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KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING NEEDEL STICK INJURY AMONG HEALTH CARE WORKERS AT TERTIARY CARE HOSPITALS IN BANNU, KHYBER PAKHTUNKHWA PAKISTAN

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ABSTRACT

Background: *Needlestick injuries (NSIs) are critical occupational hazards for healthcare workers (HCWs) worldwide, leading to significant risks of transmitting bloodborne pathogens like hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV). Despite preventive measures and safety protocols, NSIs remain prevalent, particularly in resource-limited settings like Bannu, Pakistan. This study aims to explore knowledge, attitudes, and practices (KAP) regarding NSIs among HCWs in tertiary care hospitals in Bannu.*

Objective: *To assess the knowledge, attitudes, and practices of HCWs concerning NSIs and identify gaps to propose effective preventive strategies.*

Methodology: *A cross-sectional descriptive study was conducted from May to August 2022 among 226 HCWs in tertiary care hospitals in Bannu. Convenience sampling was used, and data were collected through structured questionnaires in English and Urdu. Data analysis was performed using SPSS version 20.0, employing descriptive and inferential statistics, including the Chi-square test, with a significance level of $p < 0.05$.*

Results: *The study had a 99.6% response rate. Among participants, 58.5% were male, and 41.5% were female. A significant proportion (55%) correctly identified the definition of NSIs, while 36.7% linked recapping needles to their occurrence. Only 38.6% of participants were aware of hospital protocols for managing NSIs. The majority (75.3%) recognized the risk of bloodborne infections due to NSIs. Nurses with 6–10 years of experience demonstrated better knowledge and practices, reflecting the positive influence of experience on competency.*

Conclusion: *Despite awareness of the risks associated with NSIs, gaps in adherence to safety protocols, reporting, and practice persist among HCWs. This study underscores the need for regular training, improved safety protocol dissemination, and fostering a safety culture in healthcare institutions to mitigate NSI-related risks and enhance HCWs' safety.*

Keywords: *Needlestick injuries, occupational hazards, healthcare workers, knowledge, safety practices, Bannu, Pakistan.*

INTRODUCTION

NSSI is a significant risk factor for blood-borne infections in a healthcare setting. Globally, out of 39.5 million healthcare workers (HCWs), about 3 million experience NSSIs each year. Such injuries can lead to the potential transmission of more than 20 blood-borne pathogens, including HBV, HCV, and HIV. It has been reported by the World Health Organization (WHO) that 40% of HBV infections, 2%–3% of HIV infections, and 40% of HCV infections in HCWs were acquired through workplace exposure to sharps. The probability of acquiring acute infection following a single needlestick is about 15%, whereas for HBV-containing needle-sticks, it ranges from 6% to 30%. The occupational transmission rate of HIV is reported at 0.3% following percutaneous exposure and 0.09% following mucosal exposure. Prevention of NSSIs: It is an important public health issue in India, where access to safer sharps devices with inbuilt safety remains abysmally low. Research on injection practices shows that more than half of healthcare professionals who engage in injecting practices reported at least one needlestick or sharps injury (NSSI) in the previous year; this is mainly because of unsafe practices such as two-handed needle recapping. The purpose of this study is to assess the knowledge, attitude, and practice among health care workers about blood-borne pathogen protection, including standard isolation precautions, double gloving, and post-exposure prophylaxis (1).

Needlestick injuries (NSIs) are among the most significant occupational hazards faced by all healthcare workers worldwide. The World Health Organization states that over two million sharp-related injuries occur annually among 35 million healthcare workers globally, increasing the risk of transmission of more than 20 infectious diseases, including hepatitis B (HBV), hepatitis C (HCV), and HIV. In the United States, data from the CDC and EU-OSHA report that over 385,000 hospital-based healthcare workers suffer from NSIs annually in that country. For Europe, it is assessed to be more than one million. WHO evaluates that NSIs account for about 16,000 HCV cases, 66,000 HBV cases, and 1,000 HIV cases annually among healthcare workers. Factors that affect the incidence of such infections include vaccination coverage, availability of protective gear and post-exposure prophylaxis, and compliance with infection control precautions. The NSIs are also reported differently among the different health care professionals. Nurses, surgeons, and workers in emergency departments have a higher risk of NSIs (2).

According to the CDC, a needlestick injury is a puncture wound from a hollow-bore needle or other sharp object contaminated with blood or other body fluids. The CDC estimates approximately 385,000 sharps-related injuries that occur annually in hospitals among healthcare workers. According to WHO, NSIs account for the greatest numbers of hepatitis B at 37.6%, hepatitis C at 39%, and HIV/AIDS with 4.4% among healthcare workers worldwide. Sharps invasive procedures always leave health care providers exposed to higher risks of blood-borne pathogens, with HBV, HCV, and HIV being the most concerning. NSIs include injuries caused by sharp objects including blood collection needles, hypodermic needles, intravenous cannulas, and components of the IV delivery system.

WHO estimates that about 16 billion injections are given worldwide annually, of which 90% are for therapeutic purposes and 5% for immunization. The incidence of NSIs among health care workers varies annually between 0.2 and 4.7 injuries per year worldwide. However, in India, there is no national surveillance network, and no standardized method exists for collecting data on the sharp injuries, which is quite another challenge (3).

