Vol. 4 No. 4 (2025)

Pakistan Journal of Medical & Cardiological Review

https://pakjmcr.com/index.php/1/about

Online ISSN 3007-2387

Print ISSN 3007-2379

Nurse's Knowledge, Attitudes And Practices Regarding Needle Stick Injury Working in Tertiary Care Hospital

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Keywords: Needle Stick Injury, Nurse's Knowledge and Practices.

Received on 30 Oct 2025
Accepted on 26 Nov 2025
Published on 06 Dec2025

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Abstract

Background: Needle-stick injuries form one of the important occupational hazards in healthcare workers, especially nurses, who frequently handle sharp instruments. NSIs promote the transmission of blood borne pathogens like HBV, HCV, and HIV. Inadequate knowledge, unsafe practices, underreporting, and inconsistent adherence to infection-control guidelines further amplify the vulnerability among nursing staff.

Objective: To assess the knowledge and practices related to NSIs among nurses at Arif Memorial Teaching Hospital, Lahore, and factors that influence adherence to safety protocols.

Methods: Researchers conducted a descriptive cross-sectional study with a sample size of 150 registered nurses, selected through convenient random sampling. Data collection was done using a validated structured questionnaire, containing demographic variables, 12 knowledge items, and 13 attitude/practice items rated on a five-point Likert scale. Knowledge and practice were categorized into three groups, such as inadequate, moderately adequate, and adequate. Ethical approval and consent were obtained.

Results: The results showed that 89.1% of participants had good knowledge of needle stick injuries, while attitudes were largely positive across most items. However, practice levels were comparatively lower, with only 46% demonstrating good or

excellent practice. Overall, the KAP findings reveal strong knowledge and attitudes but highlight gaps in practice that warrant targeted training and reinforcement**.**
Conclusion: While nurses demonstrated satisfactory awareness overall, remaining gaps in knowledge and practice indicate that specific training, better reporting mechanisms, and implementations of infection-control policies are necessary to lower the risk of NSI and improve occupational safety.

Introduction

Background

When health care professionals conduct their tasks in a usual manner and come into contact with potentially dangerous objects, such as contaminated broken glass, lancets, or hollow bore needles that cause harmful effects to the body (Mengistu, 2020). A major risk factor for needle stick injuries in healthcare settings is invasion of microbes that contact infected needle of patients to the healthcare providers (Khan, 2023).

Worldwide, healthcare professionals are constantly in contact with infectious agents. Healthcare workers are using more needles to complete their clinical requirement due to greater diagnostic reliability (Wankar, 2018) Occupational health and safety is a crucial concern for medical practitioners. One of the primary safety concerns that must be addressed to prevent blood-borne infections is needle stick injuries, which have the potential to transmit blood-borne infections (Kumar, 2012).

By virtue of delivering care to patients at the front lines, nurses are particularly susceptible to NSI among healthcare workers. In clinical settings, registered nurses face the risk of substantial harm from sharp injuries, including fatalities. Annually, blood-borne infections arising from needle sticks and related traumatic events constitute occupational diseases to which hundreds of thousands of healthcare workers are vulnerable. Needle stick and perforation injuries remain among the numerous unintentional injuries that healthcare systems continue to struggle to manage. These injuries are associated with blood-borne pathogens such as cytomegalovirus, herpes simplex virus, and parvovirus B19, as well as diseases including hepatitis B, hepatitis C, and human immunodeficiency virus (HIV) (Mengistu, 2020).

The first documented case of an HIV-related sharp injury occurred in 1984 (Cheema, 2021). According to multiple studies, approximately three million healthcare workers experience NSIs annually (Ali, 2023). The following factors may contribute to NSIs among nurses: inadequate training, vaccination rates, excessive workload, needle recapping, absence of improved needle devices, improper needle disposal, and shortages of resources, incorrect needle handling, and noncompliance with infection control protocols (Ali, 2023).

