VOL. 10 NO. 3,
NOVEMBER, 2025
E-ISSN 3026-8702
P-ISSN 3026-8745

African Scholar Publications & Research International
www.africanscholarpub.com

Journal of Clinical and Metabolism Studies (JCMS)

Assessment of Nurses Knowledge and Awareness of Needle Prick Injury and Adherence to Standard Precautions in Prevention

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DOI: https://doi.org/10.70382/ajcms.v10i3.028

Abstract

Needle prick injuries (NPIs) remain a significant occupational hazard among healthcare workers, particularly nurses who frequently handle sharp instruments. The objectives were to investigate nurse's knowledge, awareness of needle prick injury and adherence to standard precautions in prevention, identify factors influencing compliance with preventive measures, and explore reporting practices while recommending strategies for improvement. A descriptive cross-sectional design was employed, involving nurses across various units of the hospital. Data were collected using a structured, self-administered questionnaire and analyzed using descriptive and inferential statistics. Findings revealed a notable prevalence of needle prick injuries among respondents, with varying levels of knowledge and awareness about risks and prevention. Although most nurses demonstrated awareness of standard precautions, adherence to these practices was inconsistent, largely influenced by workload, availability of protective equipment, and institutional support. Reporting of needle prick injuries was suboptimal due to fear of blame, lack of time, and inadequate reporting systems. The study concludes that while awareness of NPI prevention is relatively high, gaps remain in compliance and reporting. It recommends regular training, strict enforcement of safety protocols, provision of adequate protective materials, and establishment of an effective injury reporting and follow-up system to minimize the

incidence of needle prick injuries among nurses in Lagos State University Teaching Hospital (LASUTH).

Keywords: Needle prick, nurses, hospital, equipment, practice, workload.

Introduction

Most common causes of Needle prick injuries are found to be associated with Recapping used needles improperly, accidental punctures while handling or disposing of sharps , collisions or sudden movements during procedures, improper disposals of sharps in non-designated containers and high workload, stress or fatigue (Suksatan *et al* ; 2022).

Globally, Needle prick injuries (NPI) are a major occupational hazards for healthcare workers worldwide, especially nurses, who are at the highest risk due to frequent exposure to needles and sharps. World Health Organization (WHO) estimates 2 million needle prick injuries occur annually among healthcare workers, leading to over 66,000 cases of Hepatitis B, 16,000 cases of Hepatitis C, and 1000 cases of of HIV. A systemic review found needle prick injury prevalence rates ranging from 20% to 50% annually among nurses, depending on region and hospital safety measures.

Developed countries like USA, UK, and Germany report lower prevalence (around 10%-30%) due to strict safety policies and advanced needle technologies. Developing countries like Nigeria, India and Pakistan shows a higher prevalence (40%-70%) due to lack of training , poor waste disposal and inadequate protective measures , excess workload, insufficient consumables (Obuzor, 2021). In United States, A CDC study found that 385,000 NPI occurs yearly with nurses being the most affected group. In China, A 2020 study reported that 41.2 % of nurses experienced at least one NPI in a year. In Nigeria studies shows that over 60% of nurses have had at least one NPI in their career, with underreporting being a major issue.

Every nurse loves to work in healthy and safe environment that promotes quality of life in every individual. The quality of workplace promotes staff morale to utilize their talents effectively well. This is because unhealthy workplace could expose a nurse to hazards. Even where psychosocial and economic conditions are adequately provided, when accidents occurs, a large number of workers might be affected. Nurses and other health workers are always involve in the care and management of patients in the hospitals. Nurses work at the risk of blood borne infection during their nursing practice every time. Nurses are at a great risk to get infected as an occupational hazard is quiet common with the risk of blood-borne infection transmission through exposure of a percutaneous injury (e.g. needle stick or cut with a sharp instrument), contact with the mucus membranes of the eye or mouth of an infected person, contact with non-intact skin (particularly when the exposed skin is

chapped, abraded, or afflicted with dermatitis), or contact with blood or other potentially infectious body fluids (wang, 2019).

Nurses give injection to patients, handle procedures involving manipulation of sharp objects that may result in needle prick injury (NPI). Nurses who are directly involved in treating and nursing patients face a great risk of acquiring blood-borne infections such as HIV, hepatitis B and C through accidental needle pricks and contamination during their hospital activities (Mengistu, 2020, Riimaadai, 2021, and Yazid, 2023).

The implementation of strict prevention measures after the accident reported in 2013 allows the significant reduction of the number of injuries in 2014. The aim of this research work is to assess nurse's knowledge and awareness of needle prick injury and adherence to standard precautions in prevention.

