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Original Research Article

KNOWLEDGE ATTITUDE AND PRACTICE REGARDING NEEDLE STICK INJURY AMONG NURSES IN THE TERTIARY CARE HOSPITAL OF LAHORE

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Abstract: *A Needle Stick Injury (NSI) occurs when a needle or other sharp object punctures the skin, potentially exposing the individual to blood-borne pathogens. Nurses are highly at risk of getting injured by sharp instruments.* ***Objective:*** *The study aims to assess nurses' knowledge, attitude, and practice regarding NSI and to find the correlation between these three parameters.* ***Methods:*** *This cross-sectional study was conducted at Sir Ganga Ram Hospital Lahore. In this study, 200 working nurses were included. A self-designed validated questionnaire was used. The software SPSS-23 was used to enter and analyze the data. Descriptive analysis was employed for summary statistics. Pearson's correlation coefficient was used to investigate the relationship between variables.* ***Results:*** *Out of 200 nurses, 39 (19.5%) exhibited an experience of needle stick injury. A significant proportion (53.0%) of respondents were familiar with NSI, which causes wounds. Nurses have practices to utilize the hospital's resources to protect themselves from injuries. Significant relationships were found between all three domains ($P<0.05$).* ***Conclusion:*** *Based on these results, it is marked that while nurses possess an upright level of knowledge and show optimistic attitudes toward NSI prevention, to some extent, they require attention and improvement. Specific interventions and educational curricula are desirable to improve knowledge, attitudes, and practices, guaranteeing a better workplace, protecting healthcare personnel, and reducing the hazard of spreading blood-borne pathogens.*

Keywords: Needle Stick Injury, Staff Nurses, Knowledge, Awareness, Pearson Correlation

Introduction

Needle skin injury (NSI) is a piercing or cut wound into the body's crust by a prickle or a high-pitched object/instrument in which the needle was polluted with some other person's blood, tissue, or other person's fluids. NSI is known as an occupational health hazard among millions of healthcare workers. A WHO report revealed that 3 million health workers/professionals annually experience NSI worldwide. (1), a large proportion of nurses experience NSI. In India, the incidence of NSI in Nurses is about 31% among all needle stick injuries in health care workers (2,3). Most needle stick injuries have been found among nurses, surgeons, emergency medical technicians, surgery technologies, and laboratory technicians. Needle stick injuries do not occur with the same frequency among healthcare professionals. This type of injury has also been found in housekeeping workers and individuals who manage and clean sharp containers (3). NSI is not only restricted to hospital settings as it occurs in other healthcare settings like private clinics, outpatient surgery, OPD, day surgery, exigent care centers, nursing care homes, and cosmetic surgery clinics (4).

NSI has many effects on healthcare professionals. Despite many approaches and protocols, the injuries are yet noticeable(2). The frequency of sharp injuries is decreasing but still not completely prevented (5). Although the key effect of NSI is infection with severe diseases, it also has a humanistic load, economic problems, clinical burden, etc. After injury, healthcare workers feel psychological effects like anxiety, stress, and depression. Not only the psychological outcome and physical effect but also the economic liability after NSI is also high(6). Nurses are at high risk of NSI from syringes and intravenous (IV) equipment relative to other healthcare workers(7).

Research on needle stick injuries is crucial due to its implications for health, safety, and occupational well-being(8). The scope of the study is to find the incidence of NSI, prevention and safety measures for nursing and health care staff, reduce the psychological impact of NSI, educate and raise awareness about NSI, and make a framework for policies and guidelines for staff. Studies on NSI can contribute to more effective prevention strategies, improved safety measures, and better support for those affected by needle stick injuries(9). The objectives of this study are to assess nurses' knowledge, attitude, and practice regarding NSI and to find the correlation between these three parameters.