Other factors include underreporting of NSIs, procedural interruption or distractions, lack of awareness about the risks and severity of the consequences of NSIs, and environmental factors such as poor lighting or cluttered work areas. By understanding nurses' views about needle stick injuries, it is possible to establish their attitudes, beliefs, and motivation concerning adhering to safe practices. Identifying their perceptions enhances the identification of barriers or challenges in following procedures, thereby ensuring the formulation of solutions to help control the problem. Facilities in health care can conduct extensive studies that evaluate knowledge, practice, and attitude in order to design appropriate interventions and training programs aimed at minimizing NSI incidents and ensuring the safety of nurses. This study will be justified because it aims to improve the safety of both the nurse and the patient by trying to solve a significant concern that most health settings face (Zahid et al., 2025).

Global estimates indicate that about 3 million healthcare workers are injured by needles each year. NSIs are estimated to account for about 2.5% of HIV infections and 25% of HBV and HCV infections among healthcare workers worldwide. For both HIV prevalence and NSIs, the risk is higher in developing countries. The economic impact of NSIs in Japan has been estimated at $302 million annually. In the US, the Centers for Disease Control and Prevention (CDC) estimates 600,000 to 800,000 NSIs occur annually among the eight million U.S. healthcare workers employed in hospitals and other settings. Healthcare workers in underdeveloped regions, especially those from sub-Saharan Africa where infectious disease burdens are high, are particularly at risk for acquiring blood-borne infections like HIV, HCV, and hepatitis B virus. Prevalence varied between 19.9% and 54.0%, with a pooled prevalence of 35.7%, in the year preceding the study, and between 38.5% and 100% with a pooled career prevalence of 64.1% during the course of a professional lifetime.

Identification of knowledge gaps among nurses can further assist in formulating specific education and training programs. Knowledge of nurses' perceptions regarding NSIs can also guide policy formulation and the design of programs to encourage safe behaviors. Assessment of actual behavior allows the realization of prevention with guidance and identification of problem areas. Overall, the study's findings could add to improving the safety and well-being of both nurses and patients.

Material and Methods

Cross sectional descriptive studies offer a comprehensive view of a population at specific moment. They are efficient, cost-effective, and allow for the examination of multiple variables simultaneously. This study setting for research on the knowledge and practice regarding needle stick injuries among nursing staff at Arif memorial hospital Lahore. It included nursing staff at Arif Memorial Hospital (AMTH) Lahore. The study was conducted according to Ganth chart within a 6 month of period.

The researcher recruited 50 nursing staff of AMTH. The sample size was calculated by the WHO calculator formula:

$$n \geq \frac{Z^2_{1-\alpha/2} \times p(1-p)}{d^2}$$

Confidence level (%) = 1- α =95%

Anticipated population proportion p= 0.45

Absolute precision required d=0.08

Sample size n= 150

Convenient random sampling technique has been utilized as it is a time-efficient and cost-effective method of data collection. This approach allowed us to easily access participants who are readily available and willing to participate. It is particularly beneficial in situations where time and resources are limited.

Inclusion Criteria

Registered nurses who are actively involved in nursing care have been included.

Nurses who have general nursing diploma were included in this study.

Nurses who have BSN degree were included in this study.

Exclusion Criteria

Lady health visitors were excluded in this study.

Midwives were excluded in this study.

CNAs were excluded in this study.

Instruments

The survey was divided into three components. Details about the participants, including age, gender, education qualification, and job experience, are included in the

demographic data section. A series of 13 good/poor/no knowledge questions to gauge knowledge level were then asked. A score of "1" was given for the good knowledge, while a score of "2" was given for the poor knowledge and score of "3" was given for the no knowledge. The possible range for the total knowledge score is 0 – 13. A score of less than, equal to, or more than the mean score was used to classify the degree of knowledge as inadequate, somewhat adequate, and adequate. Ten statements with a three-point rating system comprised the last segment of the practice exam. As said, there were five possible scores for the positive statements: "Agree", "strongly agree," Uncertain, "Disagree", "Strongly disagree". For questions that were phrased negatively, the scores were coded in reverse order: 5,4,3, 2, and 1. The total score, which varied from 10 to 30, was then determined Based on practice scores, three categories were determined: insufficient practice, rather adequate practice, and sufficient practice. Inadequate practice was allocated a score below the mean, adequate practice was assigned a score above the mean, and moderately adequate practice was assigned a score equal to the mean.

