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Sharp Injuries in a Tertiary Care Hospital: A Deep Dive into Interventions and Prevention Strategies

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Abstract

Needle-stick injuries are a major concern for healthcare workers, as they can lead to the spread of infectious diseases. This study aimed to identify factors contributing to NSIs and evaluate the effectiveness of prevention strategies in a tertiary care hospital. This observational study analysed NSI incidents among HCWs over a six-month period. Data was collected through, incident reports, and medical records. Over six months, 60 cases of NSI were reported. The most common departments affected were the emergency department (20%), surgical ward (15%), and intensive care unit (10%). The most frequent sharps involved were hypodermic needles (50%), followed by IV cannulas (25%). The primary contributing factors to NSIs were improper handling of sharps (40%), inadequate training on safety procedures (25%), and workload-related stress (15%). Despite existing safety measures, NSIs remain a prevalent issue in healthcare settings. Implementing comprehensive prevention strategies, including enhanced training, improved safety devices, and effective incident reporting systems, is crucial to reduce the incidence of NSIs and protect HCWs from bloodborne pathogen exposure.

Keywords: Needle stick injuries, sharp injuries, Healthcare workers

1. Introduction

Accidental exposure from blood/body fluid of patients is a risk to healthcare workers (HCWs). Percutaneous injury is the most common method of exposure to blood borne pathogens derived from contaminated needles or sharp devices leading to infectious diseases, especially hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). The Centre for Disease Control (CDC) estimates that about 600,000 to one million needle stick injuries occur each year. WHO reports in the World Health Report 2002, that of the 35 million healthcare workers, 2 million experience percutaneous exposure to infectious diseases each year. It further notes that 37.6% of Hepatitis B, 39% of Hepatitis C, and 4.4% of HIV/AIDS in Health-Care Workers around the world are due to needle stick injuries. The high rate of needle-stick injuries (NSIs) among healthcare workers (HCWs) highlights the need to enhance occupational health services and strengthen needle-stick prevention education programs worldwide. This article delves into examining the needle stick/sharps injury leading to transmit various blood borne pathogens, psychological trauma, Healthcare associated infections (HAIs) among

the healthcare workforces in a specific setting
Percutaneous injuries, caused by needle sticks and other sharps, are a serious concern for all healthcare workers (HCWs) and pose a significant risk of occupational transmission of bloodborne pathogens. Safety features such as shields and retractable needles may be valuable in preventing these injuries, and their efficacy should be thoroughly evaluated [1] Needle stick injuries are wounds caused by needles that accidentally puncture the skin. These injuries can occur at any time when people use, disassemble, or dispose of needles. Sharps include needles, as well as items such as scalpels, lancets, razor blades, hypodermic needles, scissors, metal wire, retractors, clamps, pins, staples, cutters, and glass items. Accidental exposures to blood of body fluids (ABE) expose health care workers (HCW) to the risk of occupational infection. Examine. NSIs need to be examined, and information must be provided regarding the safety precautions [2] In healthcare environments, hypodermic needles are among the most frequently used sharp instruments. Failure to follow proper guidelines for hypodermic needle use contributed to the occurrence of needle-stick injuries Improper handling of hypodermic needles significantly raises the risk of needle-stick injuries Essentially, any object that can cut the skin can be considered a sharp. NSIs come with substantial direct, indirect, potential, and intangible costs that could rise over time. Investing in preventing occupational exposures and infections, including providing safer equipment, might be offset by the savings from fewer NSIs[3]This study is done to determine the occurrence of needle stick/sharp injuries (NSI) among various categories of healthcare workers (HCWs), and the causal factors leading to such injuries that have happened during the past 6 months in a tertiary care hospital. This study where the data has been analysed for the past 6 months and critical incident reporting system has been observed in the hospital and accordingly the interventions and strategies are suggested to motivate the HCWs on importance of incident reporting and prevention for future occurrence of the NSIs

2. Literature Review

Needle-stick injuries (NSIs) are a worldwide occupational health problem in the healthcare industry Healthcare workers (HCWs) suffer more than 2 million occupational needle-stick injuries (NSIs) annually. These measures include immunization against HBV, eliminating unnecessary injections, implementing Universal Precautions, Use of safety devices is a key starting point for preventing needle stick injuries, and healthcare workers generally accept them well eliminating needle recapping, using safer needle devices, providing personal protective equipment (PPE), and training HCWs on prevention strategies Despite advancements in safety measures, NSIs remain a prevalent issue in healthcare settings, particularly tertiary care hospitals. Instead of focusing on the total number of contaminated sharps injuries nationwide, the emphasis should be on understanding how to prevent future occurrences.