Accidents involving needlestick and sharps injuries (NSIs/SIs) constitute a significant hazard of occupational nature for HCPs and pose a serious risk of transmitting blood-borne pathogens, including HBV, HCV, and HIV. The risk of transmission is highest for HBV (6%–30%), followed by HCV (1.8%) and HIV (0%–10%). Most NSIs are preventable, so the understanding of circumstances under which such injuries occur is extremely important to make an appropriate preventive strategy available. Those trainees in health sciences are mostly at risk for NSIs during training as they are largely inexperienced and technically inept. The review of various health science curricula has also shown that most of them are deficient in their approach to infection control and preventive measures against NSIs. Prevention mostly depends on instrument handling, adherence to precautionary protocols, and proper knowledge of PEP. Investigations on the incidence of NSIs have looked into different dimensions, that is, incidence, associated risk factors, perception of risk, circumstances leading to injuries, and types of injuries. Institution-based studies have also shown a strong need for health student education. Knowledge deficits and the gap between theory and practice can be used as a guide for developing

holistic healthcare curricula and preventive policies concerning NSIs. Only few studies compared health training in specialties to contrast variations in the prevention and management of NSI (4) . Needlestick injuries are a critical concern worldwide to healthcare workers, who face occupational exposure to over 20 pathogenic viruses and viral transmission agents that include human immunodeficiency virus and hepatitis B and C viruses. The National Surveillance System for Healthcare Workers defines an NSI as any percutaneous injury or skin penetration caused by a needle or sharp object contaminated with blood, tissue, or bodily fluids. The CDC, U.S. Centers for Disease Control and Prevention, estimates between 600,000 and 1,000,000 NSIs each year. Contributing risk factors associated with NSIs include inappropriate utilization of protective equipment, for example wearing gloves that do not fit appropriately, working in high-risk departments, including surgical or intensive care units, limited work experience, relatively younger age, and poor knowledge of blood-borne infections. Recapping, inadequate disposal of needles and cannulation for IV, and drip settings are some of the most common causes of NSIs, according to several studies. Prevention of NSIs is essential not only for the protection of HCWs but also to prevent unnecessary post-exposure laboratory testing, expensive prophylaxis, and treatment for suspected infections. However, many of the developing countries have a lack of understanding surrounding the risks for NSIs, as well as the practices that lead to their occurrence, indicating a need for improved awareness and adherence to the prevention protocols (5).

Sharps injuries and needlestick injuries (NSIs) continue to be significant workplace hazards for healthcare workers (HCWs), exposing them to various bloodborne pathogens that carry a significant risk of spreading infectious illnesses. This include viruses such as the human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HCV). NSIs persist, despite implementation of preventive measures, such as equipment design improvements and training programs, at all stages of handling sharp devices, like their usage, disassembly, or disposal. According to the U.S. Occupational Health and Safety Administration (OSHA), an estimated 5.6 million HCWs are at risk of occupational exposure to bloodborne pathogens through NSIs. Sharps injuries can occur in any situation where HCWs are exposed to sharp objects that may puncture or cut their skin. These injuries, by devices such as needles, scalpels, blades, and scissors, may initially be minor but carry a high potential for severe consequences. Exposed instruments contaminated with blood or body fluid entering through a break in the skin of HCWs create a high risk of exposure to infectious and hazardous materials (6). According to estimates, 2 million healthcare workers (HCWs) suffer from needlestick and sharps injuries (NSIs) annually, making them an occupational hazard. Because they often deal with patients who have bloodborne viral infections such the hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), hospital staff are especially at risk for NSIs. NSIs are thought to be responsible for 4.4% of HIV infections, 39% of HCV infections, and 37% of HBV infections among HCWs. Prophylactic measures, including post-exposure zidovudine, have been proven to prevent HIV transmission by 81%. While prophylaxis for HCV does not exist, early diagnosis and treatment may prevent progression to chronic infection. Important preventive measures against NSIs are education of HCWs on occupational risks, providing safe working environments, and implementing use of safety-engineered devices, such as shields and retractable needles. Reporting NSIs promptly is essential in allowing prophylactic treatment to begin in good time, follow-up to be adequately achieved, and legal or compensation processes initiated in a timely fashion. But underreporting persists as a problem with possible serious consequences for HCWs and healthcare systems. Yet despite the associated risks, non-reporting of NSIs remains a common and alarming phenomenon (7).

Needlestic injuries (NSIs) are serious occupational hazard for healthcare staff, in particular, nurses, causing accidental penetration of skin by needles. Although preventable, a needlestic injury exposes individuals to more than 20 bloodborne pathogens among which comes hepatitis B, hepatitis C, and human immunodeficiency virus (HIV). Over two million healthcare workers face the threat of exposure to infections annually. Furthermore, NSIs have been said to contribute to the transmission of diseases, such as diphtheria, herpes, malaria, and syphilis. Beyond the immediacy of physiologic risks, NSIs may result in psychological outcomes, such as post-traumatic stress disorder and significant emotional distress for patients. These injuries not only impact the individual's wellness but also contribute to fear and anxiety, thus potentially lowering the quality of care provided. The ramifications of NSIs—entailing clinical, economic, and human factors—highlight the significance of preventive measures.

The direct and indirect cost burden of NSIs is especially high in resources-constrained healthcare systems, as in Iran. However, the expenditure of preventive measures is relatively low and serves as a contrast that underscores the cost-effectiveness of investing in prevention programs for managing the global fallout from the occurrence of NSIs (8).

Aim Of The Study

The study's objective is to ascertain healthcare personnel' knowledge, attitudes, and practices about needle stick injuries.

