

ASSESSMENT OF THE RELATIONSHIP BETWEEN NURSES' KNOWLEDGE REGARDING NEEDLE STICK INJURY AND THEIR CLINICAL EXPERIENCE IN THE HOSPITALS OF KARACHI

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Abstract

Needle stick injuries (NSIs) are one of the major occupational hazards among nurses and health care personnel as they are exposed to serious blood borne infections like hepatitis B, hepatitis C and human immunodeficiency virus. It is essential to have adequate knowledge on the prevention and management of NSIs to maintain workplace safety and to reduce occupational exposure. Therefore, this study aimed to evaluate the relationship between nurses' knowledge about needle stick injury and their professional experience. The study adopted a quantitative cross-sectional descriptive correlational research design. Data were collected from 73 participants through non-probability convenience sampling technique. Research Instrument: A structured self-administered questionnaire was used as the research instrument. It included demographic information and Knowledge related questions on needle stick injury prevention, reporting, first aid and post-exposure management. In the study, ethical principles have been followed; permission from the concerned authority, informed consent of participants, confidentiality, anonymity, and voluntary participation have been maintained. Data were analyzed by descriptive statistics and Pearson correlation analysis using SPSS . The results showed that the majority of participants had good knowledge on immediate reporting of NSIs, transmission of blood-borne pathogens, first aid management and post-exposure testing . Some misconceptions were identified about needle recapping, sharps disposal and safety-engineered devices. Correlation analysis indicated a weak positive but statistically insignificant relationship between experience and knowledge ($r = .127, p = .284$) suggesting that more experience did not significantly increase knowledge levels. The study found that overall nurse's knowledge regarding NSIs was adequate but experience was not a major factor in influencing knowledge. Therefore, the study recommends regular

educational programs, strict enforcement of infection control policies, availability of safety equipment, strengthening of reporting mechanisms and conducting more research with larger sample sizes to enhance occupational safety and decrease needle stick injuries among healthcare personnel.

INTRODUCTION

Needle stick injury (NSI) is one of the major occupational hazards for nurses and other health care workers as it can lead to exposure to blood-borne infections like hepatitis B virus, hepatitis C virus and human immunodeficiency virus. Nurses are at high risk because they are involved directly in medication administration, injections, blood sampling, intravenous cannulation, wound care and disposal of sharps. Needle stick injuries may occur in clinical and research settings due to needle recapping, improper disposal of used needles, lack of sharps containers, workload pressure, inadequate training and failure to follow standard precautions. Recent studies have shown that NSIs continue to be a significant safety concern among nurses and nursing students despite the availability of infection-control guidelines and safety-engineered devices (Almutairi, 2025; Goyal et al., 2025; Mohd Fahami Nur Azlina et al., 2026). According to a 2025 study among nurses and nursing students, NSIs are a common occupational risk and the importance of having adequate knowledge, attitude and practice towards their prevention and management (Goyal et al., 2025). Similarly, a study conducted in Malaysia in 2026 reported that NSIs among nurses may result in serious consequences because of the possible transmission of HIV, hepatitis B, and hepatitis C (Mohd Fahami Nur Azlina et al., 2026).

Knowledge about needle stick injury is important for prevention and early management. Nurses should be aware that needle stick injuries should be reported immediately, the site of injury should be washed with soap and water, the source patient or material should be tested when possible and post-exposure prophylaxis should be initiated as per institutional protocols. However, recent studies indicate that knowledge gaps remain among nurses and nursing students. Kaur et al. (2025) reported that most of the respondents had average knowledge about needle

stick injury and only few had good knowledge among 100 nursing students. Pokkuluri et al. (2025) found that the knowledge, attitude and practice of nursing students regarding NSIs were variable and educational interventions were useful in improving their scores. These findings imply that formal education and regular training are required as clinical exposure alone may not be enough to ensure safe practice.