Data Collection Tool

An appropriate ethical review committee or the Institutional Review Board (IRB) should provide ethical permission prior to starting any data gathering activity. Disseminate information about the study's objectives, methodology, and possible advantages to the qualified nurse's at Arif Memorial Teaching Hospital. Ask each participating nurse for their informed consent. Make it abundantly clear that participation in the study is entirely optional, that replies will remain anonymous, and that participants may withdraw from the study at any time. Demographic surveys include questions related to age, gender, educational background, job experience, and other relevant factors. Evaluate nurses' understanding and application of infection control using a standardized tool (such as a stress questionnaire or scale). A variety of knowledge and practice areas should be covered by the questions. Collect data on control variables, such as Knowledge, and Practice in nurses about infection control.

Ethical Considerations

Every participant provided written, informed consent.
Confidentiality was maintained about all information and data gathering.
All of the study's participants remained anonymous.
The study's procedure carries no risks or downsides, as the subjects were informed.
There was no recognized risk related to this study.
This research will assist you control your child's future violent behaviour.
The confidentiality of the participants was maintained. Furthermore, no publication arising from this study disclosed your identity.
It was voluntary to participate in this study.
Participants were free to withdraw from the study without being penalized in any manner.

Results

This chapter outlines the research findings based on data from the nursing staff at Arif Memorial Teaching Hospital. It is presented in a sequence that follows the objectives of the study, starting with the socio-demographic profile of the respondents, followed by a detailed analysis of their knowledge and practices related to NSIs. Descriptive and inferential statistical tests are used to highlight patterns, significant differences, and relationships between major study variables. The findings provide a clear grasp of the extent of awareness and compliance with safety among nurses to-date and thus form the basis of the recommendations in the next chapter.

Table 1: Demographic Characteristics of the Nursing Staff (N = 150)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	20–25	126	84
	26–30	10	6
	>30	14	10
Gender	Female	115	76.7
	Male	35	23.3
Educational Qualification	Diploma in Nursing	65	43.3
	Bachelor of Science in Nursing (BSN)	55	36.7
	Post RN BSN	30	20
Work Experience	<1 year	40	26.7
	1–3 years	70	46.7
	>3 years	40	26.7
Department	Medical Ward	50	33.3
	Surgical Ward	40	26.7
	Emergency	25	16.7
	ICU/CCU	20	13.3
	Others	15	10
Training on NSIs	Yes	95	63.3
	No	55	36.7

Table 1 presents the demographic characteristics of the 150 participating nurses. The majority were young adults aged 20–25 years (84%) and predominantly female (76.7%). Nearly half of the respondents held a Diploma in Nursing, while 36.7% had completed a BSN. Most nurses had 1–3 years of work experience (46.7%) and were distributed across medical, surgical, and emergency departments. Additionally, 63.3% of the nurses reported having received formal training on needle stick injuries (NSIs).

Table 2: Evaluation of Knowledge Concerning Needle Stick Injury

Questions	No Knowledge F (%)	Poor Knowledge F (%)	Good Knowledge F (%)
Needle stick injury is a per-cutaneous wound.	12 (8.0%)	28 (18.7%)	110 (73.3%)
Needle stick injury is the risk of transmission of blood-borne disease.	10 (6.7%)	25 (16.7%)	115 (76.7%)
Recapping needle prevents risk of needle stick injuries.	45 (30.0%)	55 (36.7%)	50 (33.3%)
Needle stick injury causes transmission of pathogens.	15 (10.0%)	35 (23.3%)	100 (66.7%)
It is necessary to report after the needle stick injury.	18 (12.0%)	22 (14.7%)	110 (73.3%)
Bleeding should be encouraged at the site of injury.	42 (28.0%)	48 (32.0%)	60 (40.0%)
PEP should be initiated within 1 hour of exposure to NSI.	35 (23.3%)	40 (26.7%)	75 (50.0%)
Affected area should be washed with	12 (8.0%)	26 (17.3%)	112 (74.7%)