This literature review explores the current state of research on NSIs, focusing on factors contributing to their occurrence, effective prevention strategies, and the role of critical incident reporting systems. Medical waste, including contaminated needles and radioactive isotopes, is more likely to cause infections and injuries than other types of waste. Inadequate handling of this waste can lead to serious public health problems and environmental damage. To prevent healthcare-associated infections (HCAIs), it's crucial to follow evidence-based practices and procedures that stop infections. Current guidelines emphasize evidence and mandatory requirements for reducing needle stick injuries (NSIs). These systems are intended to enhance patient care by detecting and analysing adverse events and implementing measures to prevent them from recurring. Several studies have identified many of these injuries are occurring prior to activation of a safety feature, therefore it is critical to remain diligent about employing safe work practices and the environment where and when using the devices factors contributing to NSIs in healthcare settings.

To ensure employee safety from bloodborne pathogens, employers must implement a plan outlining specific measures to protect workers from exposure For example, a study found that unsafe practices, such as recapping needles and If healthcare workers (HCWs) are accidentally pricked by contaminated needles or other sharp objects, they are at risk of being exposed to harmful, infectious substances and improper handling of sharps, were common risk behaviours, another study highlighted the role of workload and stress due to injuries increasing the likelihood of accidents. These injuries not only pose health risks but also cause psychological distress, fear, tension, and anxiety among healthcare workers, leading to increased absences from work and negatively impacting

healthcare services. Each NSI case imposes a direct and indirect cost of 175 to 350 USD to the health care system. To improve safety, we need more resources for proper use of safety devices, effective training, and in-depth investigations of all needle stick injuries [4]

Additionally, another article emphasized the importance of adequate training and education in preventing NSIs. Collectively, these studies underscore the multifaceted nature of the factors leading to NSIs faced HCWs and the need for a strategic approach to overcome them also Healthcare institutions need to regularly train healthcare professionals, especially nurses and cleaners, about the significance of needle stick and sharps injuries. To prevent these occurrences, we need clear guidelines, sufficient staff, proper training, and a focus on safety awareness [5] The study showed that needle stick injuries are a significant problem among healthcare workers and emphasized the importance of improving occupational health and safety globally. Implementing standard precautions, providing regular training, and monitoring guideline adherence are key to reducing needle stick injuries and preventing infectious diseases as reported by Santos at el.[6] .Using safety devices alongside trainings can substantially decrease the risk of accidental needle punctures Although most sharps injuries occur among nursing staff, other healthcare workers like lab technicians, doctors, housekeepers, and more can also be at risk and need protection . To reduce needle stick injuries, we should prioritize strategies, implement organizational changes like education and monitoring, redesign tools, and encourage safe needle handling practices to assess the risk of study [7,8] Also one year prevalence wise different set of Category is seen commonly by job category identified as surgeons, at 72.6% (95% CI: 58.0-87.2). The estimates for medical doctors (excluding surgeons), nurses (including midwives) and laboratory staff (including laboratory technicians) were 44.5% (95% CI: 37.5-51.5), 40.9% (95% CI: 35.2-46.7) and 32.4% (95% CI: 20.9-49.3), respectively. PCIs commonly occurred among HCWs working in hospital (41.8%, 95% CI: 37.6-46.0) than non-hospital (7.5%, 95% CI: 5.9-9.1) settings as reported by Auta A, et al. [9]. Also, few risk factors associated with NSI have been identified. Factors such as female gender, younger age, work experience, job stress, work shift, education, and hospital ward were found to have a significant influence on the incidence of NSI[10],One study shows emotional distress and underreporting estimates for significant NSIs among Nurses with needle that draws the blood while injecting Insulin[11]the blood Safe work practices, proper disposal methods, educational initiatives, and infection control precautions should be implemented to minimize needle stick injuries (NSIs) and their contributing factors. Economic efforts directed at preventing occupational exposures and infections, including provision of safety-engineered devices, may be offset by the savings from a lower incidence of NSIs [12] These sharps injuries remain a frequent threat amongst HCWs [13] Healthcare workers who experience needle stick injuries face significant clinical, economic, and emotional challenges. Safer injection devices can help reduce the risk of these injuries and the associated costs, stress, and risk of blood-borne infections [14] According to the World Health Organization, more than two million occupational exposures to sharp injuries occur among 35 million healthcare providers (HPs) annually [15] Nurses are more likely to experience needle stick injuries than doctors. Surgeons are most often injured while using scalpels and needles during surgery. Using safe equipment significantly reduces injuries, especially for nurses. In non-surgical wards, injuries are much less frequent after implementing safe equipment, although reporting varies. Keeping records of employee injuries and analysing them can help identify ways to improve workplace safety [16] Strategies need to be established to improve the working conditions and reduce the stress level of HCW[17]