The burden of needle stick injuries is of particular concern in developing health care systems, where limited resources, high patient load, shortage of staff and weak reporting systems can increase the occupational exposure. A meta-analysis conducted in Pakistan in 2025 revealed that nurses and nursing students are particularly susceptible to NSIs and may be at risk of infections such as HIV and hepatitis B/C. The review pointed to NSIs as a significant occupational hazard and stressed the necessity of preventive measures in health care facilities (Ghanei Gheshlagh et al., 2025). Moreover, some recent studies among nursing students and health workers in low-resource settings showed that although most of the participants were aware of the hazards of NSIs, they may still practice unsafe behaviors such as needle recapping and underreporting (Ataelkarim et al., 2026; Pokkuluri et al., 2025). These findings suggest that the prevention of NSIs is not only dependent on knowledge but also on institutional support, availability of safety equipment and culture of immediate reporting.

While professional experience is thought to improve nurses' knowledge and safety practices, recent evidence suggests this relationship may not always be strong. Some experienced nurses may develop better confidence and practical skills over a period of time, but they may also continue unsafe habits if they have not received updated training. On the other hand, less experienced nurses may have recent theoretical knowledge but

lack confidence in clinical practice. A study done among nurses in Malaysia in 2026 found that knowledge, attitude and practice related to NSIs were important but not all the time strongly associated, implying that knowledge does not necessarily translate into safe behaviour (Mohd Fahami Nur Azlina et al., 2026). Likewise, Kiyak Yorulmaz and Kaya (2026) reported that nursing students might have knowledge about needlestick and sharps injuries but still remain at risk due to limited clinical experience and practice-related challenges. Thus, it is important to determine whether the number of years in practice for nurses is significantly associated with their knowledge of needle stick injury.

The present study was conducted to find out the relationship between the knowledge of nurses about needle stick injury and their experience. This topic is important as safe clinical practice and sufficient knowledge are needed to prevent NSIs. If significant relationship exists between the two, senior nurses can be used as mentors for junior staff. If no significant relationship exists then regular training should be provided to all nurses regardless of experience level. Recent studies have highlighted the importance of continuous education, transparent reporting systems, safety-engineered devices, and strict adherence to standard precautions to reduce the risk of NSIs among healthcare workers (Almutairi, 2025; Goyal et al., 2025; Ghanei Gheshlagh et al., 2025). This study therefore can help the administrators in the hospitals and nursing educators to identify the knowledge gaps and provide targeted education to improve the safety of nurses at work and minimize the occurrence of needle stick injuries.

Research Question

Is there a significant relationship between nurses' knowledge regarding needle stick injury and their years of clinical experience?

Null Hypothesis H0: There is no significant relationship between nurses' knowledge regarding needle stick injury and their clinical experience.

Alternative Hypothesis H1: There is a significant

relationship between nurses' knowledge regarding needle stick injury and their clinical experience.

Problem Statement:

Needle stick injuries (NSIs) remain a significant occupational hazard for nurses and other healthcare workers around the world because they put healthcare workers at risk for serious blood-borne infections such as hepatitis B, hepatitis C and HIV. Nurses are especially vulnerable because they are constantly involved in invasive procedures, administration of medicines and handling of sharp instruments. Even with the availability of standard safety precautions and infection control guidelines, many healthcare institutions report frequent NSIs among nursing staff. Recent studies show that nurses have moderate knowledge of NSI prevention and management; however, there are significant gaps in safe practices, reporting practices, and post-exposure management (Almutairi, 2025; Goyal et al., 2025). Moreover, these injuries also occur due to lack of training, heavy workload, lack of supervision and lack of clinical experience among nurses and nursing students (Kaur et al., 2025; Pokkuluri et al., 2025).