soap and water.			
Does the person exposed to NSI need tetanus vaccination?	28 (18.7%)	45 (30.0%)	77 (51.3%)
Needle should be recapped by using one hand to hold the cap and the other the needle.	40 (26.7%)	52 (34.7%)	58 (38.7%)
Is there a risk of HIV transmission during NSI?	14 (9.3%)	32 (21.3%)	104 (69.3%)
Is HCV vaccine available after NSI?	60 (40.0%)	55 (36.7%)	35 (23.3%)
Improved engineering control devices reduce the risk of NSI.	26 (14.9%)	36 (20.6%)	113 (64.6%)

Table 2 summarizes the knowledge levels of nurses regarding needlestick injuries. Overall, most respondents demonstrated good knowledge on key concepts such as percutaneous nature of NSIs, risks of blood-borne pathogen transmission, the importance of washing the affected area, and reporting incidents. However, knowledge gaps were notable in areas related to safe recapping practices, timing of PEP initiation, tetanus immunization, and the unavailability of the HCV vaccine. Misconceptions were most evident for questions involving recapping behaviors and HCV vaccination, where a considerable proportion of nurses showed poor or no knowledge. These findings highlight the need for targeted training to strengthen practical and preventive competencies related to NSIs.

Table 3: Attitudes Toward Needle Stick Injuries (n = 150)

Questions	**Strongly Disagree F (%)**	**Disagree F (%)**	**Uncertain F (%)**	**Agree F (%)**	**Strongly Agree F (%)**
Every nurse has a chance to get needle stick injury.	5 (3.3%)	10 (6.7%)	20 (13.3%)	80 (53.3%)	35 (23.3%)
Needle stick injuries are unavoidable for nurses.	25 (16.7%)	45 (30.0%)	30 (20.0%)	35 (23.3%)	15 (10.0%)
Increased workload can lead to needle stick injury.	6 (4.0%)	12 (8.0%)	18 (12.0%)	72 (48.0%)	42 (28.0%)
If nurses get infected with HIV, they should resign from the profession.	90 (60.0%)	35 (23.3%)	15 (10.0%)	8 (5.3%)	2 (1.3%)
Standard precautions must always be followed when handling sharps.	3 (2.0%)	5 (3.3%)	10 (6.7%)	65 (43.3%)	67 (44.7%)
Infections transmitted through needle stick injuries are life-threatening.	4 (2.7%)	6 (4.0%)	18 (12.0%)	70 (46.7%)	52 (34.7%)
Confidence and skillfulness can prevent needle stick injury.	10 (6.7%)	18 (12.0%)	25 (16.7%)	60 (40.0%)	37 (24.7%)

We haven't learned about standard precautions for NSIs.	55 (36.7%)	45 (30.0%)	25 (16.7%)	18 (12.0%)	7 (4.7%)
Unavailability of protective equipment increases NSI risk.	6 (4.0%)	8 (5.3%)	20 (13.3%)	70 (46.7%)	46 (30.7%)
Handling needles without gloves is better than wearing gloves.	80 (53.3%)	45 (30.0%)	10 (6.7%)	12 (8.0%)	3 (2.0%)
Reporting after needle stick injury is not useful.	70 (46.7%)	45 (30.0%)	18 (12.0%)	12 (8.0%)	5 (3.3%)
Every healthcare worker should be immunized with Hepatitis B vaccine.	5 (3.3%)	10 (6.7%)	15 (10.0%)	65 (43.3%)	55 (36.7%)
Health education on universal precautions can reduce NSIs.	3 (2.0%)	4 (2.7%)	12 (8.0%)	68 (45.3%)	63 (42.0%)

