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Nurses' Knowledge and Practice Regarding Needle Stick Injuries at District Head Quarter Hospital and Shahida Islam Teaching Hospital Lodhran

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Abstract

Needle stick injuries (NSIs) are a significant occupational hazard for nurses, exposing them to bloodborne pathogens such as HIV, hepatitis B, and hepatitis C. This cross-sectional study assessed the knowledge and practices of 91 nurses at District Head Quarter Hospital and Shahida Islam Teaching Hospital Lodhran, revealing that while 65.93% had good knowledge of NSIs, 26.37% had poor knowledge, and 7.70% lacked awareness. Although 74.73% followed safe practices, 15.38% did not adhere to protocols, and underreporting remained prevalent due to fear, lack of awareness, and administrative barriers. The findings highlight the need for enhanced training, stricter safety measures, and institutional support to mitigate NSI risks and improve post-exposure management.

Keywords: Needle stick injuries, nurses, occupational hazards, bloodborne pathogens, infection control, healthcare safety.

Introduction

Nurses are often exposed to a large number and variety of work-related injuries. Nurses are at risk for needlestick injuries due to the use of needles in injections or IV therapy. It is a significant occupational hazard to nurses and has serious social, psychological, and physical consequences. It puts them at risk for contact with bloodborne pathogens like Human Immunodeficiency Virus and hepatitis C (Iskandar et al., 2020). Needlestick injuries are a global problem with serious consequences. To achieve patient satisfaction is a complex and multidimensional process requiring the use of physical, social, and mental health assessment with the goal of functional recovery. Patient satisfaction means addressing health care use in terms of disparities, continuations, use of services, and better methods to communicate with their providers. Although these methods are important in determining quality of care, so is prevention of possible injury. One example of an adverse event in surgery and invasive procedures leading to injury is a needle stick injury. Needle stick injuries are a common occurrence in health care settings. It is estimated that in the United States, needle stick injuries occur at a rate of 600,000 to 800,000 per year with approximately 385,000 personnel exposed to bloodborne pathogens. A needle stick injury can lead to exposure of the health care provider's blood and body fluids to a patient's blood and body fluids (Zarnigar et al., 2021; ElSawy & Mosa, 2020).This possible exchange in fluids is what leads to a high risk of infection between the provider and patient. It is for this reason that knowledge of needle stick injuries,

their prevention and practice of the correct procedures post-needle stick are vital to preventing adverse events in nursing care. Staff nurses in local hospital units are frequently faced with providing nursing care to a variety of patients, some of which may include new and unfamiliar medical diagnoses. These patients often require nursing care interventions employing the use of invasive procedures with potential for needle stick injury. In order to eliminate or prevent the occurrences of needle stick injuries, it is important to assess a nurse's knowledge of these injuries and their related practices in order to develop interventions to improve their understanding of prevention and action in the case of an injury (Mohamud et al., 2023).