Clinical experience plays an important role in improving nurses' competency, confidence and adherence to safety measures regarding needle stick injury prevention. Previous studies, however, have shown mixed results on whether experienced nurses have better knowledge and safer practice than less experienced nurses. While some studies found a significant association between nurses' knowledge and management of NSIs, others found no statistically significant relationship between knowledge levels and experience (FMHR, 2025; Kaur et al., 2025). Therefore, further research is needed to examine the relationship between nurses' knowledge regarding needle stick injuries and their clinical experience. Understanding this relationship can help health care institutions design targeted educational programs and training strategies to reduce occupational exposure and improve patient and nurse safety.

Literature Review

Needle stick injuries (NSIs) are still considered as one of the most common occupational hazards among nurses, nursing students and other healthcare workers due to the fact that they can expose staff to blood-borne pathogens such as hepatitis B virus, hepatitis C virus and human immunodeficiency virus. Recent literature suggests nurses are especially vulnerable because they routinely administer injections, draw blood, assist with invasive procedures, and dispose of sharps while caring for patients. A cross-sectional study by Goyal et al. in 2025 stated that even though safety protocols are present, there are still gaps in knowledge and practice, which is why NSIs are still a major concern for nurses and nursing students. In this study, 207 respondents were involved. The results showed that most respondents had moderate to good knowledge. There was no statistically significant difference between nurses and nursing students in some aspects of attitude and practice, which means that clinical exposure may not guarantee safer behavior. This finding is applicable to the current study as it highlights the importance of assessing whether nurses' experience is associated with their knowledge of needle stick injury prevention and management (Goyal et al., 2025).

Recent evidence also suggests that the burden of NSIs is still high in South Asian healthcare settings. According to a meta-analysis by Ghanei Gheshlagh et al. (2025) on nurses and nursing students in Pakistan, NSIs are a serious occupational risk due to possible exposure to HIV and hepatitis B/C. The review included observational studies published until 2025 and highlighted the need for effective preventive measures among nurses and nursing students in Pakistan (Ghanei Gheshlagh et al., 2025). Similarly, a comparative study by Khan et al. (2026) in tertiary care hospitals of Peshawar found NSIs to be prevalent among healthcare workers with higher incidence reported among nurses than doctors. Their study also reported differences in knowledge, attitudes, practices and impact of NSIs between professional groups indicating that nurses need continuous training and strong institutional safety systems (Khan et

al., 2026). These studies suggest that needle stick injury is not only a question of individual knowledge but also a wider occupational health problem influenced by workload, professional role, safety culture and availability of protective resources.

Knowledge about NSIs is an important part of prevention as health care workers need to know the routes of infection, first aid measures, reporting procedures, post exposure prophylaxis and safe disposal of sharps. Sain et al (2025) assessed knowledge, attitude and practices of nurses towards NSIs, prevention of HIV and hepatitis B in a tertiary care center of Nagpur, India. They mentioned that nurses are exposed to high risk due to their frontline roles in patient care. The study highlighted that even with the availability of vaccination and post-exposure prophylaxis guidelines, awareness and compliance may still be poor in developing countries (Sain et al., 2025). Almutairi (2025) evaluated emergency nursing professionals in Saudi Arabia and found good knowledge and positive attitudes toward NSIs, but the study still found a need for continuing education and practical safety measures among emergency nurses. The findings are relevant to the current study as nurses may be aware of the theoretical risk of needle stick injuries but still need reinforcement in reporting, first aid and proper post exposure management.

Studies in nursing students also reveal that knowledge does not always translate to safe practice. Pokkuluri et al. (2025) performed an institutional based cross sectional study on 186 nursing students and reported that educational intervention increased the scores of knowledge, attitude and practice of needle stick injury. The findings indicate that structured teaching, demonstrations and refresher training may improve awareness and behaviour on safety. Ataelkarim et al. (2026) did a similar study on 300 nursing students in Omdurman Islamic University and stated that the majority of nursing students knew that NSIs can transmit blood-borne infections, but there were considerable gaps in reporting behavior, needle recapping, and practical response after injury. They found that

95.3% of students were aware of the fact that NSIs could transmit HIV, hepatitis B and hepatitis C, but many still reported unsafe practices such as recapping needles and failing to report minor injuries (Ataelkarim et al., 2026). The evidence suggests that knowledge needs to be supported by clinical supervision, access to sharps containers and a non-punitive reporting culture.