Research Methodology

This was an observational study conducted in a tertiary care hospital. Data was collected over a six-month period to analyse the occurrence of needle stick/sharp injuries (NSIs) among various categories of healthcare workers (HCWs) and critical incident reporting system was also monitored for timely intervention of the NSIs in the hospital**.**

Prevention strategies such as safety devices, training programs and incident reporting systems need to be rigorously evaluated to assess their effectiveness in reducing NSI rates and improving adherence. While previous studies have identified common risk behaviours and factors relating to NSIs, there is a need for in-depth analysis to understand the underlying root causes, such as organizational culture, workload, and staffing levels. The long-term consequences of NSIs, including the psychological impact on healthcare workers and the potential for

healthcare-associated infections, need to be further studied to inform prevention efforts. Training on workplace safety and well-being, clear safety instructions, and avoiding recapping needles can help prevent needle stick injuries among healthcare workers[18,19] Needle sticks and sharp injuries and explore potential root causes and to evaluate the implementation and adherence to existing sharp injury prevention strategies within the hospital.

Study Setting: Multi-speciality hospital in Mumbai
Data Collection Method: This study was carried out in a tertiary care hospital in Mumbai. The data was analysed for the past 6 months from January to June. The NSI in the study included injuries caused by sharps such as hypodermic needles, blood collection needles, IV cannulas, suture needles, winged needle IV sets, and needles used to connect parts of the IV delivery systems. The data comprised the source of needle stick injury, history, source status, departments, various staff categories that have sustained injury along with immunization status and preventive measures which were taken by the hospital
Incident Reports: Data was extracted from the hospital's critical incident reporting system, focusing on incidents involving NSIs over past six months
Medical Records: Patient medical records were reviewed to identify cases where NSIs occurred.
Data Analysis: Data was analysed by using Percentage analysis on Excel. Tables, Bar graphs, Line graphs, and Pie charts
Observations: During the past 6 months, 60 cases of needle/sharp injury were reported in the hospital

Table 1 showing the distribution of No. of Injuries ward wise

Wards	No of Injury in wards
10A	5
10B	8
9A	3
Cardiology	2
Casualty	5
ICCU	3
ICU	2
MOT	4
OPD	3
OT 1	10
SICU	7
OT 2	5
NICU	3
Grand Total	60

Source: Original

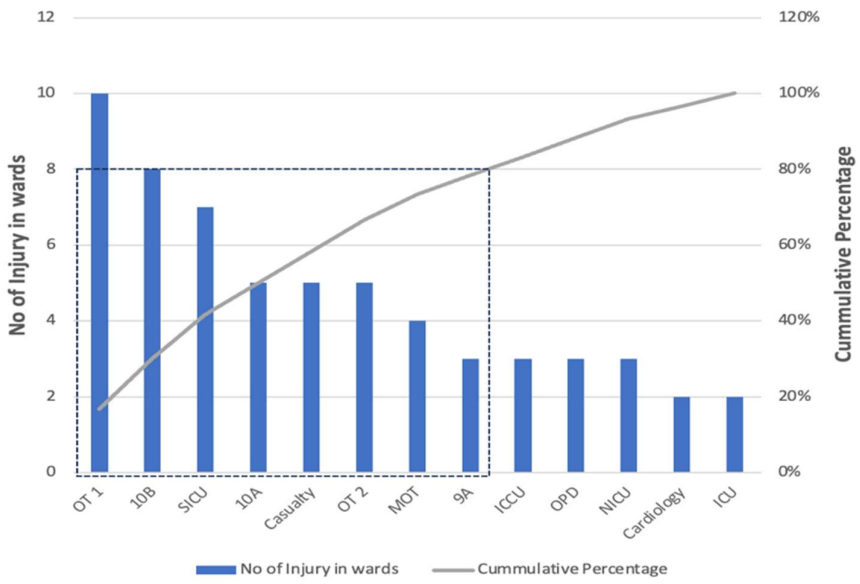

Fig. 1: Pareto Chart - No. of Injuries ward wise

From the above Pareto chart (fig 1) a visual representation of the number of injuries in various wards within a healthcare facility and the cumulative percentage of these injuries.