An understanding of the nature and experiences of these injuries will enable researchers to ultimately design feasible and effective strategies to decrease the risk of needle stick injuries and protect the nurse from exposure while providing patient care. Expanding on the importance of patient satisfaction, it plays a vital role in the overall success of healthcare systems. Achieving patient satisfaction requires healthcare providers to go above and beyond their duty, employing various strategies to ensure the physical, mental, and social well-being of their patients (Wong et al., 2018). This process involves comprehensive health assessments, which evaluate the patients' different aspects of health and identify areas that require treatment or attention. By focusing on functional recovery, healthcare providers aim to restore their patients' abilities to perform everyday activities and improve their overall quality of life. Patient satisfaction is not limited to just the delivery of physical care; it also addresses the disparities that exist in the healthcare system (Alam et al., 2018). These disparities can include unequal access to healthcare services, differences in treatment outcomes, or variations in the availability of resources among different groups of patients. By addressing and mitigating these disparities, healthcare providers can ensure that all patients receive equal and fair treatment, thus improving their satisfaction with the healthcare services provided. Another critical aspect of patient satisfaction is the effective use of healthcare services. This involves providing appropriate and necessary treatments, while also ensuring the continuity of care. Continuity of care refers to the smooth transition and coordination of healthcare services across different providers and settings. It ensures that patients receive consistent and uninterrupted care, which is crucial for achieving the best possible outcomes (Dulon et al., 2020). By optimizing the use of healthcare services, providers can not only enhance patient satisfaction but also maximize the efficacy of their interventions. Effective communication between healthcare providers and patients is also paramount to patient satisfaction. Clear and concise communication facilitates the understanding of medical conditions, treatment plans, and expected outcomes. It enables patients to actively participate in their healthcare decisions, fostering a sense of empowerment and involvement. By using better methods to communicate with their providers, patients can voice their concerns, ask questions, and actively engage in their own care, ultimately leading to greater satisfaction with the healthcare experience. While patient satisfaction and quality of care are intrinsically linked, it is equally important to focus on preventing potential injuries. Adverse events, such as needle stick injuries, can have severe consequences for both healthcare providers and patients. Needle stick injuries, which often occur during surgical and invasive procedures, can result in the accidental exposure of the provider's blood and body fluids to the patient's, potentially leading to the transmission of bloodborne pathogens (Gole et al., 2018). To mitigate the risk of such injuries, healthcare providers must possess a comprehensive understanding of needle stick injuries, their prevention, and the correct procedures to follow in the event of an injury. In nursing care, staff nurses in local hospital units face the unique challenge of providing care to patients with various medical diagnoses, some of which may be new and unfamiliar. These patients often require invasive procedures, which carry a inherent risk of needle stick injury. To effectively eliminate or prevent needle stick injuries, it is crucial to assess nurses' knowledge of these injuries and their related practices (Ahmed et al., 2022). This assessment can aid in developing targeted interventions to enhance nurses' understanding of prevention and appropriate actions in the case of an injury. Armed with a deep understanding of the nature and experiences of these injuries, researchers can design feasible and effective strategies to decrease the risk

of needle stick injuries and safeguard nurses from exposure while they provide essential care to their patients (Li et al., 2022).

To evaluate the knowledge and practice regarding needle stick injuries on 91 nurses of District Head Quarter Hospital And Shahida Islam Teaching Hospital Lodhran to investigate in relation to frequency and causes of needle stick injuries, diseases and health outcomes resulted from needle stick injuries, prevention of needle stick injuries, managing patients after needle stick injuries and knowledge and awareness of District Head Quarter Hospital And Shahida Islam Teaching Hospital Lodhran policy on needle stick injuries. The study helps us to identify cause and determine the risk factors for needlestick injuries, identify patient care activities during which most needle stick injuries occur, determine category of devices and the units in which they are being used, ascertain the types of needles involved in the incidents and evaluate the effectiveness of various safety-engineered devices. The study also outlines the prevalence rate of needle stick injuries that had the cause exposure to bloodborne pathogens, infectious complications incurred by needle stick injuries, prevalence rate of hepatitis B and C in health personnel, management and immediate actions taken by injured nurses after injury and duration of temporary and permanent work restriction in infected nurses.

Literature Review

Needle stick injuries (NSIs) pose a significant occupational health hazard for nurses worldwide. These unintentional punctures by contaminated needles and sharps can expose healthcare workers to bloodborne pathogens, including Hepatitis B (HBV), Hepatitis C (HCV), and Human Immunodeficiency Virus (HIV) (Iskandar et al., 2020). The potential consequences of NSIs are severe, ranging from emotional distress and anxiety to chronic illness and even death (Wong et al., 2018). Nurses represent the largest segment of the healthcare workforce and are at a particularly high risk of NSIs due to the nature of their work, which often involves frequent use of needles and sharps during patient care procedures (Alam et al., 2018). Understanding nurses' knowledge and practice regarding NSIs is crucial for developing effective strategies to prevent these injuries and mitigate their impact on both healthcare workers and patients. By identifying existing gaps in knowledge and areas for improvement in practice, healthcare organizations can implement targeted interventions to enhance NSI prevention efforts and ensure the safety of their staff.Research has indicated varying levels of NSI incidence among different healthcare professionals, with dental students and dentists also being at risk (Ikram et al., 2015). Training modules have been implemented to enhance the competence of nursing students in handling NSIs, resulting in improved knowledge and practice in this area (El-Hay & Allah, 2020). Furthermore, studies have highlighted the emotional burden and follow-up challenges faced by clinical nurses who experience insulin injection-related NSIs, emphasizing the need for effective prevention strategies (Li et al., 2022).