Methodology

It was a cross-sectional observational study in Sir Ganga Ram Hospital Lahore from May 2024 to August 2024. It was designed to assess the knowledge, practice, and attitude (KAP) regarding needle stick injury among nurses. A cross-

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sectional observational study design is functional when we need to know the current status of any phenomenon. A cross-sectional design can be instrumental in NSI research for several reasons, such as a Snapshot of Current Conditions, Descriptive Analysis, and immediate results (10). The study population consisted of registered nurses working in various departments, such as intensive care units, cancer management, neurosurgery, cardiac surgery, burn, and advanced neonatology wards. The estimated number of nurses was 400 when the study was being conducted as a small number of nurses were on leave or assigned other duties; Yamane's (1967) formula was used to calculate the sample size, and the sample size for this study was 200(11). The inclusion criteria were the registered nurse with education BSN or Post RN with at least 2 years of working experience in the ward above. Those who were not willing to participate or were on leave were excluded.

A Self-designed questionnaire was used to collect the data; the questionnaire was composed of knowledge- and practice-based questions. The questionnaire was self-designed and was reviewed and validated by the supervisor. The questionnaire contained demographics of nurses, such as age and experience. Three domains of the questionnaire were knowledge, attitude, and practice. Each domain includes five questions. The knowledge domain contained questions on needle stick injury; the attitude domain contained questions regarding the perception of needle stick injury, and the third domain, the practice, was based on practical exposure to needle stick injury. The questionnaire was based on a five-point Likert scale (coded as 1 to 5). Likert scale is an ordinal scale. A statistical tool, Cronbach Alpha, was used to measure the reliability of the questionnaire. That was 76 %, which is considered a good reliability of any instrument (questionnaire). The ethical declaration was obtained from the departmental committee. Informed consent was taken from participants after the briefing on the study topic. The average time to complete the questionnaire was 10-15 minutes.

A simple random sampling technique was used to select the study participants; simple random sampling is considered more reliable when the study population is small and well-defined. After collecting questionnaires from the participants, the questionnaires were thoroughly reviewed to avoid errors or missing information. Once the data was collected, it was coded and entered into the statistical software package (IBM-SPSS, version 23) for Windows (SPSS Inc. Chicago, IL, USA). Descriptive statistics, including frequencies and percentages, were calculated for categorical data. Continuous data was expressed as Mean ± SD. Cronbach Alpha was used to test the reliability of the questionnaire. The Pearson correlation coefficient was also used to find the relationship. A p-value < 0.05 (5%) was considered as statistical significance.

Results

The findings of this study are presented in tabular and graphical format. Since the frequencies and percentages mainly assisted in understanding and explaining the KAP study results, the results are expressed accordingly.

Table 1 provides an overview of the demographic characteristics of the 200 study participants. Most participants were over 30 years 112 (56.0%). About half of the nurses reported having more than 10 years of work experience 104(52.0%). A significant proportion held a Post RN degree 133 (66.5%). Nearly all participants were familiar with good knowledge about needle-stick injuries (NSI). Many nurses consistently wore gloves when handling needles. Lastly, 19.5% (n=39) of participants experienced a needle-stick injury in the previous years.

Table 2 indicates that most nurses exhibited good awareness regarding NSI and related infections. A significant proportion (53.0%) of respondents were familiar with NSI-caused wounds. Nurses (57.5%) are well aware the factors responsible for NSI are recapping needles and bending needles. However, there were variations in recapping syringes after performing interventions. About 57% know how to wear double gloves during the procedure. More than 90% of nurses agreed to report to authority after injury.

Table 3 reveals nurses' attitudes toward needle-stick injuries (NSI). Most respondents (58%) expressed concerns about being worried about NSI. 58% of nurses showed their attitude towards activities regarding NSI education. More than 90% thought the injuries should be immediately reported. The majority had an attitude toward taking HCB vaccinations. The majority (more than 90%) agreed to follow SOPs regarding NSI.

Table 4 shows the practices regarding NSI of 39 nurses (19.5%) who experienced needle-stick injuries (NSIs) with contaminated needles. The majority of nurses disagreed with wearing gloves as mandatory, almost 50%; mostly, nurses (nearly 95%) used yellow plastic safety boxes to destroy needles; nurses have practices utilizing the resources that the hospitals provided to protect themselves from injuries, specially NSI, and mostly had practice to report NSI immediacy after experience. More than 90% of the information regarding NSI was up-to-date from seniors, journals, and social media platforms. These results highlight the extent of enhancement in consistent observance of appropriate practices following NSIs.