OBJECTIVES

- To assess the level of knowledge regarding needle stick injury
- To identify and evaluate the attitudes towards needle stick injury
- To examine the current practices related to needle stick injury

Significance

This KAP study on needlestick injuries (NSIs) among the healthcare workers (HCWs) in the tertiary care hospital in Bannu, Pakistan, is imperative, as this under-resourced region indeed possesses unique healthcare challenges. The risk of NSIs in HCWs is higher in Bannu, as the threat of severe bloodborne pathogens such as HIV, HBV, and HCV is high as a result of inadequate training resources and awareness. It would gauge HCWs' knowledge about preventive measures-in this regard, safe needle handling, hepatitis B vaccination, and PEP. It would then identify key deficiencies interfering with effective prevention. Attitudes toward NSIs, including risk perceptions, the supportiveness of institutions regarding safety measures and barriers to reporting, including fear of stigma or punitive actions, which cultural and systemic factors can exacerbate, would be assessed. In addition, daily safety practice compliance assessments, including protocol adherence, the use of PPE, and sharps disposal, would show the impact of resource constraints and workplace conditions on compliance. Findings from this study could help inform targeted training programs, strengthen institutional policies on prevention and reporting, and promote a safety culture, thereby reducing the incidence of NSI, protecting HCWs, and more generally improving healthcare service delivery at Bannu.

Operational Definitions

- **Knowledge about Needle Stick Injury**
  Healthcare workers' understanding and awareness of the etiology, risk factors, prevention, and post-exposure management of needle stick injuries.
- **Attitude towards Needle Stick Injury**
  Perceptions, beliefs, and feelings of healthcare workers towards preventing, reporting, and managing the needle stick injuries.
- **Practice Regarding Needle Stick Injury**
  Actual behaviors and practices of health care professionals regarding prevention, management, and reporting of needle stick injuries.

Literature Review

A cross-sectional study based on a self-administered questionnaire was carried out in 2019 among interns and nurses in diverse departments at a tertiary care center in Kerala, India. The participants included 100 interns and 100 nurses, of whom 42 (95.5%) were male interns and 58 (37.2%) were female interns, while 98 (62.8%) of the nurses were female. The mean age of interns was 24.38 ± 1.21 years and that of the nurses, 33.77 ± 7.16 years. There was a statistically significant difference between the two groups in terms of age (P value < 0.001). Interns had more knowledge regarding the proper meaning of needlestick injury (NSI) (61%), standard precautions (57.1%) than the nurses. While 58.4% of the nurses revealed that not recapping was the most important preventive measure against NSI, the interns only agreed to this 41.6% (P value < 0.002). Moreover, only 38% of the interns knew that they should report NSI, and 42.7% of them disposed of their

needles appropriately (P value < 0.001). The interns were fewer users of personal protective equipment (PPE), especially gloves, than the nurses; 73.8% of interns practiced recapping needles (P value < 0.001). The study showed a prevalence of 75.6% of NSIs among interns during their 12-month internship, whereas 53.9% of them reported multiple incidents as compared to the incidence in nurses that was significantly less at P value < 0.001. The most common cause of NSI among interns was blood withdrawal at 42% and recapping at 29%. Generally, nurses had a better knowledge and adherence to NSI prevention practices(9).

This was a retrospective study among HCWs between October 2018 and October 2019 to establish the incidence and causes of needlestick injuries (NSIs). Data was obtained upon self-reporting, which included mode of injury, viral markers of the source as well as the HCWs, and vaccination status. The exposed HCWs were then followed up for seroconversion over six months. There were 47 cases of reported NSIs. The annual incidence rate was 0.13. The highest incidence was seen in ICUs at 47% of the total, while needle recapping was the most common cause (36.2%). For the 12 cases where sources were tested for viral markers, six tested positive for HBV, five for HIV, and one for HCV. Among four fully vaccinated HCWs exposed to HBV-positive sources, two had anti-HBV antibody titres below 10 mIU/ml. No seroconversions were observed during the follow-up period (10).

In 2019, a prospective, questionnaire-based, cross-sectional survey was conducted among personnel employed at three EMS service providers in Johannesburg. A total of 93 NSIs were reported among 63 (26.3%) participants. Of these, 41 (65.1%) had experienced one previous NSI, 16 (25.4%) had two NSIs, five (7.9%) had three NSIs, and one (1.6%) reported five NSIs. Nearly two-thirds (n = 60; 64.5%) of NSIs occurred during intravenous line insertion. The distribution was predominantly male (n = 145; 60.4%), aged between 25–29 years (n = 67; 27.9%), having a BLS qualification as their highest level of training (n = 89; 37.1%), and with more than 10 years of EMS experience (n = 69; 28.8%). The majority of participants had all their Hepatitis B vaccinations up to date at the time of the study. HIV PEP was started in 82 (88.2%) out of the 93 incidents of NSI, but only 68 (82.9%) of them completed the 28-day treatment course (11).

A cross-sectional study was conducted from June to November 2019 at a tertiary care hospital of Northern India after taking approval from the institutional ethics committee. The census method was used for recruiting participants. Thus, findings were found that 66.7% of nursing staff faced needlestick injuries during their duty hours. Multivariate binary logistic regression revealed a significant association between NSIs and both the setting of the workplace and the level of education of the nursing staff. Furthermore, 26% of the nurses were not aware of whether recapping used needles was appropriate, and 35% reported recapping needles after use (12).

This cross-sectional study, conducted between August 1, 2019, and February 15, 2020, involved 786 healthcare workers in Abha City, Saudi Arabia. Data were collected using a structured questionnaire. The incidence of needlestick injuries (NSIs) over the previous 12 months was 11.57% (91/786), with nurses, females, and Saudi nationals reporting the highest rates. More than half (52.7%) of these injuries were not reported. Most NSIs occurred during the use of sharp devices (52.7%) and in patient rooms (42.9%). The incidence was significantly higher among those working in secondary healthcare settings (p = 0.003) and those involved in surgical practices (p < 0.001). Among the participants, 94.7% were familiar with the definition of NSI, and 81.0% were aware of the procedures and guidelines for managing such injuries. However, only 61.2% understood that needle recapping is not recommended. Nearly half (47.1%) agreed, and 33.6% strongly agreed that NSIs are preventable. The majority (89.1%) were vaccinated against Hepatitis B. Despite this, 27.5% of healthcare workers practiced recapping needles with two hands, and 8.7% bent needles before disposal. Needle recapping was significantly more prevalent among those with a history of NSIs (p = 0.04) (13).

