

A DESCRIPTIVE CROSS-SECTIONAL STUDY ON NURSES' KNOWLEDGE, ATTITUDES, PRACTICES, AND REPORTING BEHAVIOR RELATED TO NEEDLE STICK INJURIES

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Abstract

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Background: Needle stick injury is a major occupational hazard among nurses, exposing them to blood-borne infections such as hepatitis B, hepatitis C, and HIV. It remains a significant public health concern due to inadequate knowledge, unsafe practices, and underreporting in healthcare settings. **Aim:** To assess the knowledge, attitude, and practices regarding needle stick injury among nurses working in a tertiary care hospital.

Methods: A descriptive cross-sectional study was conducted among 130 staff nurses using a convenient sampling technique. Data were collected through an adopted structured questionnaire. Statistical analysis was performed using SPSS version 21, including descriptive statistics, frequency distribution, and reliability testing. **Results:** The findings showed that nurses had moderate knowledge, with most participants correctly identifying needle stick injury risks and transmission routes. Attitude was generally positive, with over half of participants acknowledging the importance of reporting injuries and preventive measures. Practices were mixed, with good adherence to training but poor compliance in safe disposal and availability of safety equipment. **Conclusion:** Nurses demonstrated adequate knowledge and positive attitudes, but gaps in safe practices remain. Strengthening training

programs, ensuring availability of protective equipment, and enforcing safety protocols are essential to reduce needle stick injuries.

Keywords: Needle stick injury, nurses, knowledge, attitude, practice, occupational hazard, infection prevention

Introduction

Nurses are healthcare professionals responsible for direct patient care, placing them at high risk of occupational hazards such as needle stick injury (NSI). Needle stick injury refers to a cut or puncture wound caused by contaminated needles that may expose healthcare workers to blood and body fluids, increasing the risk of infection transmission (Liyew et al., 2020). Blood-borne infections include Hepatitis B virus (HBV), Hepatitis C virus (HCV), and Human Immunodeficiency Virus (HIV), which are transmitted through contaminated sharp instruments (Hassan et al., 2016). Blood-borne infections are diseases transmitted through infected blood and body fluids, while occupational exposure refers to accidental contact with infectious materials during clinical practice.

The global burden of needle stick injuries among nurses is significant. The worldwide prevalence is reported at 40.97%, with Southeast Asia showing the highest rate of 49.9% and the United States the lowest at 25.1% (Abdelmalik et al., 2023). WHO reports approximately four injuries per healthcare worker annually in Asia, Africa, and other regions (Bouya et al., 2020). Exposure risk remains high in clinical settings due to frequent handling of needles and sharps (Ji et al., 2022).

The national burden in Pakistan shows a reported needle stick injury incidence of 16.3% among nurses, although underreporting is common (Pervaiz et al., 2018). A significant proportion of healthcare workers remain unaware or do not report exposure, increasing the risk of untreated infections. Hepatitis B and C remain highly prevalent in Pakistan, further increasing occupational risk (Zafar et al., 2013). Lack of protective equipment, inadequate training, and unsafe practices contribute to the national burden (Moyo et al., 2021). Locally, healthcare facilities face challenges such as improper waste disposal systems, limited availability of safety devices, and inadequate infection prevention training. Nurses working in high-risk units such as emergency and operation theatres experience greater exposure. Recapping needles, improper disposal, and lack of protective equipment increase injury risk (Elagib et al., 2022). These conditions reflect weak occupational safety systems at the local level.

Needle stick injuries are major sources of occupational transmission of infectious diseases. More than 20 pathogens can be transmitted through contaminated needles, including HBV, HCV, and HIV (Henderson et al., 2022). The risk of transmission after

exposure is estimated at 30% for HBV, 3–4% for HCV, and 0.3% for HIV (Horak et al., 2023). Blood sampling, medication administration, and improper disposal are the most common procedures associated with injury (Zhang et al., 2022).