The relationship between all three parameters was found using Pearson's correlation coefficient. The mean knowledge score among nurses was 21.03±2.06, the mean score for attitude was 20.10±2.99, and the practice score was 20.29±2.69. The mean scores of all three parameters showed good consistency among nurses. A significant positive correlation was found between scores of knowledge and attitude (R=0.471, p-value<.001), knowledge and practice (R=0.492, p-value <.001), and attitude and practice (R=0.449, p-value<.001).

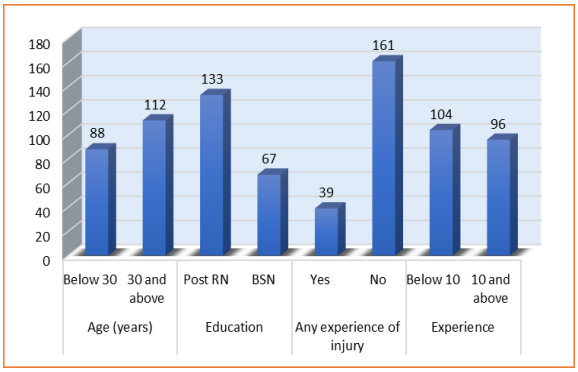

Fig 1: Demographics of participant

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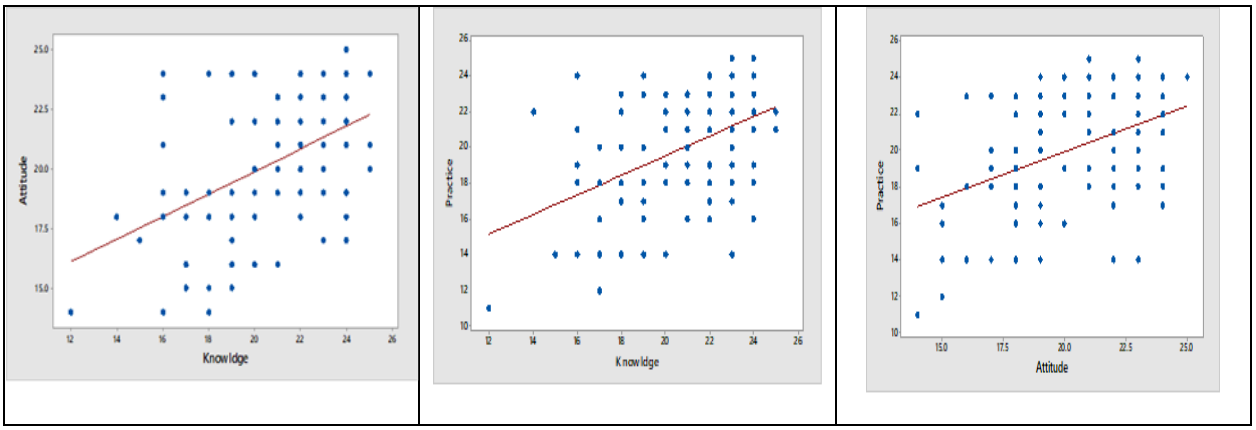

Figure 2: scatter plot of correlations

Table 1: Demographics of respondents

Characteristics	Level	Frequency	Percentages (%)
Age (years)	Below 30	88	44.0%
	30 and above	112	56.0%
Education	Post RN	133	66.5%
	BSN	67	33.5%
Any experience of injury	Yes	39	19.5%
	No	161	80.5%
Experience	Below 10	104	52.0%
	10 and above	96	48.0%