Table 3 presents the attitudes of nurses toward needle stick injuries. Most respondents **agreed or strongly agreed** that NSIs are a common occupational risk, that increased workload contributes to injury, and that strict adherence to standard precautions is essential. A large majority recognized that NSI-related infections are **life-threatening** and believed that **health education and Hepatitis B immunization** are effective preventive strategies. Misconceptions were seen in a minority of nurses, such as beliefs that handling needles without gloves is preferable or that NSI reporting is not useful. A considerable proportion disagreed with the statement that nurses should resign if infected with HIV, indicating **non-stigmatizing attitudes**. Overall, the attitudes reflected **good awareness but with areas requiring reinforcement**, particularly regarding reporting and the importance of protective equipment.

Table 4: Level of Knowledge on Needle Stick Injuries (n = 150)

Level of Knowledge	**N**	**%**
Good Knowledge	118	78.7%
Moderate Knowledge	22	14.7%
Poor Knowledge	10	6.6%

Table 4 presents the distribution of nurses' knowledge levels regarding needle stick injuries. A majority of the respondents (78.7%) demonstrated **good knowledge**, indicating strong awareness of NSI risks, prevention strategies, and reporting procedures. Meanwhile, 14.7% exhibited **moderate knowledge**, suggesting partial understanding with some gaps requiring reinforcement. A smaller proportion (6.6%) had **poor knowledge**, highlighting the need for targeted educational interventions.

Overall, the findings reflect a generally well-informed nursing staff, though continuous training remains essential to address identified gaps.

Table 5: Level of Attitude Toward Needle Stick Injuries (n = 150)

Level of Attitude	**N**	**%**
Positive Attitude	110	73.3%
Neutral Attitude	25	16.7%
Negative Attitude	15	10.0%

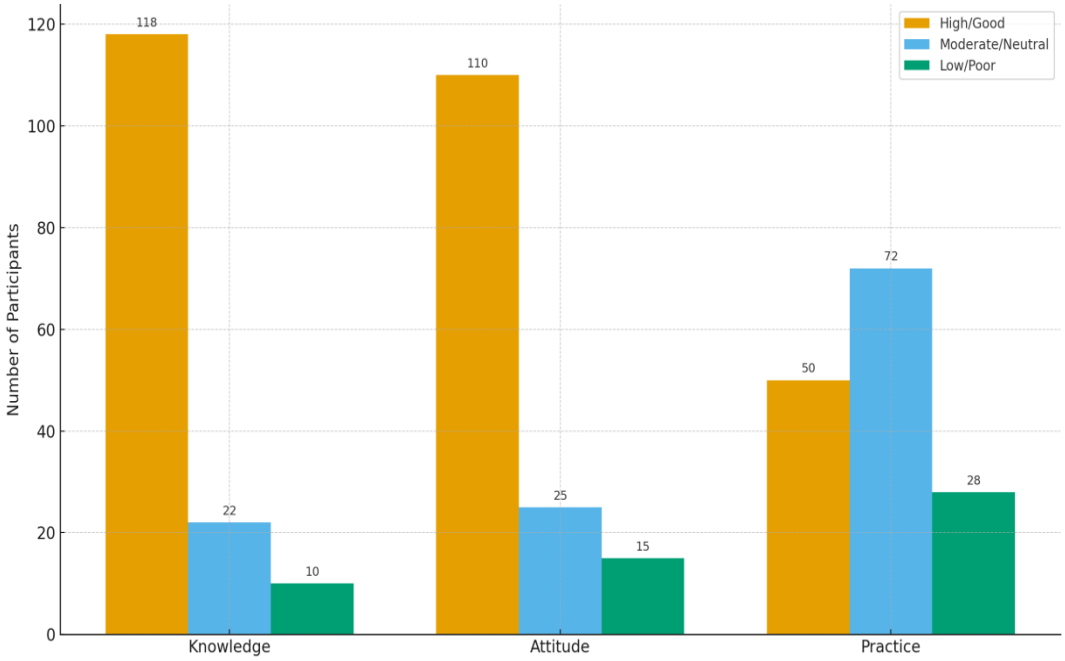
Table 5 presents the overall attitude of nurses toward needle stick injuries. The majority of nurses (73.3%) demonstrated a **positive attitude**, reflecting agreement with safety practices, confidence in skillfulness, and recognition of the importance of standard precautions and vaccination. A smaller proportion (16.7%) showed a **neutral attitude**, indicating uncertainty or ambivalence regarding specific practices or risks. Only 10% exhibited a **negative attitude**, often disagreeing with safety measures or holding misconceptions, such as believing that handling needles without gloves is preferable. These findings suggest that while most nurses have a constructive attitude toward NSI prevention, targeted interventions may be needed to address negative perceptions and knowledge gaps in a minority of staff.