In 2020, a cross sectional survey was carried out among the staff in charge of processing and handling laboratory samples in prominent public and private clinical laboratories in Sana'a city. Data collection was done through a semi-structured questionnaire subdivided into three sections. The first section included sociodemographic characteristics of the study participants, the second section explored the question of PPE availability, such as lab coats and gloves, and the third mainly dealt with work-related injuries and HBV

vaccination status. Incidences of work-related accidental injury: Of the 362 participants, 219 (60%) reported having experienced accidental injuries at work. The three months preceding data collection were the time of such incidents for 14.6% (32/219) of the injured participants. The biosafety manual receipt was significantly related to lower risk of injury. First aid was received by 54.8% (120/219) of the injured participants. Almost three-quarters of the participants claimed to have been vaccinated against HBV. Significantly, the HBV vaccination rate was higher among laboratory staff working in private laboratories (P = .01), those with postgraduate qualifications (P = .005), and those who received the biosafety manual (P = .03). (14).

A cross-sectional study was conducted in the year 2020 at a public and a private tertiary care hospital in Lahore, Pakistan, with the selected female nurses selected through non-probability purposive sampling. Data was collected on structured questionnaires using the SPSS version 17 for analysis. In this study of 386 participants, 193 (50%) were from each hospital. The public hospital had a prevalence rate of 44% (85 nurses) for NSIs, while the private hospital had a prevalence rate of 26.4% (51 nurses). Most cases in these hospitals occurred when handling needles during disposal or recapping: in the public hospital, this was applicable to 36 cases (42.4%), and in the private hospital, to 32 cases (62.7%). Incidents were more common in the morning shift, where 42 (49.4%) cases were reported in the public hospital and 32 (62.7%) in the private hospital.(15). A study was conducted in the year 2021 at Yekatit 12 Hospital Medical College, Addis Ababa, a teaching hospital under the Addis Ababa City Administration Health Bureau. A total of 297 self-administered questionnaires were distributed to the hospital's nursing staff, with 257 fully returned, and the response rate was 86.5%. The rest, 13.5%, were excluded based on incomplete responses, less than a year of experience, or other workplace factors that interrupted filling out the questionnaire. The majority of respondents fell within the age group of 26–30 years (138 participants, 53.7%), and 176 (68.5%) were female. Most were degree-holding nurses (150 participants, 58.4%), followed by diploma nurses (64 participants, 24.9%). Additionally, 162 (63%) were unmarried, and 178 (69.3%) had less than five years of clinical experience. The largest group of participants worked in wards (62 participants, 24.1%), and 199 (77.4%) were on regular eight-hour shifts. Further, 108 respondents (42%) indicated that there were 10–20 injections per day per nurse (16).

In 2021, among 219 male and female nurses working in general and critical care units of a government hospital in Jeddah, Saudi Arabia, a cross sectional descriptive quantitative study was conducted. Results showed a prevalence of 19.7% of needlestick injuries, where 72.3% had one needlestick injury and 38.3% by a syringe needle. Reporting to the authorities 79.2% reported the injury to the concerned authority, while 37.5% did not report their injury, deeming it unimportant. Seeking medical care Most participants (83%) sought medical care following their injuries. Sustains of NSIs were most common during the night (36.2%) and in well-lit lighting conditions (55.3%). About 23.9% recap pins alone at the time of injury, and 93% wear personal protective equipment. While about 84.1% wore a single glove during procedures, 51% performed 5–10 injections daily. Most respondents (86.2%) had undergone training on the issue of NSI, and almost all of them (99.1%) were aware of the specific risks to health attendant upon the transmission of diseases. Among the respondents, familiarity with hospital NSI policies was reported at 98.6%, followed by reporting systems (95.9%), and at the injection site, the availability of sharps containers was reported at 99.5%. Furthermore, 98.6% of the needles disposed off immediately in sharps boxes, 97.7% practiced universal precautions, and 85.3% observed enough protective equipment in their workplace. This study further indicated that though the prevalence of NSIs was at 19.7%, high compliance among nurses in Jeddah is highly noted for safety protocols (17).

Simple random sampling was done between March and August 2022 to enroll 360 female registered nurses directly engaged in the care provision process in Nishtar Teaching Hospital, Multan. The structured, quantitative manipulative questionnaire was utilized for data collection, and SPSS version 20.0 was applied to analysis. The Chi-square test was applied to assess the link between nurses' knowledge regarding needle-stick injuries and their safe practices at a preset significance level of $p < 0.05$. There were findings of 48.9% of the nurses having proper knowledge about needle-stick injuries, and 46.8% followed current safety standards. Major of them (76.6%) understood that needlestick accidents are percutaneous injuries;

however only 57.8% understood that they transfer blood-borne pathogens. About half of them believed that needlestick injuries are inevitable. A strong correlation between nursing competency and age was observed in that the question with the highest Chi-square value was "Do needlestick injuries cause the spread of pathogens? Nurses with 6–10 years experience had the best knowledge and practice, which implies that the length of service positively impacts experience. Such findings point out the necessity of structured interventions to increase awareness and adherence to needle-stick safety practices among nurses at different levels of experience.(18)

From May to August 2022, this was a cross-sectional study on a sample of medical ward nurses working in a public hospital in Kuala Lumpur, Malaysia. Convenience sampling was used, and 208 subjects were recruited. A questionnaire that assessed knowledge and attitudes about NSI was used to collect data. It had strong test-retest and internal consistency reliability.