OT 1 is the ward with the highest number of injuries, accounting for 10 out of 39 total injuries. The first eight wards (OT 1, 10B, SICU, 10A, Casualty, OT 2, MOT, and 9A) together account for 80% of all injuries. This indicates that a significant portion of injuries occur in a relatively small number of wards. The remaining wards (ICCU, OPD, NICU, Cardiology, and ICU) contribute to the remaining 20% of injuries. The cumulative percentage curve shows the cumulative proportion of injuries as we move from left to right across the wards. It demonstrates that the majority of injuries occur in the initial wards.

Table 2 showing Category of HCWs having NSIs

Category	Number of Injuries
Doctor	18
Nurses	24
Patient Relative	9
Pharmacist	9
Grand Total	60

Source: Original

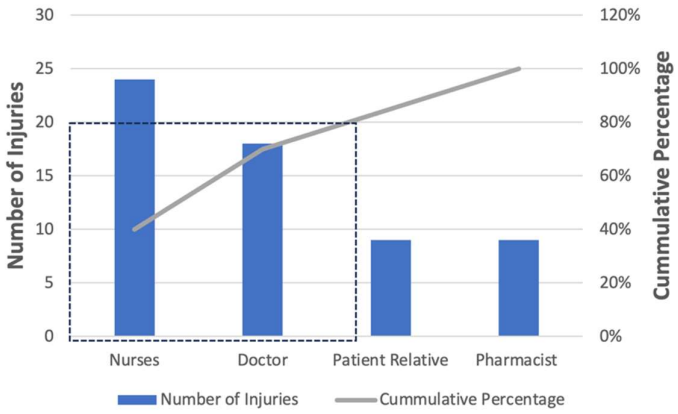

Fig. 2: Pareto Chart - Category of HCWs having NSIs

The Pareto chart provides a visual representation of the number of injuries among different healthcare personnel and the cumulative percentage of these injuries. Nurses have the highest number of injuries, accounting for 24 out of 40 total injuries. The first two categories (Nurses and Doctors) together account for 85% of all injuries. This indicates that a significant portion of injuries occur among these two groups. The remaining categories (Patient Relatives and Pharmacists) contribute to the remaining 15% of injuries. The cumulative percentage curve shows the cumulative proportion of injuries as we move from left to right across the categories. It demonstrates that the majority of injuries occur among Nurses and Doctors.

Table 3 showing up Department wise number of injuries

Department	No of Injuries
Cardiology	2
Casualty	5
Dental	2
ENT	4
General Surgery	2
Gynaecology	5
ICCU	3
ICU	2
Main OT	10
Neurosurgery	5
NICU	3
Nursing	1
Obstetric	2
Orthopaedic	2
Paediatrics	4
Pharmacy	1
SICU	7
Grand Total	60

