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Original Research Article

Knowledge, attitude and practices regarding needle stick injury among medical and nursing interns in a tertiary care hospital in India

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ABSTRACT

Background: Needle stick injury (NSI) is one of the most potential hazards for health care workers. They pose a significant risk of occupational transmission of blood borne pathogens. This study was conducted with the objectives to assess the knowledge, attitude and practices regarding needle-stick Injury among medical and nursing interns in a tertiary care hospital.
Methods: A total of 218 medical and nursing interns were invited to participate in the study and a predesigned, self-structured questionnaire was distributed amongst them.
Results: A total of 216 participants completed the questionnaire. Knowledge regarding diseases transmitted through needle stick injuries was high in both the groups (>97%). Nursing interns were significantly more likely to perceive consistent adherence to safety protocols in their departments compared to medical interns (p=0.04). Nursing interns experienced a significantly higher proportion of needle stick injuries in the preceding year compared to interns (p=0.03). Reporting of NSIs was also significantly higher among nursing interns (p=0.04).
Conclusions: No significant knowledge gap was identified between medical and nursing interns. Nursing interns, however, observed better safety protocols. Despite sharing the same environment, nursing interns reported a higher incidence of needle stick injuries within the preceding year.

Keywords: Interns, KAP, Needle-stick injury, PEP

INTRODUCTION

NSI are injuries that unintentionally puncture the skin. It is a major occupational hazard faced by healthcare workers (HCW) worldwide. It includes injuries caused by sharp objects, such as blood collection needles, hypodermic needles, intravenous (IV) cannulas and needles used to connect parts of IV delivery systems. These incidents can transmit many blood-borne infectious diseases, especially viruses, notably hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV).[1] Generally, NSI cause only minor bleeding or visible trauma. However, even in the absence of bleeding, the risk of viral infection remains. As per the WHO, NSIs are a major contributing factor for the global burden of HBV (37%), HCV (39%) and HIV/AIDS (4.4%) with transmissions often attributed to multiple reasons such as fatigue, carelessness, haste and sudden movement of patients.[2]

Developing countries like India face a heightened risk of NSIs driven by the hospital congestion, high patient-to-HCW ratio, inadequate awareness and suboptimal adherence to infection control protocols.[3] Needle stick injuries are unsafe and common events among HCWs in their working environment. The lack of knowledge,

coupled with a failure of compliance to personal protective equipment, contributes to increasing incidence of NSI among HCWs. Workplace stress may also put HCWs at increased risk for NSIs.[4] Despite their seriousness as a medical event, occupational hazards have been neglected and often unreported. Therefore, a low injury rate does not necessarily indicate a less significant problem.

As training professionals, interns frequently engage in unsupervised patient encounters and occasionally handle stressful situations, which may account for the increased incidence of NSIs.

The study was undertaken with the primary objective to assess the level of knowledge regarding needle stick injury. The study also sought to assess the attitude and practices regarding the same in the participants.

METHODS

Study design

This was a cross-sectional analytical study conducted among the medical interns and nursing interns at Government Medical College, Srinagar to assess the knowledge, attitude and practice regarding Needle Stick Injury. The study was conducted over a duration of two months from May 2025 to July 2025. One month was used for data collection and one month for analysis.

Study population and sampling

All medical and nursing interns currently enrolled at the institution during the study period were eligible. Interns who declined participation or did not complete the questionnaire were excluded. Sample size was calculated using Cochran's formula:

n= (Z^2 p(1-p))/d^2

where Z is the Z score at 95% confidence interval, p is the estimated proportion of good knowledge and d is the margin of error. Considering a knowledge level of 50% 5, a confidence interval of 95%, a margin of error of 7% and an expected dropout rate of 10%, the final sample size required was calculated to be 218. A total of 216 participants completed the study, including 108 medical interns and 108 nursing interns.

Data collection

A predesigned, semi-structured, self-administered questionnaire covering baseline demographics and NSI-related knowledge, attitudes and practice, was used. The questionnaire was pretested on a small group of interns (not included in the final sample) to ensure clarity and comprehensibility. The questionnaire was shared among the participants via Google Forms and all responses were anonymized.

