exposure among the participants**

Out of the total nurses who participated in this study, 48.1% reported of their exposure while 51.9% did not report their exposure. (Figure 3)

Table 2: Perceived risk for occupational HIV contagion among the participants

| Rating    | Frequency | Percent |
|-----------|-----------|---------|
| Very high | 8         | 15.4    |
| High      | 22        | 42.3    |
| Moderate  | 8         | 15.4    |
| Low       | 12        | 23.1    |
| Very low  | 2         | 3.8     |
| Total     | 52        | 100.0   |

Table 3: Contact with HIV positive patients and HIV testing after occupational exposure among the participants

| Questions                                                          | Yes<br>n(%) | No<br>n(%) | Total<br>n(%) |
|--------------------------------------------------------------------|-------------|------------|---------------|
| Have you received training on prevention of occupational exposure? | 17 (32.7)   | 35(67.3)   | 52(100.0)     |
| Have you attended to anybody that has HIV infection?               | 39 (75.0)   | 13(25.0)   | 52(100.0)     |
| Did you know the person source of HIV status?                      | 20 (38.5)   | 32(61.5)   | 52(100.0)     |
| Did you test for HIV after occupation exposure?                    | 26 (50.0)   | 26(50.0)   | 52(100.0)     |

Table 4: Occupational exposure among the participants in the last 12months

| Occupational exposure                                                                                                                    | Never    | Once     | >once    | Total     |
|------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|-----------|
| Needle stick injury                                                                                                                      | 22(42.3) | 9(17.3)  | 21(40.4) | 52(100.0) |
| Contaminated sharp injury                                                                                                                | 24(46.2) | 18(34.6) | 10(19.2) | 52(100.0) |
| Splashed by blood or any body fluids?                                                                                                    | 16(30.8) | 19(36.5) | 17(32.7) | 52(100.0) |
| Non intact skin exposure (exposed skin that is chapped, abraded or afflicted with dermatitis come into contact with blood or body fluids | 29(55.8) | 14(26.9) | 9(17.3)  | 52(100.0) |
| Human bite injury                                                                                                                        | 39(75.0) | 8 (15.4) | 5(9.6)   | 52(100.0) |