Source: Original

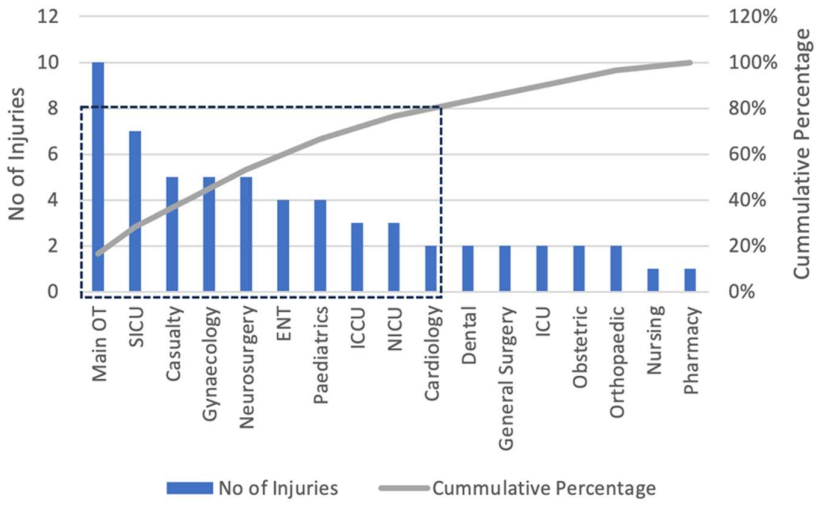

Fig. 3: Pareto Chart - Department wise number of injuries

The Pareto chart provides a visual representation of the number of injuries in various departments within a healthcare facility and the cumulative percentage of these injuries. Main OT is the department with the highest number of injuries, accounting for 10 out of 39 total injuries. The first eight departments (Main OT, SICU, Casualty, Gynaecology, Neurosurgery, ENT, Paediatrics, and ICCU) together account for 80% of all injuries. This indicates that a significant portion of injuries occur in a relatively small number of departments. The remaining departments (NICU, Cardiology, Dental, General Surgery, ICU, Obstetrics, Orthopaedic, Nursing, and Pharmacy) contribute to the remaining 20% of injuries. The cumulative percentage curve shows the cumulative proportion of injuries as we move from left to right across the departments. It demonstrates that the majority of injuries occur in the initial departments.

Table 4 showing up the source and status of NSI

Source and Source Status	HbsAg positive	HCV positive	HIV positive	Negative	Unknown	Grand Total
Femoral Artery Puncture needle				2		2
Fish Hook	5					5
Glucometer Lancet					3	3
Insulin Syringe Needle				4		4
IV Stylet Injury				6		6
Hypodermic Needle			1	5	1	7
Scalp Blade					1	1
Scalpel Blade				10		10
Splash	2	1				3
Surgical Blade				1		1
Suturing Needle				10		10
Towel clip				4		4
Tuberculin Syringe				2		2
Vein flow no. 22				2		60
Grand Total	7	1	1	46	5	60

Source: Original

Table 5 showing up History for NSI

History of NSI	Number of Injury
Accidental Injury	5
Accidental Injury during blood collection	5
Accidental Injury during Ceasarian section	1
Accidental Injury during demonstration	4
Accidental Injury during femoral artery puncture	2
Accidental injury during surgery	2
Accidental Injury during Suturing	2
Accidental Injury while closing skin during TKR	1
Accidental Injury while handing over instrument during surgery	2
Accidental Injury while handling tissue for biopsy	1
Accidental Injury while removing dressing	2
Accidental Injury with scalpel blade	2
Accidental prick by needle found stuck in the pillow	1
Accidental Splash while checking for back flow of arterial line	1
Accidental splash while insertion of foleys catheter	1
Accudental Injury While doing blood collection	1
During aspiration while flushing fluid	7
During Canulation	4
During inserting veinflow	4
Giving incision with scalpel blade no 15	4
Giving injection	2
Used Insulin Syringe	1
While collecting rappers used needle lying on injection trolley	2
While discarding needle	2
While recapping the used syringe	1
Grand Total	60

Source: Original

3. Results

During the past 6 months, 60 cases of needle/sharp injury were reported in the hospital. The provided data in table 1 reveals the distribution of needle stick/sharp injuries (NSIs) across various wards in a tertiary care hospital. The highest number of injuries occurred in the OT (Operating Theatre) with 10 cases, followed by MOT (Medical Observation Treatment) with 4 cases. Other wards with multiple incidents include 10B with 8 cases and Casualty with 5 cases. While most wards reported fewer than 5 NSIs, these data indicate a need for further investigation and targeted interventions to address the higher incidence in certain areas. The specific reasons for the increased occurrence in these wards may be attributed to factors such as higher patient volume, complex procedures, or inadequate safety practices Table 2 data reveals Category of HCWs having NSIs. Doctors and nurses accounted for most injuries, with 18 and 24 cases, respectively. Patients' relatives and pharmacists experienced fewer incidents than Doctors and Nurses with 9 case each. Overall, the data indicates a significant number of NSIs within the hospital, highlighting the need for improved safety measures and training to prevent these injuries. Also, one study shows how different factors like Recapping of needles waste disposal boxes contained recapped needles and sharps were observed around the facility, in unsupervised disposal containers were seen and in unsafe storage of full boxes was observed as reported by Al Awaidy et al. [20]. While disposal of the used waste was done away from the health facility, only 33.3% disposed of it by correct incineration. The high incidence among doctors and nurses suggests that these professionals may be particularly at risk due to their frequent exposure to sharp objects