It is assumed that experience enhances knowledge and safety behavior, but recent studies have shown that the relationship is not always strong. Mohd Fahami Nur Azlina et al. (2026) assessed knowledge, attitude, and practice towards needlestick injury prevention among 352 nurses in a Malaysian public hospital. They found moderate knowledge and relatively high attitude and practice scores. Their study however reported no significant correlation between knowledge and attitude, knowledge and practice, and attitude and practice, suggesting that knowledge alone may not be able to predict safe behaviour (Mohd Fahami Nur Azlina et al., 2026). This result is very relevant to the present study where experience had only a weak positive and statistically non-significant association with knowledge. Similarly, high knowledge, attitude and behavior scores were reported by Kiyak Yorulmaz and Kaya (2026) in nursing students, but 29.5% had experienced at least one needlestick or sharps injury during their education. This once more indicates that awareness by itself is not enough to avoid injury unless supported by safe systems and repeated training (Kiyak Yorulmaz & Kaya, 2026).

In summary, the literature from 2025–2026 showed that needle stick injury remains a major occupational health problem among nurses and nursing students globally. Most of the studies showed that nurses and students have moderate to good knowledge about the transmission, reporting and prevention of the disease. However, there are gaps in practice especially in needle recapping, underreporting, post-exposure care and sharps disposal. The literature also indicates that experience itself does not necessarily improve knowledge or prevent unsafe practices. The importance of the present study is that it gives evidence about the relationship

between the experience and knowledge of nurses about needle stick injuries. The findings could guide the development of regular training programs, better reporting systems, the availability of sharps disposal containers, and the promotion of safety-engineered devices for all nurses irrespective of years of experience.

Research Methodology

Research Design

A quantitative cross-sectional descriptive correlational research design was employed to ascertain the relationship between nurses' knowledge on needle stick injury and their professional experience. This design was found appropriate because it allowed the researcher to collect data from participants at one point in time and study the association between the variables without manipulation of the study environment. The design also helped to describe the level of knowledge about needle stick injury prevention and management among participants

Sampling Technique

In this study, the non-probability convenience sampling technique was employed to select participants who were available and willing to participate during data collection period. The sample comprised 73 nurses/healthcare personnel in the selected healthcare setting. This sampling technique was chosen because it was cost effective, time saving and appropriate to collecting data from available respondents within the short period of the study.

Research Instrument

Data were collected using a structured self-administered questionnaire developed based on the objectives of the study and relevant literature on needle stick injuries. The questionnaire was divided into two parts i.e. demographic data (age, gender, profession and experience) and knowledge based questions on needle stick injury prevention, reporting, risk of transmission, first aid and post exposure management. The questionnaire was designed with close-ended questions with pre-determined options for ease of analysis and interpretation of data.

Ethical Consideration

Ethical principles were strictly adhered to during the study. Permission to carry out the research was obtained from the respective institutional authority before data collection. The purpose and objectives of the study were explained to the participants and informed consent was obtained from each before participation. Confidentiality and anonymity of participants were preserved as no personal identifiers were recorded on the questionnaire. The participants were also

informed that their participation was voluntary and they had the right to withdraw from the study at any time without any penalty or consequences.

Data Analysis

Data was analyzed using SPSS .First of all descriptives is run to see the status of the data after that inferential statistics was run to apply pearson coorelation and to test hypothesis.