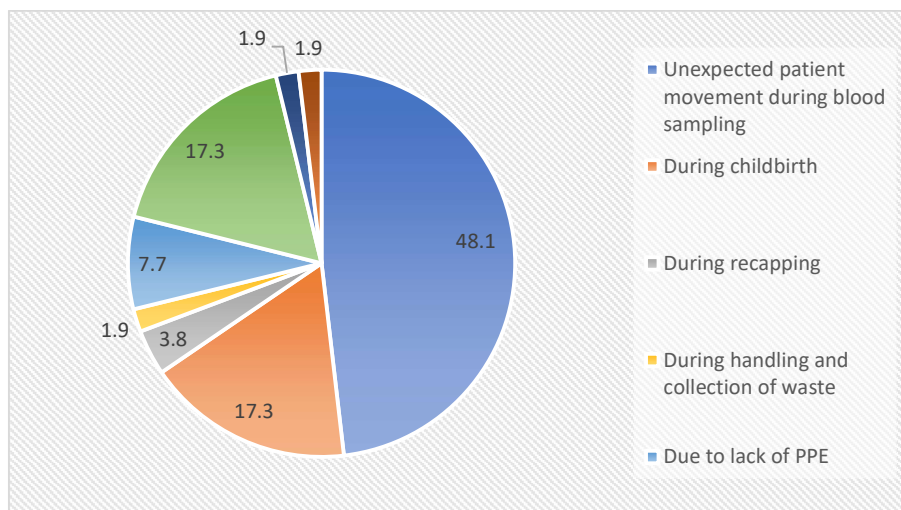


Figure 1: Reasons for occupational exposure among the participants

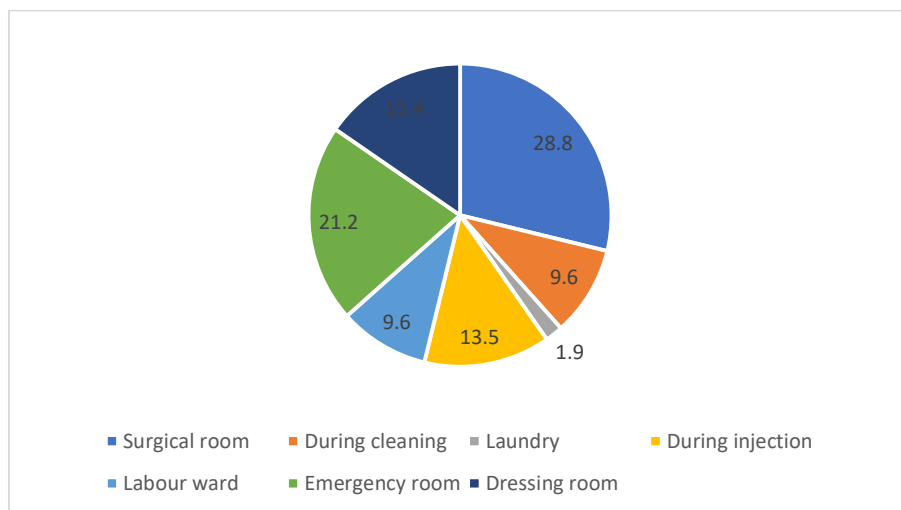


Figure 2: Location of occupational exposure among the participants

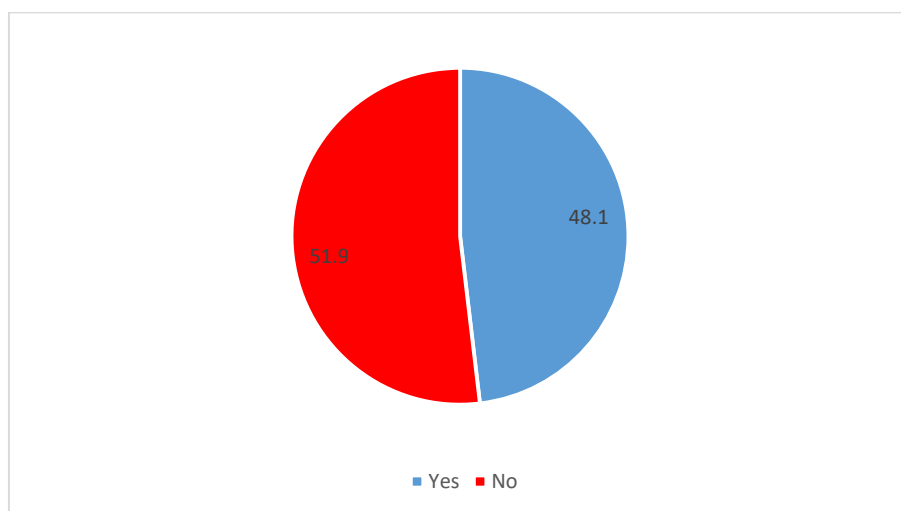


Figure 3: Reportage of occupational exposure among the participants

Table 5: Reasons for not reporting among the participants

| Reasons for not reporting                    | Frequency | Percent |
|----------------------------------------------|-----------|---------|
| Too busy                                     | 1         | 3.7     |
| Considered it, unserious                     | 9         | 33.3    |
| Thought unserious                            | 7         | 25.9    |
| Did not know where to report                 | 3         | 11.1    |
| Safe/low risk considering of source patients | 2         | 7.4     |
| Others                                       | 5         | 18.5    |
| Total                                        | 27        | 100     |

## DISCUSSION

This set to assess the perceived occupational risk of contracting HIV and occupational exposure to blood and body fluids among nurses working Nigerian Correctional Services Medical Centres in Abuja, Nigeria found that more than half (57.7%) of the participants reported that their perceived occupational risk of contracting HIV among the participants was high (42.3 %) and very high (15.4%). This is in tandem with findings of previous studies by Orji et al. (2002), Manyele et al. (2008), Amosun et al. (2011), Tziaferi et al. (2011), Chiou et al. (2013) and Enwere & Diwe (2014). This finding may be related to the fact that about three quarters of participants have attended to HIV positive patients and did undergo testing after occupational exposure.