The majority of the participants were female, 82.7%, with over five years of experience at work, 50.5%, and were diploma holders, 92.3%. Most nurses were vaccinated against Hepatitis B, 96.6%, and had hospital occupational health services, 91.8%. A high level of knowledge regarding NSIs was reported, though there was no significant association between knowledge and attitudes towards NSIs ($p = 0.125$). (19)

A cross-sectional study was conducted over three months in 2024 at a tertiary care hospital in Surat on 300 participants which included intern doctors, postgraduate resident doctors, staff nurses, and laboratory technicians from a government medical college and hospital. Data were collected through a self-administered questionnaire distributed through Google Forms developed after reviewing the literature. Analytical work was done in Microsoft Excel. NSI prevalence was 46%, with postgraduate residents reporting the highest (72%). Despite higher knowledge scores by postgraduate residents (knowledge score > 7 in 71% of the respondents) and favorable attitudes towards NSI prevention (attitude score > 7 in 68%), they still account for most of the NSIs due to low practice scores. Among the 139 people who reported NSIs, 70% had superficial injuries. However, only 9% of them formally reported the incidents, 18% sought attention within two hours, and 7% followed up to monitor their viral marker status. Many of the injuries occurred while recapping hypodermic needles and point to an evident gap between knowledge and practice (20).

Methodology

Reserch Design And Setting

Convenience sampling was used in conjunction with a cross-sectional descriptive approach in this study. Healthcare workers (HCWs) at tertiary care facilities, including as Bannu's Women and Children Hospital, DHQ Hospital, and KGN Hospital, provided the data.

Population & Sampling

Healthcare professionals from Bannu's tertiary care facilities, both male and female, made up the study population. The number of registered nurses employed by these hospitals was used to calculate the sample size. A sample size of 226 was determined using the WHO sample size calculator, assuming a 50% response distribution, a 95% confidence level, and a 5% margin of error.

Incusion And Exclusion Criteria

Inclusion Criteria

- Only healthcare professionals, including doctors, nurses, midwives, laboratory technicians, phlebotomists, and surgical staff, will be included.
- Healthcare workers who are actively engaged in clinical duties, including the administration of injections, blood sampling, handling of sharps, or performing surgical procedures.
- Participants must have been employed at the tertiary care hospital for at least Six months.
- Only healthcare workers who voluntarily agree to participate in the study and sign the informed consent form will be included.

Exclusion Criteria

- Healthcare workers in non-clinical roles, such as administrative personnel, IT staff, housekeeping, and managerial staff, will be excluded.
- Healthcare workers who are on or have recently returned from extended leave (e.g., maternity leave, sick leave, sabbatical) during the study period will be excluded.
- Healthcare workers who have participated in similar studies within the past year will be excluded.

Data Collection

Data were collected through a Google form questionnaire prepared in both English and Urdu languages. All participants were informed about the objectives of the study, risk, benefit, and the assurance of complete confidentiality before taking their respective informed consents. Permission for collecting data has been taken from the Government College of Nursing Bannu, and further authorization was attained from the concerned in-charge personnel of the tertiary care hospital where they are working. Contact was made with supervisors to inform nurses about the study, and participants were approached during various shifts. Those agreeing to participate provided their consent, and the adopted questionnaire, including sections on demographics as well as knowledge, attitudes, and practices regarding needle-stick injuries among healthcare workers, was filled out.

Data Analysis

Data were collected using a Google form questionnaire, which automatically generated graphical representations of the findings. To ensure data quality, each completed questionnaire was personally reviewed. The collected data were then compiled and integrated into graphs for the variables using Excel.

Results

While just one respondent declined, 99.6% of the 226 respondents consented to participate willingly in the study, indicating a high degree of consent and comprehension of the goals, purpose, and confidentiality measures of the research.

Demographic Characteristics

A survey of 226 individuals, with 99.6% providing consent, revealed a diverse demographic. The age distribution showed 46% were 20-30 years old, 35.4% were 30-40 years old, 16.6% were 40-50 years old, and 3.5% were 50-60 years old. Males made up 58% of the respondents, while females comprised 42%. The marital status was 53.1% married, 43.3% single, 2.7% widowed, and 0.9% divorced. In terms of healthcare experience, 15% had 0-1 year, 50% had 2- 5 years, 26.5% had 6-10 years, and 7.1% had above 10 years of experience, indicating a range of perspectives among the participants.

Figure 1: gender of the participants

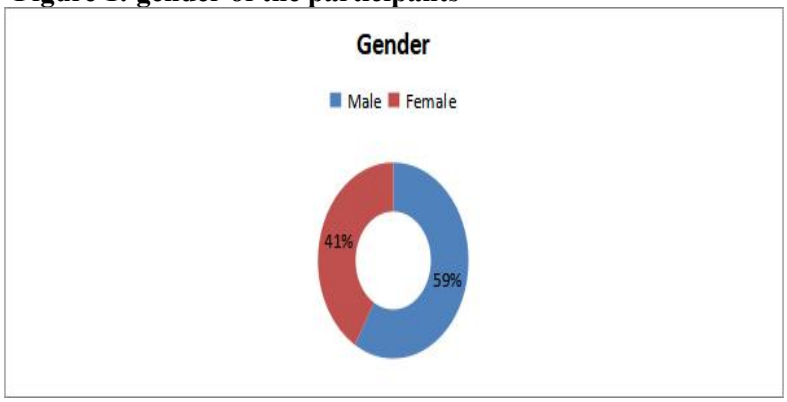


Table 2: sociodemographic patterns

Profile	Category	Frequency	Percentage
Age (years)	20-30	107	46.7%
	30-40	80	34.9%
	40-50	33	14.4%
	50-60	08	3.5%
Gender of respondent	Male	134	58.5%
	Female	95	41.5%
WORK EXPERIENCE	Less than 1 year	37	16.2%
	1 to 5 years	113	49.3%
	6 to 10 years	60	26.2%
	More than 10 years	16	7%
Marital Status	Single	101	44.1%
	Married	120	52.4%
	Divorced	02	0.9%
	Windowed	06	2.6%