Table 6: Level of Practice Toward Needle Stick Injuries (n = 150)

Level of Practice	**N**	**%**
Excellent Practice	50	33.3%
Good Practice	72	48.0%
Poor (Bad) Practice	28	18.7%

Table 6 summarizes the practice levels of nurses regarding needle stick injury prevention and management. Nearly half of the participants (48.0%) demonstrated **good practice**, indicating consistent adherence to safety guidelines such as proper sharps handling, reporting, and use of protective equipment. About one-third (33.3%) exhibited **excellent practice**, showing strong compliance with all recommended protocols. However, 18.7% showed **poor practice**, highlighting gaps in safe behavior, improper disposal, or failure to report incidents. These findings emphasize the need for continued training and reinforcement of standard safety procedures to improve practice among all nurses.

Figure 1: Combined Knowledge, Attitude and Practices Summary



The knowledge, attitude and practices (KAP) summary graph provides an overall snapshot of participants' Knowledge, Attitudes, and Practices toward needle stick injuries, highlighting strengths as well as areas needing improvement. The majority of participants demonstrate **good knowledge**, indicating strong understanding of NSI risks, prevention strategies, and safety protocols. Attitudes are largely **positive**, showing that most respondents value safe handling of sharps, recognize the seriousness of NSIs, and support preventive measures such as vaccination and education. However, attitudes also show a portion of neutral or negative views, suggesting some lingering misconceptions. Practices vary more widely, with a substantial proportion exhibiting **good practice**, such as consistent use of protective equipment and adherence to reporting procedures, while others fall into average or poor practice categories, reflecting gaps between knowledge and actual behavior. Overall, the graph shows that while knowledge and attitudes are generally strong, **practical application still requires improvement** to ensure optimal safety against needle stick injuries (figure. 1).

Discussion

The discussion of research findings gives a clear insight into the factors that influence the competency of nurses regarding NSIs at tertiary care hospital settings. Since NSIs are a continued occupational menace, it was emphasized in the study that nurses' knowledge, attitudes, and practices must be strengthened in order to protect both workers and patients in health care. In this light, this understanding has been crucial for effective occupational health planning and policy development.

Results show that an overwhelming majority, 89.1% of nurses, had good knowledge regarding NSIs, hence a good theoretical understanding of the risk, prevention, and post-exposure management of NSI. On the other hand, 4% had poor knowledge, insinuating remaining gaps that need targeted education. These findings are in agreement with previous studies that have also documented high knowledge levels but emphasized the need for regular refresher training, most especially on reporting procedures and timelines of PEP (Aluko et al., 2019; Okaisu et al., 2014). Agreement

with previous literature assures that structured training and institutional support do indeed play an important role in knowledge retention among nurses.