Table 2: Knowledge of NSI among nurses

Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Needle stick injury (NSI) causes wounds caused by needles that accidentally puncture the skin.	76 (38%)	106 (53%)	8 (4%)	7 (3.5%)	3 (1.5%)
The factors responsible for NSI are recapping needles, bending needles, and handling sharps during use.	115 (57.5%)	65(32.5%)	12 (6%)	3(1.5%)	5(2.5%)
Recapping of the syringe after performing nursing interventions is recommended to decrease the risk of needle stick injury.	30 (15%)	36 (18%)	11(5.5%)	75(37.5%)	48 (24%)
Double gloves are worn during the phlebotomy procedure.	68(34%)	114(57%)	6(3%)	10(5%)	2(1%)
Reporting every needle stick injury must be informed to an authority/hospital management.	93(46.5%)	90(45%)	4(2%)	7(3.5%)	6(3%)

Table 3: Attitude about NSI among nurses

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Having a needle stick injury is something to be worried about.	72 (41%)	116(58%)	8 (4%)	2 (1%)	2 (1%)
Everyone should participate in activities that are being educated about NSI infections.	116 (58%)	65(32.5%)	13 (6.5%)	3(1.5%)	3(1.5%)
All sharps injuries at work should be reported immediately.	88(44%)	106(53%)	2(1%)	2(1%)	2(1%)
I think Hepatitis B vaccination should be taken.	86(43%)	102(51%)	4(2%)	2(1%)	6(3%)
Needles should be disposed of as per SOPs immediately after use.	105(52.5%)	85(42.5%)	4(2%)	3(1.5%)	3(1.5%)

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Table 4: Practice about NSI among nurses

Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Donning gloves is mandatory when dealing with needles or sharp-edged objects.	30 (15%)	36 (18%)	11(5.5%)	75(37.5%)	48 (24%)
Used needles should be placed in a yellow plastic safety box immediately after use.	105(52.5%)	85(42.5%)	4(2%)	3(1.5%)	3(1.5%)
Utilize available resources provided by hospital management to protect from NSI.	88(44%)	106(53%)	2(1%)	2(1%)	2(1%)
Needle Stick Injury must be reported immediately to the supervisor if it happens.	116 (58%)	65(32.5%)	13 (6.5%)	3(1.5%)	3(1.5%)
Up-to-date information should be shared with staff and colleagues about needle stick injuries.	72 (41%)	116(58%)	8 (4%)	2 (1%)	2 (1%)

Discussion

In this study, out of 200 nurses, 39 nurses had experienced NSIs, primarily using injections. Most cases happened in hospital settings, unlike other data where blood-taking processes were the key cause. (12). NSI proportion was lower in this study (19.5%) compared to NSI nurses in a clinical setting of Ethiopia (34.5%) (13), in Amman, Jordan (36.7%) (14) and Jordan (26.2%) (15). In observance of hospital rules, all affected nurses in this study meticulously reported NSI incidents to their seniors. This study's results dissimilar with (16), who described that only 34% of NSI incidents were informed to authorities. Moving forward, there is a demanding requisite to improve NSI preventive working, as merely 44% of nurses are informed about using gloves, and mostly continuously to recap the sharp objects and needles. Needle recapping, careless needle use, and ignoring of gloving practice are substantial contributing issues to work-related coincidences, but targeted interventions can efficiently lessen the prospect of future NSIs (17). Furthermore, failure to attire gloves upsurges the danger of contracting BBPs (bloodborne pathogens), predominantly HBV, which can contaminate many of its hosts and remain workable in waterless blood for 7 days (18). The study findings showed that most staff nurses in the medical ward had a better knowledge of NSIs and their preventive measures. A tiny fraction of staff nurses were known as demanding improvement in expertise, pointing out that the general knowledge level of the nursing inhabitants was pretty good. This proposes that nurses in the study had a solid knowledge of NSI prevention (19). Nurses are familiar with the prerequisites for direct viral lab testing with HCV (RNA), which uses PCR viral load at 6 weeks and HCV antibody testing every 5 months. This exhibits a realistic knowledge level in nurses relating the suggested testing measures for Hepatitis C infections (20). The results of this paper are more favorable compared to the outcomes of research conducted by (21) Seven hundred eighty-six healthcare professionals in Abha City, KSA, it was shown that about 58.5% of the people told us the timing of the Hepatitis C virus antibody testing. One significant observation is that a considerable proportion of nurses expressed apprehensions about facing NSIs, as showed by the high proportion of subjects agreeing or strongly agreeing with the statement about having an NSI. This finding is similar to previous studies by (22)Healthcare professionals, including staff nurses, also described an optimistic approach towards NSI incidents. The resemblance in results suggests a common awareness among healthcare individuals regarding the possible dangers, dreads and concerns related to NSIs (23). Moreover, nurses' approaches regarding sharps disposal practices exposed a significant insight. Many nurses worried about the frequency of changing sharps and discarding basins, with a substantial proportion agreeing to change containers frequently. Regarding glove-wearing practice during needle handling processes, a significant percentage of nurses regularly attire gloves, which is desirable in preventing NSIs and dropping the risk of blood-borne pathogen exposure(17). However, a limited quantity of nurses reported irregular glove-wearing, indicating the requirement for improvement. Previous studies have emphasized the significance of constant glove usage among healthcare workers.(13), highlighting the need for regular education and awareness workshops to promote the observance of suitable glove usage protocols. Moreover, a high percentage of nurses punctually discarded unclean needles after use, reducing the danger of unintentional NSIs and BBP transmission (17). This exercise is aligned with recommended procedures for NSI prevention. However, in this regard, a small percentage of nurses conveyed NSI occurrences/events to their administrators, hypothetically delaying their approaches to suitable treatment (16). A positive and significant relationship was observed in all three parameters, which is similar to another study.