Nurses' attitudes toward needle stick injuries are affected by fear, anxiety, and emotional distress. High exposure risk in emergency and surgical settings influences behavioral changes and may reduce quality of care (Galehdar et al., 2020). Psychological stress following exposure also affects job performance and reporting behavior. Underreporting remains a major issue, leading to missed post-exposure prophylaxis and increased infection risk (Ebrahimi & Khosravi, 2017).

Nursing practices contribute significantly to the occurrence of needle stick injuries. Unsafe practices include recapping needles, improper disposal, lack of personal protective equipment, and inadequate training (Elagib et al., 2022). Injection overuse and shortage of safety devices further increase risk (Moyo et al., 2021). Improving knowledge and practice among nurses is essential to reduce occupational exposure and improve patient safety. This study focuses on assessing knowledge, attitude, and practice regarding needle stick injury among nurses to enhance prevention strategies and improve healthcare safety outcomes.

Methodology

Method

A descriptive cross-sectional study design was employed to assess the knowledge, attitude, and practices regarding needle stick injury among staff nurses. The study was conducted in Services Hospital Lahore, a tertiary care hospital. The study population consisted of registered staff nurses directly involved in patient care with at least six months of clinical experience. A convenient sampling technique was used to select participants. The total sample size was 130 nurses, calculated using Slovin's formula based on a population of 195 with a 5% margin of error. Inclusion criteria included registered nurses actively engaged in clinical duties and willing to participate with informed consent. Exclusion criteria comprised student nurses, administrative nurses, those with less than six months of experience, those absent during data collection, and those who declined participation or submitted incomplete responses. An adopted structured questionnaire was used to assess knowledge, attitude, and practices related to needle stick injury.

Data Collection Procedure

Permission was obtained from the relevant hospital authorities before initiating data collection. After approval, participants were approached within their clinical departments. The purpose of the study was explained clearly, and informed consent was obtained

from all participants prior to data collection. Confidentiality and anonymity of responses were ensured. The questionnaire was distributed among the selected nurses using a convenient approach. Participants were given adequate time to complete the questionnaire, and responses were collected on the same day to minimize data loss. The questionnaire included sections assessing demographic characteristics, knowledge, attitude, and practices regarding needle stick injuries.

Data Analysis Procedure

The collected data were entered and analyzed using SPSS version 21. Descriptive statistics, including frequencies and percentages, were applied to summarize the data. Data normality was assessed prior to analysis to ensure appropriate statistical methods. Reliability and validity of the study tool were evaluated to maintain accuracy and consistency of the findings. The results were presented using tables and bar charts to facilitate clear interpretation of the data.

Results

The majority of participants were aged 26–30 years (35.4%), indicating a relatively young workforce. Females constituted the dominant group (91.5%), reflecting the gender distribution in nursing. Slightly more than half of the participants were single (53.1%). Most held a diploma qualification (56.9%), while a considerable proportion had post-RN education (43.1%). Experience levels were fairly distributed, with the largest group having 6–10 years of experience (39.2%). Participants were almost equally distributed between medical and surgical wards, showing balanced representation across departments.

Table 1: *Socio-Demographic Characteristics of Participants (n = 130)*

| Variable | Category | Frequency | Percentage (%) |
|----------------|-------------|-----------|----------------|
| Age | 21–25 years | 28 | 21.5 |
| | 26–30 years | 46 | 35.4 |
| | 31–35 years | 38 | 29.2 |
| | 40–45 years | 18 | 13.8 |
| Gender | Male | 11 | 8.5 |
| | Female | 119 | 91.5 |
| Marital Status | Single | 69 | 53.1 |
| | Married | 61 | 46.9 |
| Qualification | Diploma | 74 | 56.9 |
| | Post RN | 56 | 43.1 |
| Experience | 1–5 years | 40 | 30.8 |
| | 6–10 years | 51 | 39.2 |

| | | | |
|------------|---------------|----|------|
| | 11–15 years | 39 | 30.0 |
| Department | Medical ward | 62 | 47.7 |
| | Surgical ward | 68 | 52.3 |