and patients. Table 3 showing up unit wise number of injuries where OT (Operating Theatre) having highest number of NSIs followed by other departments. Table 4 showing up the source and status of NSI. Table 5 showing up history for NSI accidental injury during blood collection, giving incision with scalpel blade no 15, suturing, canulation etc the most common type of sharp object involved in NSIs was the needle, accounting for 60 of the 60 total incidents. This underscores the importance of implementing safety measures specifically designed to prevent needle-stick injuries. Furthermore, the data reveals that a significant number of injuries occurred during common healthcare procedures such as surgery, blood collection, and suturing. This indicates a need for improved safety practices and training during these procedures to reduce the risk of NSIs. Continuing education and training programs are recommended for primary healthcare physicians and nurses to stay informed about new safe injection policies, practices, and procedures. These programs should be designed based on research that assesses healthcare workers' actual and perceived needs in relevant areas [21] as Health care workers are at risk of bloodborne diseases and the psychological consequences of these injuries [22].

The Pareto chart (Fig 1) suggests that focusing on improving safety measures in the top eight wards could significantly reduce the overall number of injuries in the healthcare facility. This could involve implementing targeted interventions such as staff training, process improvements, or equipment upgrades.

Nurses and Doctors could significantly reduce the overall number of injuries in the healthcare facility. This could involve implementing targeted interventions such as staff training, process improvements, or equipment upgrades (Fig 2).

The Pareto chart (Fig 3) suggests that focusing on improving safety measures in the top eight departments could significantly reduce the overall number of injuries in the healthcare facility. This could involve implementing targeted interventions such as staff training, process improvements, or equipment upgrades.

4. Discussion

The findings of this study are consistent with other research that has shown that doctors and nurses are at the highest risk of NSI. This is likely due to their frequent contact with sharps and needles. The study also found that the most common sources of NSI were suture needles, IV cannulas, and hypodermic needles. This is consistent with other studies that have shown that these devices are the most common sources of NSI.

This is a positive finding, as it suggests that the hospital's immunization program is effective. Regular educational classes and induction sessions for the recruits bring out a positive change in knowledge, practice, and attitude toward safety protocols [23,24,25] However, the study also found that a small number of HCWs had not received complete immunization.

The study also found that the majority of NSI occurred in the operating room (OR) and the emergency department (ED). This is consistent with other studies that have shown that these areas are high-risk areas for NSI. This is likely because these areas are where the most invasive procedures are performed and where there is a high volume of patients

Due to the high prevalence of needle-stick injuries (NSIs), it is crucial to provide safe needles and instruments, conduct training programs on new methods for the safe use of sharp objects, adhere to safety principles and standards, enhance the practical skills of healthcare personnel, and emphasize the importance of reporting incidents and improving occupational practices, such as avoiding needle recapping. These measures can help reduce the occurrence of NSIs and the associated risk of bloodborne pathogen (BBP) transmission

5. Interventions and Preventive Strategies for Needle Stick Injuries:

1.**Elimination of Hazards**: The most effective method for reducing the risk of sharp-related injuries is to eliminate the use of sharps wherever possible. This can be achieved by substituting injections with alternative routes of medication administration, such as oral tablets, inhalers, or transdermal patches. Additionally, the use of jet injectors as substitutes for traditional syringes and needles, along with the removal of unnecessary sharps like towel clips, are effective means of eliminating the source of hazard. The adoption of needleless intravenous (IV) systems also contributes to the elimination of unnecessary sharp instruments in healthcare settings.

2.**Engineering Controls**: Engineering controls refer to the implementation of devices designed to reduce the risk of exposure to sharps. Examples include needles that retract, sheathe, or blunt immediately after use. These technologies are critical in mitigating the risk of needle-stick injuries by automatically neutralizing the sharp point

after use.

3.**Administrative Controls:** Administrative controls involve the development and enforcement of policies aimed at minimizing exposure to sharps hazards. These include establishing a needle-stick prevention committee, developing an exposure control plan, and ensuring the allocation of resources that demonstrate a commitment to healthcare worker safety. Additionally, the removal of unsafe devices and the consistent provision of training on the use of safe devices are essential components of administrative controls.

4.**Work Practice Controls:** Work practice controls focus on modifying the way tasks are performed to reduce the risk of injury. Examples include avoiding the recapping of needles, placing sharps containers at eye level and within arm's reach, and ensuring that disposal container placements account for the needs of healthcare workers, particularly female nurses. Other best practices include emptying sharps containers before they become overfilled and establishing safe handling and disposal procedures for sharps prior to the commencement of medical procedures.