Qualitative data collection and analysis

Qualitative data was collected using open-ended questions. Participants' responses were reviewed repeatedly to achieve familiarity. Recurring ideas related to needle stick injuries were assigned manually generated initial codes. Similar codes were grouped to subthemes, which were then organized into overarching themes (Appendix A).

Statistical analysis

Data were entered into Microsoft Excel and analysed using IBM SPSS Statistics (Version 23). Descriptive statistics, including frequencies and percentages, were calculated. Comparisons between medical and nursing interns were made using the Chi-square test for categorical variables. A p value of <0.05 was considered statistically significant.

RESULTS

Out of the 216 students,108 (50%) were medical interns and 108 (50%) were nursing interns. 45.8% were males and 54.2% were females as shown in Table 1, 55.1% had an experience of <1 year. Knowledge regarding diseases transmitted through needle stick injuries was high in both groups (>97%). However, medical interns demonstrated significantly better comprehensive knowledge of major blood-borne pathogens (p<0.01), while Nursing interns showed significantly higher awareness of institutional NSI management protocols (p<0.01) as shown in Table 2.

Table 3 shows that the attitude toward NSI prevention was uniformly positive across both cadres. Nursing interns were significantly more likely to perceive consistent adherence to safety protocols in their departments compared to medical interns (p=0.04). As shown in Table 4, preventive practices varied between the two groups.

Nursing interns reported significantly higher avoidance of needle recapping (p<0.01), whereas interns more frequently reported use of disposable syringes (p=0.01). Use of safety-engineered devices remained low across both groups. Nursing interns experienced a significantly higher proportion of needle stick injuries in the preceding year compared to interns (p=0.03). Reporting of NSIs was also significantly higher among Nursing interns (p=0.04), although overall reporting rates remained suboptimal as shown in Table 5. Nursing interns demonstrated significantly better hepatitis B vaccination coverage and training exposure compared to medical interns (p<0.05). More than two-thirds of interns reported never receiving formal training on NSI prevention, highlighting a critical training gap as shown in Table 6. Qualitative findings on prevention of needle stick injuries. Analysis of responses to open-ended questions revealed two major themes regarding the prevention of needle stick injuries among nursing and medical interns.

Theme 1: Continuous education and training

Participants emphasized the importance of regular educational activities, including seminars, workshops and practical demonstrations. Respondents indicated that theoretical knowledge alone was insufficient and highlighted the need for hands-on training and periodic refresher sessions to improve awareness and compliance with NSI prevention practices.

Theme 2: Institutional safety protocols and devices

Another prominent theme related to the need for strict adherence to institutional safety protocols and the availability of safety-engineered devices. Participants stressed the importance of observing proper protocols, consistent enforcement and the use of safety needles and protective devices to minimize the risk of needle stick injuries. Representative verbatim responses supporting these themes are presented in Appendix A.

Table 1: Socio-demographic characteristics of participants.

Characteristic	Interns (n=108)	Nursing interns (n=108)	Total, N (%)
Gender			
Male	60	39	99 (45.8)
Female	48	69	117 (54.2)
Age group (in years)			
20–29	108	108	216 (100)
Years of experience			
<1	60	59	119 (55.1)
1–5	48	49	97 (44.9)

Table 2: Comparison of knowledge variables among interns and nursing interns.

Knowledge indicator	Interns, N (%)	Nursing interns, N (%)	P value
Awareness of NSI-transmitted diseases	97.2	98.1	>0.05
Identification of ≥3 major diseases (HBV, HCV, HIV)	59.3	34.3	<0.01
Awareness of universal precautions	88.9	95.4	>0.05
Awareness of hospital NSI protocol	63.9	83.3	<0.01

Table 3: Comparison of attitude toward needle stick injuries prevention among interns and nursing interns.

Attitude variable	Interns, N (%)	Nursing interns, N (%)	P value
Safety protocols considered "very important"	95.4	99.1	>0.05
Belief that protocols are consistently followed	52.8	65.7	0.04
Perceived need for more NSI training	92.6	88.9	>0.05

Table 4: Comparison of preventive practices.