Most participants demonstrated strong basic knowledge regarding needle stick injury, particularly in defining the injury (96.2%) and identifying blood-borne pathogens (93.8%). Knowledge about Hepatitis B vaccination and transmission risk was also high. Gaps were observed in understanding Hepatitis C prevention and post-exposure prophylaxis. Overall knowledge levels showed that a large proportion fell into low (42.3%) and moderate (41.5%) categories, with only a small group having high knowledge (16.2%), indicating the need for improved educational interventions.

Table 2: Knowledge Regarding Needle Stick Injury (n = 130)

| Knowledge Indicator | Yes (%) | No (%) |
|---|---------|--------|
| Correct definition of needle stick injury | 96.2 | 3.1 |
| Hepatitis B requires three doses | 87.7 | 12.3 |
| HCV prevented by vaccine (incorrect belief) | 92.3 | 7.7 |
| Blood-borne pathogens awareness | 93.8 | 6.2 |
| HBV highest transmission risk | 83.1 | 16.9 |
| Awareness of post-exposure guidelines | 79.2 | 20.8 |
| No prophylaxis for HCV | 59.2 | 40.8 |
| Proper antiseptic washing after injury | 93.1 | 6.9 |
| Safe disposal in sharps container | 86.2 | 13.8 |

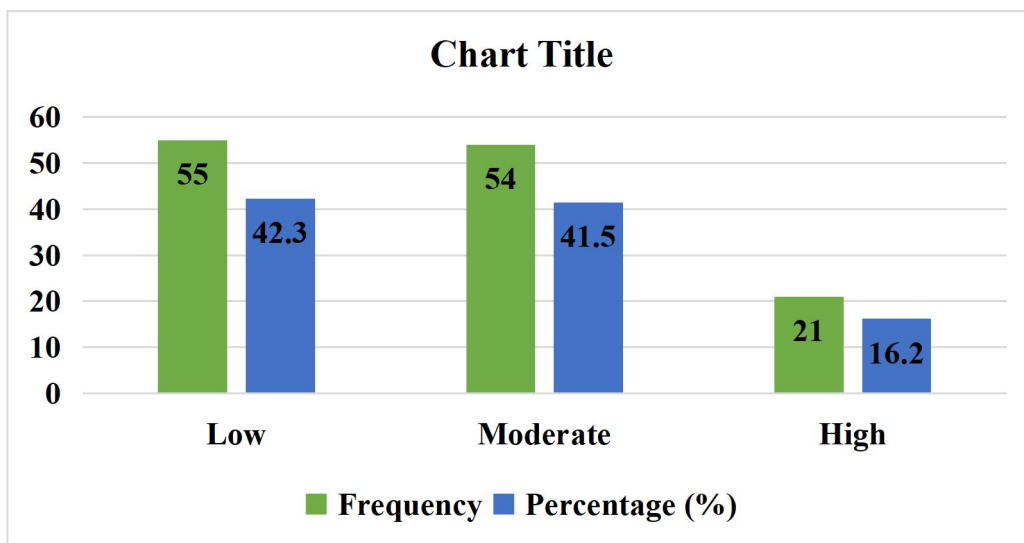


Figure 1: Knowledge Level Distribution

Slightly more than half of participants (53.1%) demonstrated a positive attitude toward needle stick injury prevention. A strong majority recognized the importance of reporting injuries and safe disposal practices. Most participants disagreed with prioritizing patient care over their own safety, reflecting awareness of occupational health importance. Despite this, a considerable proportion showed neutral or negative attitudes in some areas, and fear levels regarding injuries were relatively low, suggesting underestimation of risk.