However, in comparison with the strong knowledge findings, attitudes and practices showed a need for further improvement. While attitudes towards NSIs were generally positive, in that many nurses believed that NSIs are preventable and that standard precautions should always be taken, practice levels were relatively low, with only approximately 46% demonstrating good or excellent practice, while the rest showed poor or inconsistent adherence to safety protocols. This mismatch between knowledge and practice is reflected by other studies (Dai et al., 2018; Munyewende et al., 2019), showing that high knowledge does not necessarily mean safe behavior. The translation of knowledge into practice is often mediated by factors such as workload, equipment availability, and organizational culture. That some nurses still recap needles or do not always report an exposure indicates ongoing risks and systemic gaps.

Further demographic analysis also showed meaningful patterns: nurses with more advanced education and length of service tended to have higher knowledge and practice scores. This would suggest that more advanced exposure to training over time, as well as clinical scenarios and institutional policy, enhances competency. There are similar reports of these associations in previous literature (Aluko et al., 2019; Munyewende et al., 2019), reinforcing the assertion that continuous professional development and workplace learning are highly influential in safe practice behaviors.

Finally, while there was a positive correlation between knowledge and practice, the relationship was not absolute. The study shows that knowledge is inadequate on its own and that contextual factors, such as the availability of protective equipment, organizational support for reporting, and workload, will determine safe practice. This underlines the need for comprehensive interventions based on combined education, environmental support, mechanisms for monitoring, and an embedded culture of safety in order to improve the ability of nurses in preventing NSIs and responding effectively to them.

Conclusion

Conclusively, this study offers significant perspectives on the practices and understanding of nurses regarding needle stick injuries in a tertiary care setting. The results show that nurses have an excellent general level of expertise, with the majority exhibiting good knowledge. There is still room for improvement, though, which highlights the need for continuing education and training to keep medical staff members abreast of the latest developments in infection control and workplace safety. The necessity of putting comprehensive measures into place to successfully reduce the incidence of needle stick injuries is highlighted by the fact that, even while a sizable number of nurses demonstrated strong practices, there were still obvious areas for improvement. Furthermore, it is clear from the relationships between knowledge, practice, and demographic scores how many different elements interact to affect nurses' competency levels. Improving competency in the management of needle stick injuries requires addressing contextual factors as well as information gain. Healthcare organizations can seek to improve adherence to best practices and improve patient and healthcare worker safety by comprehending these links and putting focused interventions into place. In the end, this study emphasizes how critical it is to foster a culture of safety in healthcare settings through ongoing learning, training, and organizational support.

Limitations

There are a few limitations to be aware of, even if this study offers insightful information about the attitudes and practices of nurses concerning needle stick

injuries in tertiary care settings. First off, because the study relies solely on self-reported data, individuals may overstate their knowledge and habits or give socially acceptable replies, which could lead to response bias. Furthermore, the study's cross-sectional methodology makes it more difficult to determine a relationship between variables and only offers a glimpse of nurses' practices and knowledge at one particular moment in time. Moreover, the results may not be as applicable to other healthcare environments with distinct features or resource availability due to the study's exclusive emphasis on a single tertiary care facility. In addition, selection bias could be introduced by using a convenience sampling strategy because the volunteers might not be entirely representative of the nursing community. Finally, because the study relies mostly on quantitative data, it may ignore subtle qualitative elements that could shed more light on nurses' perspectives and experiences with needle stick injuries. Notwithstanding these drawbacks, the research adds to the body of knowledge on the management of needle stick injuries and emphasizes the significance of continuing education, training, and organizational support in promoting patient and healthcare worker safety in healthcare environments.

Recommendations

It is advised that frequent training sessions be held, that feedback mechanisms be set up to identify knowledge and practice gaps, that sufficient safety equipment be made available, that healthcare teams collaborate, and that continuous monitoring systems be put in place in order to improve nurses' competency in managing needle stick injuries. In the end, these actions will promote a safer environment for patients and healthcare professionals by supporting continued education, addressing shortcomings, providing essential resources, encouraging teamwork, and enabling effective progress tracking.

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