Practice	Interns, N (%)	Nursing interns, N (%)	P value
Proper disposal in puncture-proof containers	44.4	43.5	>0.05
Avoidance of needle recapping	17.6	33.3	<0.01
Use of disposable syringes	25.9	11.1	0.01
Use of safety-engineered devices	9.3	7.4	>0.05

Table 5: Comparison of needle stick injuries occurrence and reporting.

Variable	Interns, N (%)	Nursing interns, N (%)	P value
Experienced NSI in past year	38.9	50.0	0.03
Reported NSI to authority	24.1	35.2	0.04
NSI not reported	40.7	39.8	>0.05

Table 6: Comparison of post-exposure management, vaccination and training.

Variable	Interns, N (%)	Nursing interns, N (%)	P value
Completely vaccinated against Hepatitis B	15.7	27.8	0.02
Received PEP after NSI	15.7	19.4	>0.05
Ever received formal NSI training	25.5	53.8	<0.001
Never attended NSI training	69.4	47.1	<0.01

DISCUSSION

The present study evaluated knowledge, attitude and practices (KAP) regarding NSIs among medical and nursing interns in a tertiary care hospital, complemented by qualitative insights into perceived prevention strategies. Overall, knowledge regarding diseases transmitted through NSIs was high in both groups. The risk of getting Hep B, Hep C and HIV from NSI was well known amongst doctors and nurses in the study conducted by Zafar et al, while in present study the knowledge was about 59.3% and 34.3% among interns and nurses respectively, suggesting a gap in NSI knowledge among healthcare interns.[6] The differences between groups may reflect variations in curricular exposure, clinical responsibilities and orientation programs. Despite a lower knowledge related to NSI-transmitted diseases, nursing interns were significantly more likely to perceive consistent adherence to safety protocols in their departments compared to medical interns.

A knowledge-gap was also observed in another study, where 32.76% were aware about the universal precaution and 28.16% knew the hazards of syringe recapping.[7] Knowledge of proper disposal of needles as per BMW guidelines was less among both the groups in this study. This may be owing to lack of training on proper biomedical waste management during the orientation or pre internship classes.

Nursing interns (33%) reported higher avoidance of needle recapping ($p<0.01$), whereas medical interns reported a more frequent use of disposable syringes ($p=0.01$). These differences may reflect departmental supervision, habitual nursing protocols or variations in procedural exposure. Qualitative responses by interns emphasized the need for training and refresher workshops to translate knowledge into practice, highlighting persistent gaps in adherence to safe practices. Previous studies have reported wide variation in needle recapping behaviors, with 35.5% of participants recapping used needles in the study by Kiran et al and 73.8% in the study by Madhavan et al.[8,9] These findings emphasize the need for targeted training to reduce occupational risk and promote safe practices among interns.

Nursing interns (50%) experienced a significantly higher proportion of needle stick injuries in the preceding year compared to interns. A study conducted in a tertiary care hospital in Delhi among resident doctors, interns, nurses and technicians revealed that 79.5% of them had an NSI at some point in their career.10 In another study by Kanani et al, prevalence of NSI amongst PG residents was high (72%) compared to other HCWs.[11] Collectively, these studies indicate the vulnerability of healthcare workers, including interns and residents, to occupational exposures. In the present study, only 24% of medical interns and 35.2% nursing interns knew the correct authority to report a needle stick injury. These rates are comparable to those reported by Vijay et al where 32.5% documented the incident.[4] This highlights that despite significant exposure, interns' awareness of reporting procedures remains limited, which may hinder timely management of occupational injuries. Strengthening education on reporting protocols and establishing clear institutional guidelines are therefore essential to improve adherence and ensure prompt intervention following needle stick injuries.

Vaccination coverage differed significantly between groups, with nursing interns demonstrating higher Hepatitis B vaccination coverage and greater exposure to relevant training than medical interns, with 27.8% versus 15.7% fully vaccinated and 53.8% versus 25.5% having received formal NSI training ($p<0.05$). Despite these differences, overall coverage and training remain low, leaving many interns inadequately protected. In a study conducted by Bhat et al 50.9% of the health care workers were fully immunized against hepatitis B.[12] This necessitates systematic NSI training and preclinical immunization programs.

Integrating quantitative and qualitative findings suggests that prevention of needle stick injuries requires multifaceted interventions. Traditional lectures alone are unlikely to produce sustained behavior change. Embedding structured training, supervision and safety practices into departmental culture, supported by regular feedback and reporting systems, may improve compliance and reduce NSI incidence.