Table 3: *Attitude Toward Needle Stick Injury (n = 130)*

| Statement | Agree/Strongly Agree (%) |
|--|--------------------------|
| Injuries should be reported immediately | 73.1 |
| Needle stick injury is preventable | 73.1 |
| Proper waste disposal is necessary | 78.5 |
| Patient care more important than nurse safety (disagree) | 88.5 |
| Fear of needle stick injury (agree) | 14.6 |

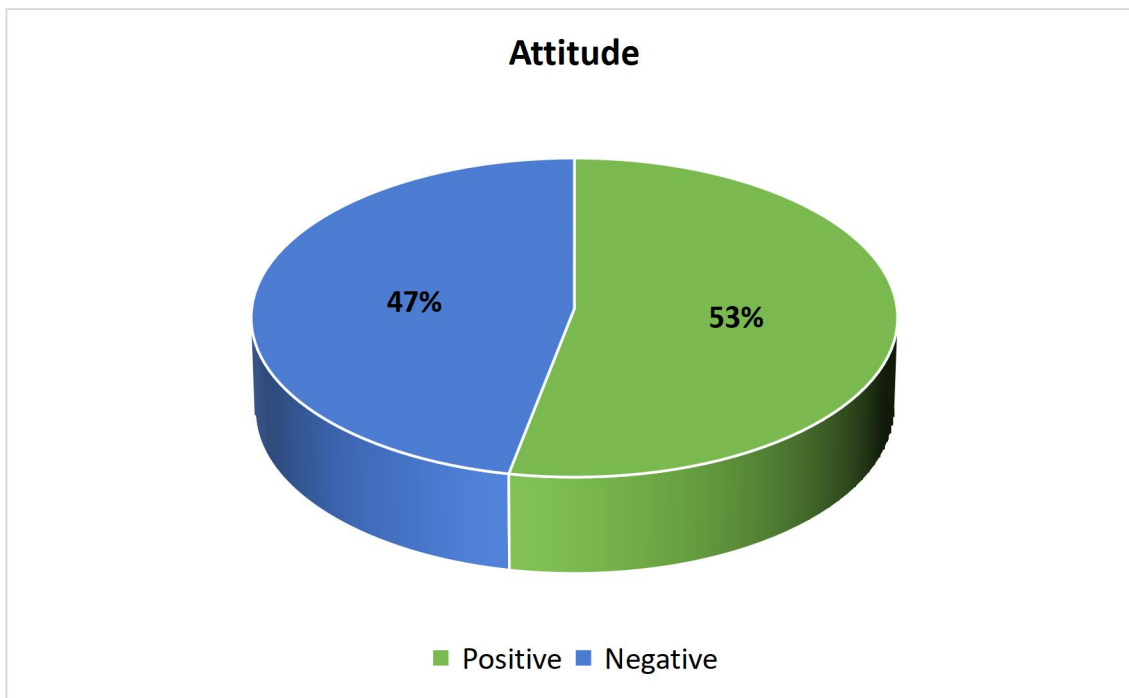


Figure 2: *Attitude Distribution of Participants*

Most participants (73.8%) demonstrated good overall practice regarding needle stick injury prevention. A high proportion reported receiving training (77.7%), which likely contributed to safer practices. Unsafe behaviors were still evident, including needle

recapping and improper disposal practices. Limited availability of safety boxes (68.5% reported absence) highlighted a systemic issue affecting safe practice. These findings indicate that while individual practices are relatively good, institutional support and resources require improvement.