Conclusion

This research is intended to measure the knowledge, attitudes, and practices of working nurses regarding NSIs in clinical settings. These results show that while nurses possess an upright level of expertise and show optimistic attitudes regarding NSI prevention, to some extent, require attention and improvement. Specific interventions and educational curricula are desirable to improve knowledge, attitudes, and practices, guaranteeing a better workplace, protecting healthcare personnel, and reducing the hazard of blood-borne pathogens spreading.

Declarations

Data Availability statement

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All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-TCFJMU-009232/23)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

SAIMA AKRAM (Charge Nurse)
Research idea, Literature review.
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Data collection and data analysis
NIDA-UL-NASAR
Methodology and study design .
MISBAH NAZ
Manuscript writing
NAILA MAQBOOL
Manuscript revision

References

1. Al-Khalidi GZS, Nasir NA. Knowledge, Attitude, and Practice Regarding Needle Stick Injuries Among Health Care Workers in Baghdad Teaching Hospital and Ghazy Al-Hariri Hospital for Surgical Specialties in 2020. Open Access Maced J Med Sci . 2022 Jul 2;10(E SE-Public Health Disease Control):1–7.
2. Tawiah PA, Appiah-Brempong E, Okyere P, Ashinyo ME. Exposure to needlestick injury among healthcare support staff in Greater Accra, Ghana: a cross-sectional study. BMJ Public Heal. 2024;2(1):e000681.
3. Kandeel A. Needle stick and sharp injuries (NSSIs) among housekeepers in a Saudi hospital : An intervention study. IjicInfo [Internet]. 1996;13:1–7. Available from: http://www.ijic.info/article/view/17329
4. King KC, Strony R. Needlestick. In Treasure Island (FL); 2024.
5. Cheetham S, Ngo HT, Liira J, Liira H. Education and training for preventing sharps injuries and splash exposures in healthcare workers. Cochrane Database Syst Rev. 2021 Apr;4(4): CD012060.
6. Cooke CE, Stephens JM. The clinical, economic, and humanistic burden of needlestick injuries in healthcare workers. Med Devices (Auckl). 2017;10:225–35.
7. Mengistu DA, Tolera S, Demmu Y. Worldwide Prevalence of Occupational Exposure to Needle Stick Injury among Healthcare Workers: A Systematic Review and Meta-Analysis. Can J Infect Dis Med Microbiol. 2021 Jan 29;2021:1–10.
8. Sardesai R V, Gaurkar SP, Sardesai VR, Sardesai V V. Awareness of needle-stick injuries among health-care workers in a tertiary health-care center. Indian J Sex Transm Dis AIDS. 2018;39(2):107–10.
9. Handiyani H, Meily Kurniawidjaja L, Irawaty D, Damayanti R. The effective needle stick injury prevention strategies for nursing students in the clinical settings: a literature review. Enferm Clin [Internet]. 2018;28:167–71. Available from: http://dx.doi.org/10.1016/S1130-8621(18)30060-3