Assessments of nursing staff knowledge and practices regarding NSIs have been conducted in various healthcare settings globally, revealing disparities in awareness and adherence to safety protocols (Zarnigar et al., 2021; ElSawy & Mosa, 2020). Factors such as gender have been explored in relation to the prevalence, knowledge, attitude, and practice of healthcare workers concerning NSIs, indicating potential areas for targeted interventions (Rehman et al., 2022). Additionally, studies have identified the influence of staffing levels and resource adequacy on NSI rates among clinical nurses (Moon et al., 2019).

The adherence to safe injection practices and infection control guidelines plays a vital role in preventing NSIs among nurses (Setiaman et al., 2019; Solanky et al., 2016). However, challenges such as economic shortages and high rates of NSIs in specific hospital units have been identified, underscoring the importance of tailored interventions and continuous training programs (Dorgham & Obied, 2016). Understanding the prevalence and determinants of NSIs among nurses is essential for developing effective prevention strategies and ensuring a safe working environment (Ahmed et al., 2022).

Nurses constitute the largest segment of the healthcare workforce and are therefore disproportionately affected by NSIs (Alam et al., 2018). The nature of their work, which often involves frequent use of needles and sharps during procedures such as venipuncture, intravenous cannulation, and administration of injections, places them at high risk of exposure to bloodborne pathogens (Mohamud et al., 2023). Furthermore, factors such as time pressure, inadequate training, fatigue, and understaffing contribute to the occurrence of NSIs among nurses (Zaidi et al., 2021). Despite the availability of effective prevention strategies, including safe sharps devices and proper disposal techniques, NSIs remain a prevalent issue. Studies report that nurses have the highest risk of NSIs among healthcare professionals, with estimates suggesting a yearly incidence ranging from 3% to 8% (Mcgettigan et al., 2019). This highlights the critical need to understand nurses' knowledge and practice regarding NSIs. Research paints a complex picture regarding nurses' knowledge about NSIs. Some studies indicate a good understanding of the risks associated with NSIs and the importance of preventive measures (Al-Qahtani et al., 2021). However, others reveal knowledge gaps, particularly concerning specific high-risk procedures or the latest safety technologies (Yildirim et al., 2017). Factors like educational background, experience level, and access to training programs appear to influence nurses' knowledge base (Gole et al., 2018). Nurses' attitudes towards NSIs generally reflect a positive outlook on safety practices. Studies show a high level of awareness and willingness to adopt preventive measures (Lasch et al., 2012). However, certain work environments can foster negative attitudes. Workload pressure, time constraints, and insufficient staffing can lead to compromising safety protocols (McNeill et al., 2017).Despite significant research efforts, controversies and knowledge gaps persist regarding NSIs. Some studies suggest a potential overestimation of the risk of transmission for certain bloodborne pathogens following NSIs (Iskandar et al., 2020). Additionally, the effectiveness of specific preventive interventions, such as post- exposure prophylaxis (PEP) protocols, can be debated (Wilburn et al., 2018).Despite the prevalence of NSIs, there is a consistent trend of underreporting. Studies have reported underreporting rates ranging from **13.1% to 62.1%.** Reasons for underreporting include fear of consequences, lack of awareness, and administrative barriers. (Al Qadire, M., Ballad,) Proper disposal of sharps (including needles) is critical to preventing NSIs. Nurses' concerns about the availability and accessibility of sharps disposal containers remain a point of contention.(American Nurses Association. (n.d.). Sharps Injury Prevention[2] Access the ANA Enterprise resource) Furthermore, research often fails to capture the nuanced realities faced by nurses in diverse healthcare settings. Studies frequently focus on hospital environments, neglecting the unique challenges encountered by nurses in community settings or long-term care facilities (Mcgettigan et al., 2019). One of the key controversies surrounding nurses' knowledge and practice regarding NSIs pertains to the effectiveness of safety devices and engineering controls in preventing these injuries. While the implementation of safety-engineered devices (SEDs) such as retractable needles and needleless IV systems has been mandated in many healthcare facilities, their impact on reducing NSI rates remains a subject of debate (Mohamud et al., 2023). Some studies have reported a significant reduction in NSIs following the introduction of SEDs, while others have found no significant difference compared to conventional devices (Zaidi et al., 2021). Additionally, concerns have been raised regarding the proper use and maintenance of SEDs, as well as their potential to increase healthcare costs. Understanding these controversies and knowledge gaps is crucial for developing targeted interventions. Research efforts need to explore the specific factors contributing to lapses in safe practice and identify effective strategies to promote adherence to safety protocols across various healthcare settings.