Table 4: *Practices Regarding Needle Stick Injury (n = 130)*

| Practice Indicator | Yes (%) | No (%) |
|---------------------------------------|---------|--------|
| Recapping needles with two hands | 49.2 | 50.8 |
| Bending needles before disposal | 40.8 | 59.2 |
| Availability of safety boxes | 31.5 | 68.5 |
| Proper disposal in assigned container | 41.5 | 58.5 |
| Received training on safe devices | 77.7 | 22.3 |

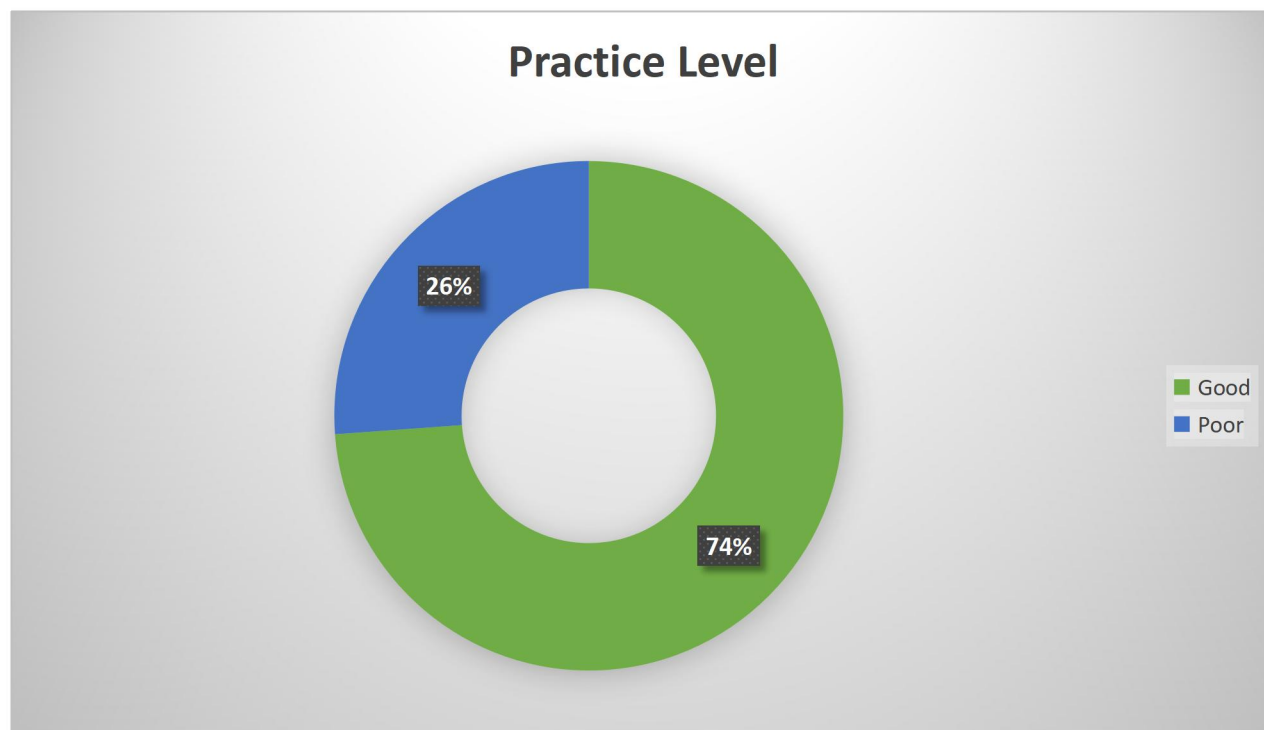


Figure 3: *Practice Distribution of Participants*

Discussion

This study assessed the knowledge, attitude and practice (KAP) of nurses around needle stick injury (NSI) and found a combination of positive and negative results. Most respondents were young adults (26-30 years) and females, which is consistent with the demographics of the nursing population. This is consistent with other studies, where nurses were predominantly female and in the early to middle stages of their career

(Siddique et al., 2018). The experience level of the participants in this study indicates that a large number of nurses were in the mid-experience range, which can affect their competence and vulnerability to occupational risks.