Research Design

This study adopted a descriptive cross sectional research design to investigate the prevalence and practice of needle prick injury among Nurses in Lagos State University Teaching Hospital Lagos (LASUTH).

Area of Study

The research study was restricted to Health care workers in Lagos State University Teaching Hospital (LASUTH) Ikeja, Lagos State in the South western region of Nigeria. LASUTH is tertiary institution, located at strategically in Ikeja, the State Capital. The hospital was established in 1955, from a small cottage health centre in the western region. It was converted from General Hospital to Teaching Hospital in 2001 and elevated to Teaching Hospital on the 12th November 2015, when the first kidney transplant was performed in the hospital. LASUTH had about 892 nurses and 420 beds. The hospital has all categories of nurses that attend to various kinds of patients and as teaching hospital accepts referral from the general hospital.

Population of the Study

The target population of the study is nurses in University Teaching Hospital, Ikeja. A total population of nurses in LASUTH is 892.

Sample Size

A sample size of nurses for inclusion in the study was determined from the 892 nurses' population. The sample size is statistically determined using the Slovin's formula (Gusen 2017):

$$n = N/1+Ne^2$$

Where

n = maximum sample size

N = Total population

e = Error of tolerance (95% confidence level; p = 0.05)

A total sample size population of 892 participants was selected for the study.

Sampling Techniques

Multi stage sampling technique. For the first stage, stratified sampling technique was used to select the various cadres of nurses in LASUTH by their seniority; into junior and senior categories. Second stage, simple random technique was applied to select the various nurses in their different cadres. The sampling technique to a large extent is a representation of the population characteristics. Each selected cadre is shown in table 1 below using the following formula:

N = X/Y x 892/1 , where

N = Sample size for each stratified cadre of nurses

x= Total population of nurses

y= total population of nurse in five stratified groups

Table 1: Sample Size of Nurses in their Seniority cadres

S/N	Categories of Nurses	Total Population	% of Sample Size	Proportion of Sample Size
1.	DNS	1	0.1	0.001
2.	DDNS	39	4.4	0.044
3.	ADNS	109	12.2	0.122
4.	CNO	121	13.6	0.136
5.	ACNOS	71	8	0.080
6.	PNO	49	5.5	0.055
7.	SNO	193	21.6	0.216
8.	Nursing officer l (NOI)	92	10.3	0.103
9.	Nursing Officer l l(NOll)	190	21.3	0.213
10.	Nursing Officer 111(NO3)	27	3	0.030
	Total	892	100	1

Sample Size Determination Using slovin Formula:

Research Instrument

The instrument for data collection is a questionnaire, which was developed by the researcher. This instrument has four parts, the first part of the questionnaire

addressed the demography variables of the participants, the second part contained items to probe the participants' response on Prevalence of NPIs, the third part is Questions on Causes and Reporting of NPIs among Nurses, the fourth part is on Questions on various interventions employed by nurses in managing injuries in LASUTH Ikeja, Lagos State. There are also 31 items for responses

Method of Data Collection`

The researcher visits the location of the research study, meet the participants, introduce himself and the importance of the importance of the study. The participants receive questionnaires and complete copies is retrieved back.

Data Analysis

The data collected was subsequently collated, analyzed and discussed. Descriptive statistics technique such as the computation of frequency percentage totals and means was used for the analysis Statistical Package for Social Science (SPSS) version 21.

Results and Discussion

Table 2: Prevalence of Needle prick injuries

Variables	Frequency	Percentage
Experienced needle prick injury		
Yes	193	69.9
No	83	30.1
Frequency of needle prick injury in the last one year	**n=193**	
Once	78	40.4
2 – 3 times	72	37.3
> 3 times	43	22.3
Causes of most recent injury		***Multiple response***
During patient care	124	64.2
Recapping needle	89	46.1
During disposal	76	39.4
Others	23	11.9
Types of needle causing the injury		
Hollow bore	142	73.6
Suture needle	45	23.3
Others	6	3.1

Table 3: Adherence to standard precautions

Variables	Frequency	Percentage
Frequency of PPE use		
Always	158	57.2
Sometimes	82	29.7
Rarely	36	13.0
Never	0	0.0
Recapping needle after use		
No	148	53.6
Sometimes	98	35.5