10. Setia MS. Methodology Series Module 3: Cross-sectional Studies. Indian J Dermatol. 2016;61(3):261–4.
11. Oakland GB. Determining Sample Size. Can Entomol. 1953;85(3):108–13.
12. Sharma R, Rasania S, Verma A, Singh S. Study of Prevalence and Response to Needle Stick Injuries among Health Care Workers in a Tertiary Care Hospital in Delhi, India. Indian J community Med Off Publ Indian Assoc Prev Soc Med. 2010 Jan;35(1):74–7.
13. Kebede A, Gerensea H. Prevalence of needle stick injury and its associated factors among nurses working in Dessie town, Northeast Ethiopia public hospitals, 2016. BMC Res Notes. 2018 Jun;11(1):413.
14. Fadil RA, Abdelmutalab NA, Abdelhafeez SA, Mazi W, Algamdi S, Shelwy MM, et al. Pattern and risk factors of sharp object injuries among health care workers in two tertiary hospitals, Al Taif-Kingdom of Saudi Arabia 2016-2018. Saudi J Biol Sci. 2021 Nov;28(11):6582–5.
15. Suliman M, Al Qadire M, Alazzam M, Aloush S, Alsaraireh A, Alsaraireh FA. Students nurses' knowledge and prevalence of Needle Stick Injury in Jordan. Nurse Educ Today. 2018 Jan;60:23–7.
16. Dafaalla MD, Kheir AEM, Hashim A, Mohammed N, Mirghani M, Haroon M, et al. Knowledge, attitude, and practice towards needle stick injury among health care workers in a tertiary Sudanese hospital. 2016;3(1):1–9.
17. National Institute for Occupational Safety and Health (NIOSH). The NIOSH occupational exposure banding process for chemical risk management. Niosh [Internet]. 2019; Available from: https://www.cdc.gov/niosh/docs/2019-132/
18. Bezerra DF, Franklin Junior W, Spotorno P, de Almeida Rocha Barreira C. Molluscan assemblages on artificial structures: a bioinvasion perspective from Northeast Brazilian ports. Aquat Invasions. 2022;17(4):494–515.
19. Bhargava A, Mishra B, Thakur A, Dogra V, Loomba P, Gupta S. Assessment of knowledge, attitude, and practices among healthcare workers in a tertiary care hospital on needle stick injury. Int J Health Care Qual Assur. 2013;26(6):549–58.
20. Amare Z, Sheng W, Hussien A, a D. Assessment Of Knowledge, Attribution And Practice Related To Nsis And Blood Exposure Among Health Care Workers In The Armed Forces Referral And Teaching Hospital, Addis Ababa, Ethiopia. Int J Adv Res. 2018 Apr 30;6:110–9.
21. Al-Mugheed K, Farghaly SM, Baghdadi NA, Oweidat I, Alzoubi MM. Incidence, knowledge, attitude, and practice toward needle stick injury among nursing students in Saudi Arabia. Front public Heal. 2023;11:1160680.
22. Mahmood NHN, Hamzah NF. Factors influencing sharp injury reporting among healthcare workers in Hospital Melaka. In 2017. Available from: https://api.semanticscholar.org/CorpusID:201180246
23. Abuduxike G, Aşut Ö, Vaizoğlu SA, Cali S. Health-seeking behaviors and its determinants: A facility-based cross-sectional study in the Turkish republic of

northern Cyprus. Int J Heal Policy Manag [Internet]. 2020;9(6):240–9. Available from: https://doi.org/10.15171/ijhpm.2019.106.