Limitations

This study has several limitations. Being a cross-sectional survey, it provides only a snapshot of knowledge, attitudes and practices among interns and causality between variables cannot be inferred. Participants' responses were self-reported, which may introduce recall bias or social desirability bias, potentially leading to overestimation of safe practices. The study was conducted at a single institution with a sample size of 216 participants, which, while adequate for internal analysis, may limit generalizability to other healthcare settings or regions.

Additionally, some variables, such as departmental workload or frequency of clinical exposure, were not measured and may have influenced adherence to safety protocols. Finally, the study assessed knowledge and practices at a single point in time and did not evaluate their long-term retention or behavioral changes. These aspects could be explored in future research.

CONCLUSION

Medical and nursing interns had similar knowledge of NSIs, though nursing interns followed safety protocols more closely. Despite this, 50% of nursing interns reported NSIs in the past year, highlighting a high

prevalence of injuries among healthcare workers, likely due to heavy clinical workloads. A knowledge-practice gap persists despite adequate awareness of NSI risks and protocols. Institutions should go beyond routine training by implementing simplified, supportive NSI reporting systems. Regular workshops, seminars and hands-on training, alongside proper safety devices and mandatory Hepatitis B immunization, are recommended to reduce NSI risk and improve adherence to safety practices.

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REFERENCES

1. Alfulayw KH, Al-Otaibi ST, Alqahtani HA. Factors associated with needlestick injuries among healthcare workers: implications for prevention. BMC Health Serv Res. 2021;21:1074.
2. Rapiti E, Prüss-Üstün A, Hutin YJ. Sharps injuries: assessing the burden of disease from sharps injuries to health-care workers at national and local levels. 2005. Available at: https://www.who.int/publications. Accessed on 12 September 2025.
3. Sain S, Ramasamy N, Verma I, Tripathy JP, Narang U, Kumbhalkar S, et al. Knowledge, attitudes and practices of nurses regarding needle stick injuries, hiv and hepatitis b prevention in a tertiary care center in nagpur, india: a cross-sectional study. Cureus. 2025;17(7):87160.
4. Vijay C, Joe A, Ramesh N. Knowledge of needle sticks injuries and its prevention among interns and post graduate students working at a tertiary health care centre, Bangalore. Int J Comm Med Publ Heal. 2017;4(7):2443–8.
5. Alsabaani A, Alqahtani NS, Alqahtani SS, Al-Lugbi JH. Incidence, knowledge, attitude and practice toward needle stick injury among health care workers in Abha City, Saudi Arabia. Front Publ Heal. 2022;10:771190.
6. Zafar A, Aslam N, Nasir N, Meraj R, Mehraj V. Knowledge, attitudes and practices of health care workers regarding needle stick injuries at a tertiary care hospital in Pakistan. JPMA. J Pakistan Med Assoc. 2008;58(2):57–60.
7. Alhoeibra H, Raza A, Siddiqui AA, Jameela F, Khan S, Dar SA, et al. Needlestick injuries among healthcare workers: a study from a tertiary care hospital, New Delhi. Adv Biores. 2019;10(2):129-37.
8. Makade KG, Bhawnani D, Verma N, Dengani M. Knowledge and response of health care workers after needle - stick injury in a tertiary care hospital setting in tribal Rajnandgaon, Chhattisgarh, India. Int J Res Med Sci. 2017;5(3):816–20.
9. Madhavan A, Asokan A, Vasudevan A, Maniyappan J, Veena K. Comparison of knowledge, attitude and practices regarding needle-stick injury among health care providers. J Family Med Prim Care. 2019;8(3):840-5.
10. 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. 2010;35(1):74-7.
11. Kanani K, Rajdev S, Mullan S. Assessment of knowledge, attitude and practices among healthcare workers in a tertiary care hospital on needle stick injury. Advan Infect Dis. 2024;14:487-95.
12. Bhat AA, Iram ST, Ahmad J. A study of the knowledge, attitudes and practices regarding needle stick injuries among health care workers in government health facilities of District Bandipora, J&K. Int J Con Med Res. 2020;7(6):9-13.

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