Results

4.1 Demographics:

The sample of 91 nurses include 2 males (2.2%) and 89 females (97.8%). There were 49 (53.8%) nurses

working for public or government and 42 (46.2%) nurses working privately. There were 18 (19.8%) nurses who have less than 1 year experience and 73 (80.2%) nurses who have more than 1 year experience.

Table 4.1: Demographic data of Nurses (n=91)

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	2	2.2	2.2	2.2
	Female	89	97.8	97.8	100.0
	Total	91	100.0	100.0	

Workplace					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Public	49	53.8	53.8	53.8
	Private	42	46.2	46.2	100.0
	Total	91	100.0	100.0	

Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 1 year	18	19.8	19.8	19.8
	more than 1year	73	80.2	80.2	100.0
	Total	91	100.0	100.0	

4.2 **Nurses' Knowledge Regarding Needle Stick Injuries**

Knowledge regarding needle stick Injuries (NSIs) by 60 (65.93%) nurses was good, followed by no knowledge by 7 (7.70%) and poor knowledge by 24 (26.37%) nurses.

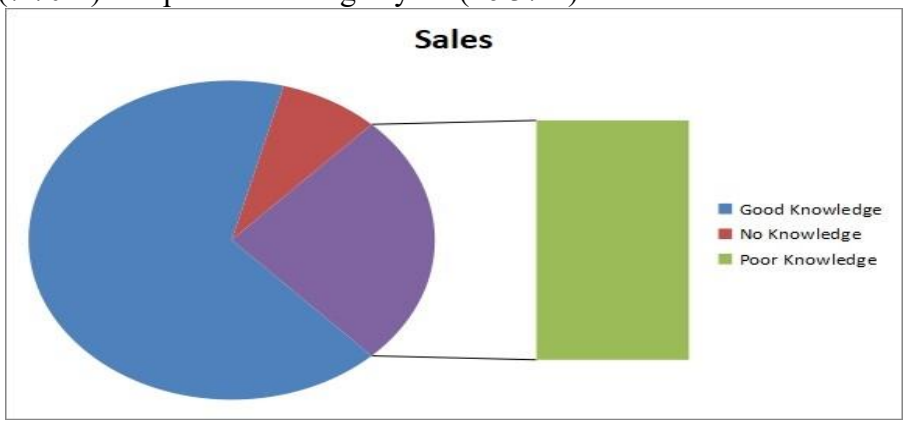

Table 4.2: Nurses' Knowledge Regarding Needle Stick Injuries of District Head Quarter hospital and Shahida Islam Teaching Hospital Lodhran (n=91)

Knowledge of NSIs	Sample statistics	
	Frequency (f)	Percentage

		(%)
Good Knowledge	60	65.93
No Knowledge	7	7.70
Poor Knowledge	24	26.37
Total	91	100%

Nurses' Practice Regarding Needle Stick Injuries

Practices concerning Needle Stick Injuries (NSIs) by 68 (74.73%) agreed, followed by uncertain by 9 (9.89%) and disagreed by 14 (15.38%) nurses.