Variables	Frequency	Percentage
Always	30	10.9
Methods of needle disposal		
Needle disposal container	268	97.1
General waste bin	8	2.9
Others	0	0.0
Follow hand hygiene after needle use		
Yes	264	95.7
No	12	4.3
Safety engineered devices are available in unit		
Yes	158	57.2
No	118	42.8

From Table 2, the current study found a high prevalence of NPIs (69.9%), which underscores a significant occupational hazard among nurses. This prevalence is consistent with findings from Nigeria and other African settings. For instance, Kebede and Gerensea (2018) in Ethiopia reported a 62% prevalence among nurses. The fact that most injuries in the present study occurred during patient care (64.2%) and while recapping needles (46.1%) reinforces long-standing concerns that unsafe needle handling practices remain a leading cause of exposure (Mohammed *et al*., 2024). The predominance of hollow-bore needles (73.6%) as the source of injury further heightens concern due to their higher transmission efficiency for blood-borne pathogens such as HBV, HCV, and HIV (Li *et al.*, 2024).

In terms of knowledge and awareness, the study revealed that 92.8% of nurses were aware of occupational risks and 86.2% were knowledgeable about standard precautions, while 71.7% had received formal training. This high level of knowledge is comparable to the 84% awareness reported among nurses in Addis Ababa by Asmr et al. (2019). However, consistent with global findings, high awareness does not always translate into adequate practice (Nwoga *et al*., 2021). Behavioral barriers, lack of supervision, and weak institutional safety culture often mediate this knowledge–practice gap. Similar trends have been observed in Saudi Arabia and Egypt, where nurses demonstrated good theoretical knowledge but suboptimal compliance with safe needle practices due to workload pressures and insufficient reinforcement (Ali & and Eldessouki, 2023; Mohammed *et al.*, 2024).

Regarding practice, the study observed that 57.2% of nurses reported always using personal protective equipment (PPE), and 53.6% avoided recapping used needles. These moderate adherence rates are consistent with earlier reports indicating that PPE compliance among nurses generally ranges between 50–65% in sub-Saharan African hospitals (Ali and Eldessouki, 2023; Mohammed *et al*., 2024). Encouragingly, nearly all respondents (97.1%) disposed of used needles in designated sharps containers, reflecting improved adherence to safe disposal protocols. This mirrors findings by Ali and Eldessouki (2023), who documented a 94% compliance rate in proper sharps disposal. However, only 57.2% of the respondents in

this study reported the availability of safety-engineered devices, suggesting that institutional constraints remain a major limitation. Similar supply-side barriers were emphasized by Mohammed *et al*. (2024), who noted that limited access to engineered safety devices and PPE contributes to persistent exposure risks.

Table 3 Highlights the Factors influencing adherence to preventive practices included the availability of guidelines (69.6%) and regular training (57.2%), which positively impacted compliance. Conversely, barriers such as heavy workload (62%) and inadequate disposal facilities (42%) were highlighted. These findings are supported by Shacho *et al*. (2024) and Mohammed *et a*l. (2024), who observed that excessive workload, inadequate staffing, and lack of proper disposal systems negatively affect compliance with standard precautions. Similarly, Nwoga *et al*. (2021) emphasized that ongoing training and the provision of clear institutional protocols are critical enablers for sustained adherence to needle stick prevention measures.

Conclusion

This study revealed a high prevalence of needle prick injuries (69.9%) among nurses in LASUTH, indicating a significant occupational health concern. Although most nurses demonstrated good knowledge and awareness of NPIs and standard precautions, adherence to safe practices remained moderate, particularly regarding consistent PPE use and avoidance of needle recapping.

Institutional factors such as workload, limited safety devices, and insufficient training were key barriers to compliance. Experience was found to influence adherence positively, suggesting that continued professional training improves safety behavior. However, underreporting of NPIs was common due to fear of blame and weak reporting systems, limiting effective post-exposure management.

To reduce NPI risks, the study recommends regular training, adequate provision of safety materials, non-punitive reporting mechanisms, and stronger institutional supervision. Strengthening these areas will enhance compliance, reduce occupational exposure, and promote a safer working environment for nurses.

Recommendations

Based on the findings of this study, the following recommendations are proposed. Regular and mandatory training sessions on standard precautions, safe injection practices, and post-exposure management should be conducted to reinforce knowledge and improve adherence among nurses. Nursing supervisors should regularly monitor compliance with infection prevention protocols, ensuring that safe practices such as proper sharps disposal and avoidance of needle recapping are strictly followed. LASUTH should incorporate comprehensive needle prick injury prevention strategies into its institutional policies and ensure regular policy review in line with WHO and national infection control standards.

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