This study also found a high prevalence of various categories of occupational exposure with splashed by blood or any body fluids leading having affected more than two thirds (69.2%) of the participants. Needlestick and sharps injuries which affected more than half of the participants were the second and third prevalent occupational exposures respectively. The prevalence of needlestick and sharp injuries were comparable to the prevalence reported in Nigeria and other parts of the world (Adejumo & Olatunji, 2014; Isara et al., 2015).

Human bite which affected a quarter of the participants is significant even when is uncommonly studied type of occupational exposures. Tarantola et al. (2003) showed that 7.649 blood and body fluid exposures were reported by health care workers to occupational medicine departments in 61 hospitals. More in detail, nurses and nursing students accounted for 4.587 (60%) of exposures, followed by nurses' aides and clinicians while most (77.6%) of the reports were related to needle stick injury.

The majority (48.1%) of the participants were exposed due to unexpected movement of patient during blood sampling. The non-availability of adequate time of explanation of procedure to ensure optimal relaxation before intervention may have made unexpected movement of patient during blood sampling as the leading reason for

occupational exposure. One in every thirteenth participant experienced occupational exposure due to lack of personal prospective equipment which can be controlled to authorities by improving procurement, distribution and usage to prevent such. A low proportion (3.8%) were exposed during recapping and 1.9% were exposed during handling, collection of waste and collision and carelessness. These may have constituted low reason for occupational exposure possibly because their receipt of training on occupational exposure among about one third (32.4%) of the participants. Although the training may be ascribed to positive, reports showed that more than two-thirds (67.3 %) of the participants have never received training on the prevention of occupational exposure. The finding is consistent with the finding where more than half of health care workers (84/120) had not attended any training on occupational exposure to body fluids in the last three years (Takougang et al 2023; Cheuyem et al., 2023). Training is a major contributor to the observance of standard precautions and other skills. There is a need for the implementation of infection prevention and control interventions in healthcare settings. Short-term training options, including seminars and workshops on hospital infection control are warranted. Naylor et al. (2019) found that 93% of occupational injuries could be reduced by operational training. The pressure to render care speedily, effectively and efficiently in surgical and emergency room may have resulted in prevalence of occupational exposures in these locations. Pressure tilted to errors occurred and About (21.2%) had exposure in the emergency room. More than half (48.1%) of the participants did not report their exposure and it can be ascribed to the fact more than half (59.2%) of the participants neither consider the exposure serious nor thought it serious. Additionally, 7.4% of the participants considered it, a low risk source of exposure while 11.1%) did not know where to report. This therefore, emphasized the need for training of nurses on standard precaution in health services.

## CONCLUSION

Data from this study revealed that the perceived occupational risk of contracting HIV among the participants was high and very high. Evidently reported among the participants were high prevalence of various types of occupational exposure to blood and body fluids. Poor reportage of occupational exposure and non-receipt of training on prevention of occupational exposure. There is a need to provide training for the nurses to prevent and control occupational exposure, promote reportage in the event of occurrence and how to facilitate availability of personal protective equipment at all times for nurses. Further studies among other health workers in Nigerian Correctional Services is recommended.

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## Conflicts of Interest

The authors have declared that no competing interests exist.

## Abbreviations

HAMRC- Henry Akingba Medical and Research Centre

IP- INSPECTOR OF PRISON

SIP-SENIOR INSPECTOR OF PRISON

PIP-PRINCIPAL INSPECTOR OF PRISON

ACIP-ASSISTANT CHIEF INSPECTOR OF PRISON

DCIP-DEPUTY CHIEF INSPECTOR OF PRISON

SOP-SUPERINTENDENT OF PRISON

CSP-CHIEF SUPERINTENDENT OF PRISON

ACP-ASSISTANT CONTROLLER OF PRISON

DCP-DEPUTY CONTROLLER OF PRISON

CP-CONTROLLER OF PRISON

Where C NOW replaces the P, C standing for Corrections

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