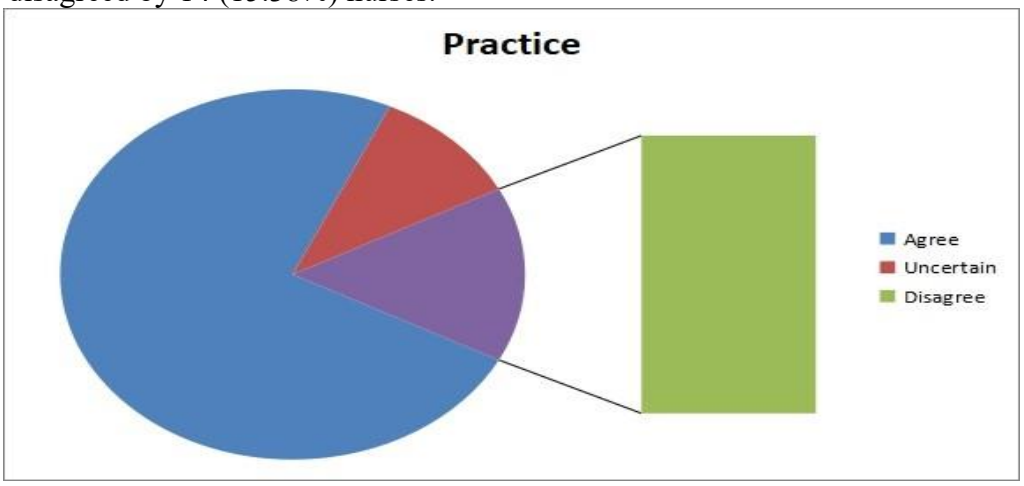

Table 4.2: Nurses' Practice Regarding Needle Stick Injuries of District Head Quarter hospital and Shahida Islam Teaching Hospital Lodhran (n=91)

Practice of NSIs	Sample statistics	
	Frequency (f)	Percentage (%)
Agree	68	74.73
Uncertain	9	9.89
Disagree	14	15.38
Total	91	100%

Discussion

Despite the suboptimal knowledge, the study found that a significant proportion of nurses reported adherence to standard precautions and proper disposal practices. However, a concerning finding was the underreporting of NSIs incidents. This reluctance to report NSIs could stem from various factors, including fear of stigma, concerns about job security, lack of awareness about reporting mechanisms, and perceived administrative barriers (Solanky et al. 2016). Moreover, the study highlighted inconsistencies in the use of personal protective equipment (PPE) among nurses, indicating a need for reinforcement of

infection control practices. Factors influencing PPE compliance could include discomfort, perceived inconvenience, lack of availability, and inadequate training on proper usage (ElSawy et al. 2020).

In our study, knowledge regarding needle stick Injuries (NSIs) by 60 (65.93%) nurses was good, followed by no knowledge by 7 (7.70%) and poor knowledge by 24 (26.37%) nurses. Practices concerning Needle Stick Injuries (NSIs) by 68 (74.73%) agreed, followed by uncertain by 9 (9.89%) and disagreed by 14 (15.38%) nurses.

A study founded Mohamud, et al. where the study was conducted on 233 needlestick and sharps injury cases were reported in all. In the course of the six-year period, nurses (52.4%) reported the most needlestick and sharps injury incidents, followed by cleaners (22.3%), doctors (18.5%), and technicians (6.9%). After inpatient care (17.6%) and emergency rooms (16.7%), operation theaters were the most common location (21.9%) where injuries occurred. An device that caused injuries the most often reported was a hypodermic needle (81.1%). Hepatitis B was contaminating about 24.9% of the needles or sharps equipment that resulted in needlestick and sharps injury cases. Regarding needlestick and sharps injuries, gender and place of injury differed significantly (P=0.001).

A study reported by Dulon, et al. from a sample of 835 files in all was sampled. 35.0% of all NSIs were safety-engineered devices (SEDs) -injuries; the percentages were greater in medical offices and lower in care institutions. More frequently than NSIs in physicians, NSIs in nurses were linked to SEDs. Over 60% of instances in hospitals and medical offices and over 30% of cases in care facilities linked NSIs from intravenous needles to SEDs. Every fourth NSI in hospitals, however, was linked to suturing; less than 10% of these were linked to SEDs. Subcutaneous injections using SEDs accounted for 36.1% of NSIs in care homes. Of all NSIs, 29.2% occurred during disposal; of these, 36.1% were linked to SEDs (safety-engineered devices).