This study showed that nurses had adequate knowledge about the definition of needle stick injury and blood-borne pathogens. They were aware of the risks of contracting Hepatitis B, Hepatitis C, and HIV from these incidents. This is consistent with the study by Adal et al. (2023) that indicated good knowledge among health care workers regarding the risks of transmission of blood-borne pathogens. Awareness of Hepatitis B vaccination was also high, which is an indication of the successful education of basic infection control measures in healthcare.

There were some areas of inadequate knowledge, such as the belief about Hepatitis C vaccine and immediate post-exposure measures. A significant number of participants held incorrect beliefs, such as washing with plain water and misunderstanding of prophylaxis. These results are similar to Thakare and Koushal (2011) who found a lack of knowledge among nurses about post-exposure care. These gaps demonstrate a need for improvement in continued education and up-to-date training for nurses.

The nurses' perceptions of the prevention of needle stick injury was positive. The majority of respondents recognised the importance of reporting injuries immediately and believed that injuries are preventable. These findings are consistent with Bevan et al. (2023), who reported that health-care workers generally have a positive attitude towards safety practices and prevention. Understanding occupational safety and patient safety reflects the improved professionalism of nurses. Attitude showed some inconsistencies, especially in perceived risk and the fear of contracting infections. Many participants showed a lack of concern about needle stick injuries. This is in contrast to the perceptions of fear and vulnerability expressed by the health care workers in the study by Siddique et al. (2018). Reduced concern could result in complacency and a lack of safety practices in practice settings.

Our practice observations found that while most nurses had good practices, unsafe practices were also observed. Many reported unsafe practices such as recapping and incorrect disposal of needles. This is consistent with other studies that observed poor adherence to safety practices regardless of good knowledge (Siddique et al., 2018). The lack of safety equipment, such as disposal boxes, could be a contributing factor to unsafe practice in health care.

Most participants reported having received training, which may have affected their practice. This association between training and compliance has also been reported in

other studies, which found that the implementation of a training program improved safe sharps management (Bevan et al., 2023). The results suggest that while knowledge and attitude are acceptable, there is a gap in practice owing to behavioral and organizational issues. Ongoing training, effective policy and resource allocation are required to minimize the risk of needle stick injuries in nurses.

Conclusion

The study concludes that nurses demonstrated an overall moderate level of knowledge, generally positive attitudes, and mixed practices regarding needle stick injury prevention and management. Most participants were aware of the definition, risks, and major blood-borne infections associated with needle stick injuries, particularly hepatitis B, hepatitis C, and HIV, indicating satisfactory foundational knowledge. Some critical gaps persisted in areas such as immediate post-exposure actions and misconceptions regarding preventive practices, which reflect inconsistencies in knowledge application. Attitude findings revealed that a majority of nurses recognized the importance of safety, reporting of injuries, and prevention strategies, suggesting a favorable mindset toward occupational health. Practice findings indicated that although many nurses had received training and demonstrated good practices in some areas, unsafe behaviors such as improper disposal of sharps and limited availability of safety equipment remained significant concerns. These gaps highlight the need for continuous education, strict adherence to safety protocols, and improved institutional support to minimize occupational risks and enhance patient care quality.

Recommendation

The study recommends that continuous educational and training programs should be implemented for nurses to improve their knowledge regarding needle stick injury prevention, post-exposure management, and safe handling of sharps. Hospital administrations should ensure the availability of adequate safety equipment, including puncture-proof sharps containers and personal protective equipment, to promote safe practices. Strict policies and protocols should be enforced to discourage unsafe behaviors such as needle recapping and improper disposal. Regular workshops and refresher courses should be conducted to strengthen nurses' practical skills and update them on current guidelines. Reporting systems for needle stick injuries should be made more accessible and encouraged to ensure timely management and reduce underreporting. Healthcare institutions should also focus on creating a supportive work environment that prioritizes occupational safety and reduces workload-related risks. Further research is recommended on a larger scale to explore additional factors

influencing knowledge, attitude, and practices among nurses regarding needle stick injuries.

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