Figure 2: level of education

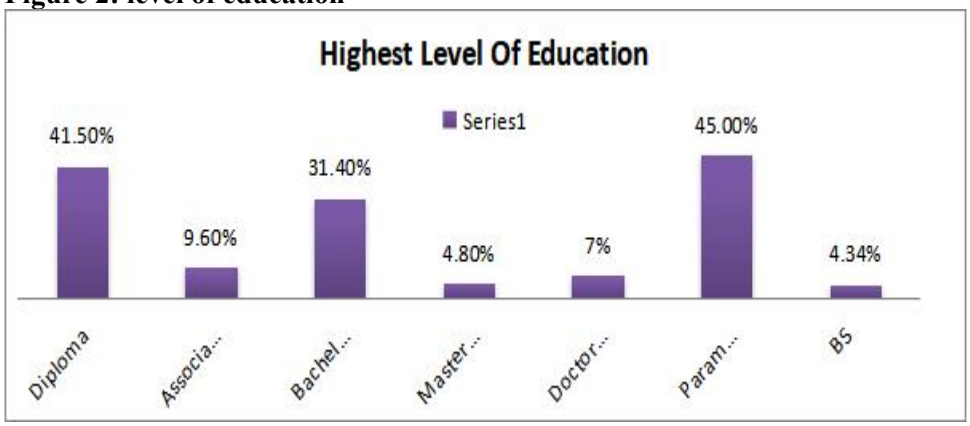
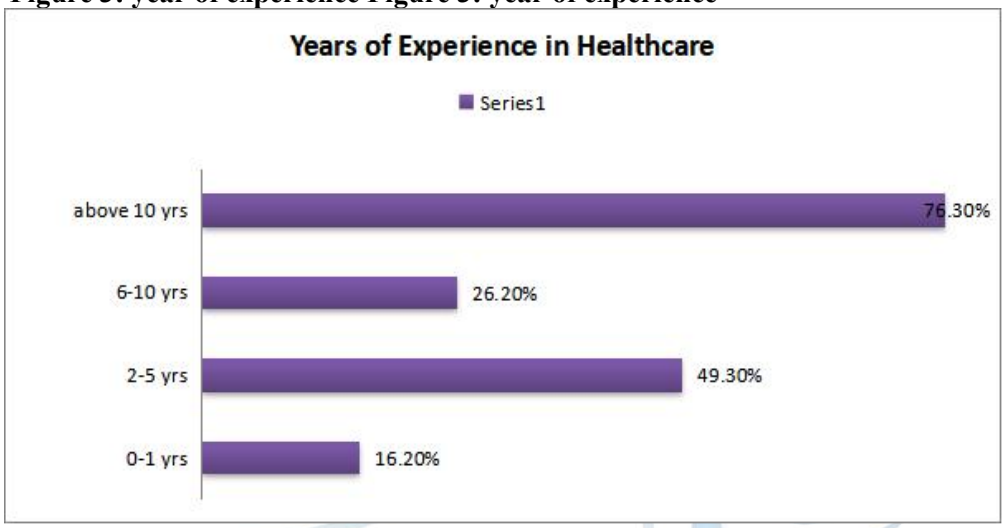


Figure 3: year of experience Figure 3: year of experience



Knowledge of Needle Stick Injuries among HCWs

A needle stick injury (NSI) is defined as an injury caused by a sharp object that penetrates the skin, with 55% of respondents identifying this as the correct definition. NSIs can occur due to various reasons, including recapping needles (36.7%), disposing of needles improperly (33.2%), handling sharps with bare hands (21.4%), and sudden patient movement during procedures (8.7%). After an NSI occurs, 63.3% of respondents believe one should report it and wash the area, while 24.9% think applying a bandage and continuing work is appropriate. However, 7.4% would ignore it, and 3.1% are unsure. Healthcare workers should receive training on NSI prevention annually (44.1%), while 25.8% believe it should be done only once in their career, and 15.7% think it should be done only if an injury occurs. A significant majority (75.3%) acknowledge that NSIs can lead to bloodborne infections, while 19.4% disagree, and 5.3% are unsure. Despite the risks, only 38.6% of respondents are aware of protocols or guidelines in their hospital regarding the management of NSIs, while 56.1% are not aware, and 5.3% are unsure.