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
Age	73	1	4	2.16	.107	.913	.452	.281	-.515	.555
Gender	73	1	2	1.66	.056	.478	-.678	.281	-1.585	.555
Profession	73	1	4	1.74	.139	1.191	1.235	.281	-.235	.555
Experience	73	1	3	1.95	.080	.685	.070	.281	-.816	.555
Should a needle stick injury be reported immediately to the supervisor/biosafety officer?	73	1	2	1.11	.037	.315	2.552	.281	4.641	.555
Is it acceptable to recap needles with two hands after use in a research lab?	73	0	2	1.53	.062	.529	-.429	.281	-1.199	.555
Can needle stick injuries transmit bloodborne pathogens like HBV, HCV, and HIV to research staff?	73	1	2	1.05	.027	.229	3.995	.281	14.353	.555
Is washing the site with soap and water the recommended first aid for a needle stick injury?	73	1	2	1.15	.042	.360	1.994	.281	2.031	.555

In research settings, is it okay to dispose of used needles in regular trash if no sharps container is nearby?	73	1	2	1.60	.058	.493	.429	.281	1.868	.555
Should the source material/patient/animal be tested after a research-related needle stick when possible?	73	1	2	1.14	.041	.346	2.156	.281	2.723	.555
Are research personnel exempt from baseline blood testing after a needle stick if they work with cell lines only?	73	1	2	1.30	.054	.462	.884	.281	1.254	.555
Does use of safety-engineered needles eliminate all risk of needle stick injuries in research?	73	1	2	1.22	.049	.417	1.386	.281	.081	.555
Valid N (listwise)	73									

Descriptive statistics show that data were obtained from 73 respondents. The average age score was 2.16 ± 0.913 which shows that most of the respondents fall in the lower to middle categories of age as per the coding used. Gender had a mean of 1.66 ± 0.478 revealing that one gender category was more represented than the other. The mean scores for profession and experience were 1.74 ± 1.191 and 1.95 ± 0.685 , respectively, which indicated that the majority of the respondents had low to moderate levels of professional experience. The skewness and kurtosis values for demographic variables were within acceptable ranges, with some variables showing a little asymmetry, which is normal for categorical data.

The results in terms of knowledge of needle stick injury show that respondents had good knowledge on important safety practices in

general. Most of the participants reported that needle sticks injuries should be reported immediately as shown by low mean score of 1.11 ± 0.315 . Also strong was the respondents' awareness that needle stick injuries can transmit bloodborne pathogens such as HBV, HCV, and HIV with a mean score of 1.05 ± 0.229 . Similarly, the participants had good knowledge of first aid measures, testing of source material and the need for baseline blood testing after exposure. However, some uncertainty was noted in the areas of recapping needles, disposal of used needles when sharps containers are not available, and the notion that safety-engineered needles remove all risk. Overall, the results suggest that although nurses/research personnel had good basic knowledge regarding the prevention and management of needle stick injury, there is a need for further training to address

misconceptions and improve compliance with safe practice.

Correlations

		Experience	Knowledge
Experience	Pearson Correlation	1	.127
	Sig. (2-tailed)		.284
	N	73	73
Knowledge	Pearson Correlation	.127	1
	Sig. (2-tailed)	.284	
	N	73	73

The correlation analysis was conducted to determine the relationship between participants' experience and their knowledge about needle stick injuries. The findings showed a weak positive correlation between experience and knowledge ($r = .127$). This means that as the level of experience increased the knowledge scores increased slightly too. However, the relationship was not statistically significant ($p = .284$) because the p-value was higher than the standard level of significance, 0.05. This result indicates that there is no significant association between professional experience and knowledge regarding needle stick injury prevention and management among the respondents included in this study. In other words, more experienced participants were not necessarily more knowledgeable than less experienced participants. The lack of a statistically significant association may suggest that knowledge about needle stick injuries is influenced more by factors such as educational training programs, institutional safety policies, continuing professional development, and awareness of infection control rather than years of experience alone. The findings emphasize the need for periodic educational interventions and refresher training for all health care personnel irrespective of their level of clinical experience to ensure adequate understanding and compliance with standard precautions and needle stick injury prevention protocols.