Comparable results were founded by Ahmed, et al. in which ninety-two percent of nurses were female, and eighty percent of them routinely looked after ten patients or fewer. A lifetime incidence of needle stick injury among nurses was found to be 37.6% (95% CI = 31.9% to 43.3%) in this study. Among the afflicted nurses, syringe needles were the most common item (78.3%), followed by intravenous catheters and tapping needles (11.3% and 7.5%, respectively).Features of nurses, like years of experience, degree of education, hours worked, and number of patients on duty, could not predict the incidence of needle stick injury. Significant predictors included, nevertheless, training on NSI prevention, status of Hepatitis B vaccination, and availability of safety boxes at work.

Similar resulted were reported by Li, et al. in 2022, on 5,389 nurses answered the poll; 396 (7.4%) of them had needle-stick injuries associated to insulin injections in the previous year, or 115.0 per 1000 nurses annually. Infection brought on by the injuries was 18.7 per 1000 nurses annually. The most injuries (42.4%) happened as nurses were recapping the needle. Most of the injuries (98.4%) were handled by the injured nurses acting appropriately right away. Only 30.3% of nurses did, however, report their injuries to the administrative staff, and in 43.2% of cases, the nurses declined or stopped the recommended follow-up. Most of the injured nurses (58.6%) went through emotional upheavals. Incidence of needle-stick injuries linked with insulin injections was found to be correlated with department, frequency of insulin pen and syringes, and removing and/or setting back needle caps with bare hands, according to multivariate logistic regression. We report this work in accordance with STROBE guidelines.

EI, et al. reported that out of the medical staff, 45% were women and 55% were men. 42.2% of the subjects were nurses. Sixty-five percent of the participants are aware about needles and sharp injuries. While 45% had needle and sharp injury experiences, just 18.3% had reported such incidents. Although 11% disagreed, 37.6% strongly agreed that wearing gloves while handling needles and sharp objects can lower the number of needle-related injuries. Comparably, 59.6% of respondents said they strongly agreed that having safety boxes at work can lower the number of needle and sharp injury cases. Rehman, et al. revealed that of the 88 participants questioned, nearly all said they knew about personal protection equipment and general safety measures. Just 44.3% of nurses listed every necessary precaution. Just 67.05% of nurses correctly described how needle stick injuries can be avoided, although 89.77% were aware of the health risks

associated with needle stick injuries. While working, 38.64% of nurses had needle sticks, and the majority of them (79.41%) had followed the right procedures.

Conclusion

In our study, knowledge regarding needle stick injuries of nurses was good, followed by poor knowledge and no knowledge. Practice concerning needle stick injuries of nurses was agree, followed by disagree and uncertain.

Limitations

Numerous potential limitations could have affected our study's findings. The study was conducted at two different hospitals, and the sample size was small. The statistical findings were not likely to be the result of chance, but this did not imply that they were legitimate or applicable to situations outside of these hospitals. A significant limitation is the underreporting of needle stick injuries among healthcare professionals, which can lead to an inaccurate estimation of the actual incidence rates. There is a lack of comprehensive awareness among healthcare workers about the risks associated with needle stick injuries, leading to potential gaps in preventive measures and reporting systems. Deficiency in training programs for healthcare workers regarding safe injection practices and proper handling of sharp devices, contributing to increased risk of needle sticks injuries. Inadequate availability of resources for the safe disposal of sharp objects and implementation of safety precautions, posing a challenge in preventing needle stick injuries effectively.

Recommendations:

- Improve reporting systems and enhance awareness among healthcare workers to encourage reporting of needle stick injuries
- Strengthen training programs to educate healthcare workers on safe injection practices, proper handling of sharp devices, and preventive measures against needle stick injuries
- Ensure adequate availability of resources, such as safety equipment and proper disposal facilities, to support the implementation of safety precautions
- Implement tailored interventions based on specific regional challenges, such as addressing cultural and socioeconomic factors, to effectively mitigate the risks of needle stick injuries in Pakistan
- Promote a culture of safety and accountability among healthcare workers to prioritize the prevention of needle stick injuries

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