Figure 4: Knowledge related to NSI among HCW

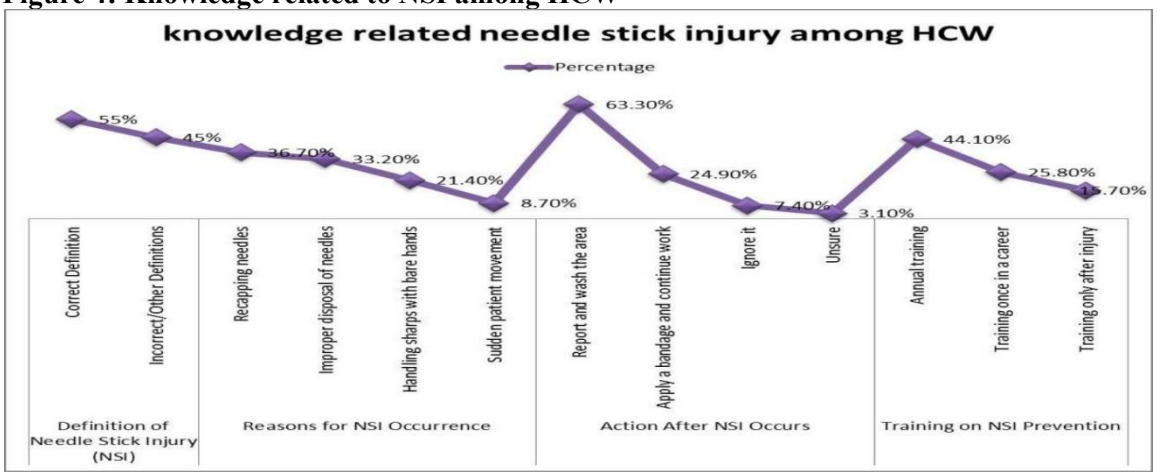
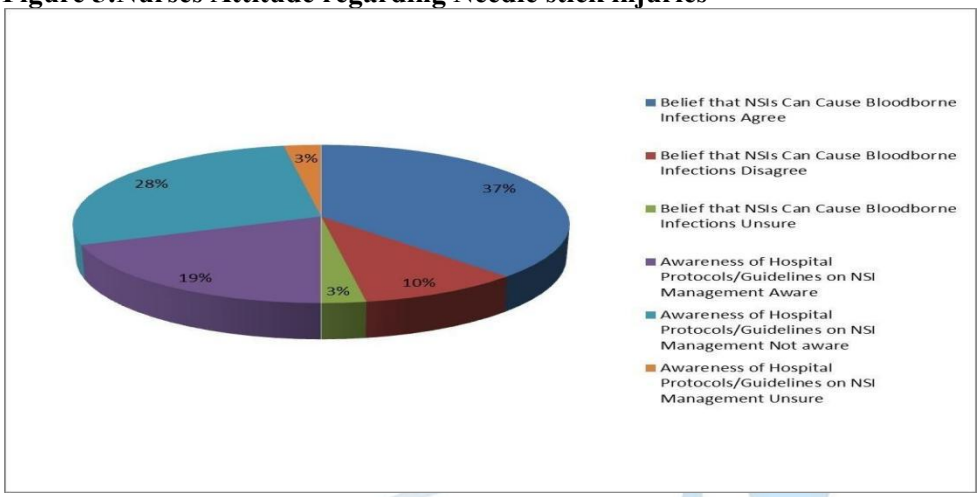
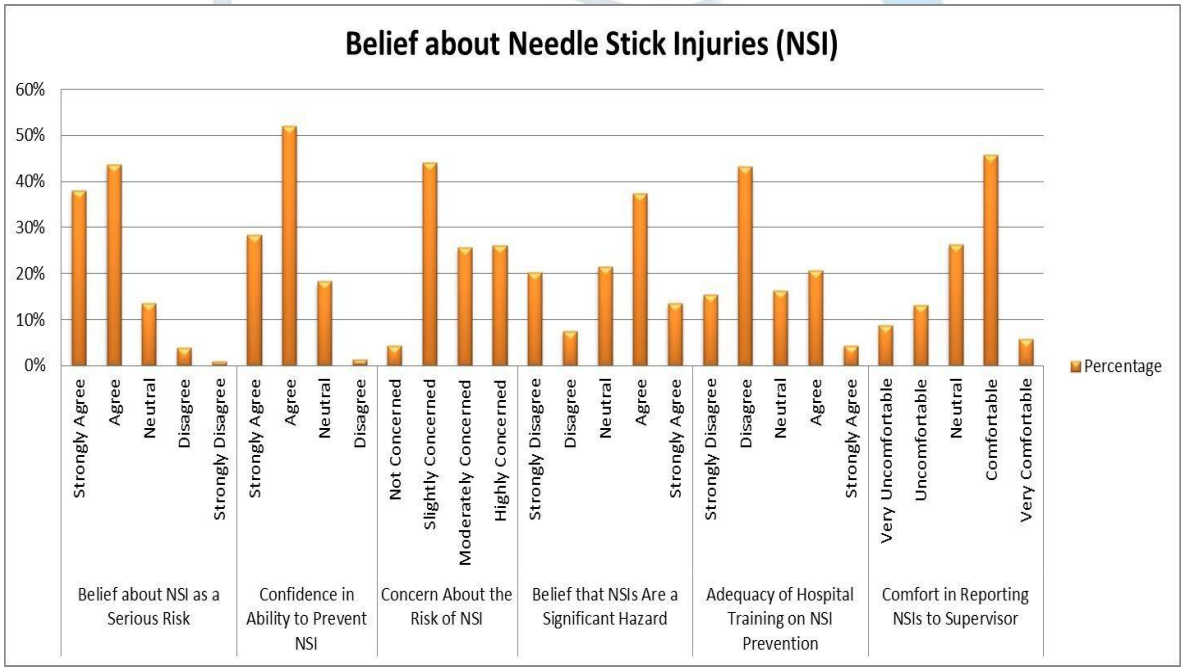


Figure 5:Nurses Attitude regarding Needle stick injuries



Despite the risks, only 38.6% of respondents are aware of protocols or guidelines in their hospital regarding the management of NSIs, while 56.1% are not aware, and 5.3% are unsure. Overall, NSIs pose a significant risk to healthcare workers, and proper prevention, reporting, and management are crucial to minimizing this risk. Regular training and awareness of hospital protocols can help reduce the incidence of NSIs and prevent bloodborne infections.