Discussion

The present study showed that the participants had good knowledge on the prevention and management of needle stick injury especially on immediate reporting, transmission of HBV, HCV and HIV, first aid with soap and water and the need for source testing following exposure. Similar to recent studies, nurses and nursing students generally have adequate knowledge of NSI hazards but have some shortcomings in practical aspects such as needle recapping, disposal of sharps, reporting behaviour and post-exposure management (Goyal et al., 2025; Kaur et al., 2025; Mythreyee & Eswarappa, 2025). Recent evidence also confirms that NSIs are still a major occupational risk among nurses due to their frequent contact with injections, blood collection and sharp instruments (Ghanei Gheshlagh et al., 2025; Mohd Fahami Nur Azlina et al., 2026). In Pakistan, a meta-analysis in 2025 revealed pooled prevalence of NSI to be 48% among nurses and 43% among nursing students, underscoring the gravity of this issue in clinical settings (Ghanei Gheshlagh et al., 2025). Similar concerns were reported from Peshawar where NSIs were more prevalent among nurses as compared to doctors and underreporting remained a major issue (Khan et al., 2026). The findings highlight the need for continuing education, rigorous reporting systems and easy access to sharps containers and post exposure services.

The correlation analysis of the present study revealed that the relationship between experience and knowledge about needle stick injury was weak positive but statistically non-significant ($r = .127$, $p = .284$). This indicates that higher experience was not strongly associated with better knowledge among respondents. This finding is in line with recent studies, which suggest that knowledge and safe practice are not only influenced by years of experience but also by formal training, institutional policies, supervision, safety culture, and availability of protective resources (Gomez, 2026; Mohd Fahami Nur Azlina et al., 2026; Pokkuluri et al., 2025). The knowledge, attitude and practice scores were not significantly correlated in a Malaysian study, indicating that knowledge does not necessarily translate into safe behavior (Mohd Fahami Nur Azlina et al., 2026). Furthermore, Goyal et al. (2025) reported no significant difference in knowledge and practice between nurses and nursing students, highlighting the importance of structured training for all and not only clinical exposure. Similarly, in the study by Pokkuluri et al. (2025), educational interventions resulted in significantly improved scores of knowledge and practice, highlighting the importance of repeated training sessions. Thus, the findings of this study indicate that hospitals and research facilities should have regular NSI prevention training, strict no-recap policies, improve reporting mechanisms and provide availability of safety-engineered devices to all healthcare workers regardless of seniority.

Conclusion

In conclusion, the study found that nurses/research personnel had good knowledge about needle stick injury prevention and management in general especially about immediate reporting, blood borne pathogen transmission, first aid measures and post exposure testing. However, there were some gaps and misconceptions regarding recapping of needles, disposal of sharps, baseline blood testing and the overall effectiveness of safety-engineered needles. The correlation analysis showed a weak positive non-significant correlation between

experience and knowledge, suggesting that higher levels of professional experience did not necessarily result in significantly better knowledge. Hence, it is concluded that knowledge about needle stick injury cannot be assumed from the experience. To improve safety practices and reduce the risk of needle stick injuries among healthcare and research personnel, regular training, continuous education, strict adherence to infection control protocols, proper reporting systems and availability of sharps disposal facilities are essential.

Recommendations

1. Healthcare institutions should conduct regular educational and training programs on needle stick injury prevention, reporting procedures, and post-exposure management for all nurses and healthcare personnel regardless of their experience level.
2. Hospitals and research laboratories should strictly enforce infection control guidelines, including safe handling of needles, avoidance of needle recapping, and proper disposal of sharps in designated containers.
3. Healthcare facilities should ensure the continuous availability of safety-engineered devices, personal protective equipment (PPE), and accessible sharps disposal containers in all working areas to minimize occupational exposure risks.
4. A clear and confidential reporting system for needle stick injuries should be established to encourage immediate reporting and timely medical evaluation, counseling, and post-exposure prophylaxis when necessary.

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