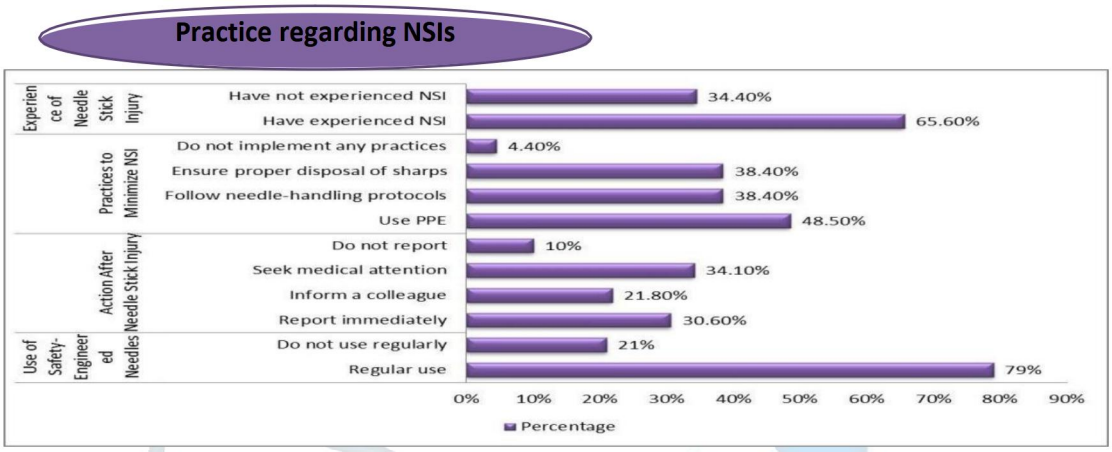
Figure 6: Attitude about NSI



Nursing Practice regarding Needle stick injuries

Regular training and awareness of hospital protocols can help reduce the incidence of NSIs and prevent bloodborne infections. A survey of 226 healthcare professionals revealed that 79% regularly use safety-engineered needles in their practice, while 21% do not. After a needle stick injury, 30.6% report it immediately, 21.8% inform a colleague, 34.1% seek medical attention, and 10% do not report it. To minimize needle stick injuries, 48.5% of respondents use personal protective equipment (PPE), 38.4% follow protocols for handling needles, and 38.4% ensure proper disposal of sharps. However, 4.4% do not implement any specific practices to prevent NSIs. Additionally, 65.6% of respondents have experienced a needle stick injury at some point in their career, while 34.4% have not.

Figure 7: Practice regarding NSI



Discussion

The results of the survey have highlighted critical information regarding NSIs occurring among doctors. This implies a deep need for continuous training and very high standards for adherence in the hospital system. Though 79% of respondents reported frequently using safety-engineered needles, the startling statistic of 65.6% who have experienced an NSI at some time in their careers casts doubt on the adequacy of existing safety measures. Such a disconnect seems to posit that mere use of advance safety devices alone is not enough, but rather a holistic system that incorporates the right training and reinforcement of guidelines must be in place. The reports about reporting injuries are very telling with only 30.6% of the people saying that they report their injuries immediately. It is quite clear that communication and accountability are quite deficient, which can catalyze these risks presented by NSIs. While a significant proportion of the respondents use personal protective equipment (PPE) and adheres to appropriate needle-handling protocols and disposal practices, not least, nearly 4.4% of them do not have any specific practices points to a cause for grave concern regarding safety adherence. The only way to effectively lessen the incidence of NSIs is through proper training that will stress reporting, proper utilization of safety devices, and a culture of compliance with established safety protocols within healthcare institutions.

Conclusion

In conclusion, the survey highlights both advancements and persistent challenges in the area of needle stick injury prevention within healthcare settings. The widespread use of safety-engineered needles reflects progress; however, the high prevalence of NSIs indicates that reliance on these devices alone is insufficient. The data shows significant gaps in reporting practices and adherence to safety protocols, underscoring the urgent need for enhanced training programs and cultural shifts within healthcare organizations. Establishing a robust framework for safety that encourages immediate reporting of injuries, along with consistent compliance with established protocols, is crucial for safeguarding the health of healthcare professionals and,

by extension, improving patient safety. Addressing these systemic issues is vital not only for reducing the incidence of NSIs but also for fostering a safer working environment in healthcare settings.

Limitations

One limitation of the survey is its reliance on self-reported data from healthcare professionals, which may introduce biases such as underreporting or overreporting of practices and experiences regarding needle stick injuries (NSIs). The variation in respondents' understanding of what constitutes a needle stick injury, along with differences in individual recall, can affect the accuracy of the reported statistics. Additionally, the survey sample, while comprising 226 healthcare professionals, may not represent all healthcare settings or professions, limiting the generalizability of the findings. Factors such as varying institutional policies, regional differences in healthcare practices, and the presence or absence of targeted training programs may also influence the results but were not accounted for in the survey design. Consequently, further research is needed to corroborate these findings across a more diverse sample and to explore the underlying factors contributing to NSIs in different healthcare environments.

Recommendations

To further enhance understanding and prevention of needle stick injuries, future research should focus on longitudinal studies that evaluate the effectiveness of targeted training interventions over time. These studies could measure changes in both the incidence of NSIs and improvements in reporting practices among healthcare professionals. Additionally, qualitative research is recommended to explore the specific barriers that healthcare workers face in adhering to safety protocols, which could provide critical insights for developing tailored interventions. Implementing regular workshops and refresher courses that emphasize the importance of compliance with safety protocols, alongside structured feedback mechanisms, will encourage staff engagement and accountability. Moreover, fostering a workplace culture that prioritizes immediate reporting of needle stick injuries will be essential in mitigating risks. By focusing on these strategies, healthcare institutions can significantly reduce the incidence of NSIs, ultimately leading to a safer environment for both healthcare workers and patients alike.

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