5.**Personal Protective Equipment (PPE):** PPE serves as a barrier between healthcare workers and potential hazards. Standard PPE includes eye goggles, face shields, gloves, masks, and gowns, all of which protect against exposure to infectious materials and reduce the likelihood of injury from sharps.

6.**Elimination of Unnecessary Sharps:** Removing sharps that do not serve a critical function, such as certain types of surgical clips or outdated devices, can significantly reduce the risk of injury. This strategy should be part of an overarching effort to streamline the use of medical instruments and focus on safer alternatives.

7.**Provision of Medical Devices:** Providing healthcare workers with access to advanced medical devices designed with safety mechanisms helps minimize the risk of sharp-related injuries. This includes ensuring that all staff members have access to the latest safety-engineered devices.

8.**Incorporation of Safety-Engineered Protection Mechanisms:** Incorporating safety-engineered mechanisms into medical devices, such as needles with built-in shields or retracting features, is a critical component in reducing exposure to sharps injuries.

9**. Implementation of Safe Systems of Work:** Establishing comprehensive systems of work that prioritize the safe use, handling, and disposal of sharps is essential. This includes developing protocols that healthcare workers can follow to reduce the risk of injury during their daily tasks.

10**.Safe Procedures for Using and Disposing of Medical Sharps:** Implementing standardized procedures for the safe use and disposal of medical sharps is crucial in preventing injuries. This includes clear guidelines on how sharps should be handled, disposed of, and managed throughout the healthcare facility.

11.**Banning Recapping:** Recapping needles is a significant source of injury, and healthcare facilities should enforce strict policies prohibiting this practice. Eliminating recapping helps reduce the risk of accidental puncture injuries.

12.**Use of Personal Protective Equipment (PPE):** Healthcare workers should be provided with, and required to use, appropriate PPE whenever they are at risk of exposure to sharps. Ensuring that PPE is properly fitted and available is crucial for maintaining a safe working environment.

13.**Vaccination:** Vaccination of healthcare workers against diseases that can be transmitted via needle-stick injuries, such as hepatitis B, is a key preventive measure in reducing the risk of infection following exposure to sharps.

14.**Information and Training:** Providing ongoing information and training to healthcare workers is essential for maintaining awareness of the risks associated with sharps and ensuring that all staff members are equipped with the knowledge to handle and dispose of sharps safely. Regular training sessions should cover new devices, procedures, and updates to safety protocols.

6. Recommendations:

1.**Periodic Training of Healthcare Workers**

Regular training sessions should be instituted to educate healthcare workers on proper work procedures aimed at minimizing mistakes that could lead to avoidable incidents. These sessions should focus on evidence-based practices, emphasizing the importance of adherence to established protocols. Continuous education not only enhances skill retention but also fosters a culture of safety within healthcare settings.

2.**Safe Management of Sharp Waste**

he management of sharp waste is paramount in preventing needle-stick injuries (NSIs) and subsequent transmission of infections. Healthcare facilities must implement protocols for the immediate disposal of contaminated sharp materials post-use. This includes the prohibition of needle recapping and the requirement for puncture-proof containers that are designed to contain sharp objects and prevent leakage of fluids. Proper training on the handling and disposal of sharp instruments should be integrated into regular staff education.

3.**Training on Safe Practices to Combat Transmission**

Healthcare workers must be trained comprehensively on safe practices that help combat the transmission of infections. This includes the correct use of personal protective equipment (PPE), hand hygiene practices, and adherence to isolation protocols. Regular refresher courses should be provided to ensure that staff remain informed about the latest guidelines and recommendations.

4.**Annual "Infection Prevention Week**"

An annual observance of "Infection Prevention Week," organized by the Infection Control Committee, can serve as a platform for raising awareness among healthcare workers about various aspects of infection control. This initiative should involve workshops, seminars, and interactive activities designed to reinforce the significance of infection prevention measures, engage staff, and disseminate vital information regarding current infection control strategies.

5.**Awareness of Good Waste Management Practices**

Creating awareness about effective waste management practices is crucial in preventing NSIs and other injuries. Staff should be educated on the importance of proper disposal methods for sharps, emphasizing the risks associated with improper handling, such as injuries from garbage bags, recapping needles, and unsafe injection practices. Education campaigns can reinforce the need for vigilant waste management protocols.

6.Encouragement of Responsible Storage

The responsible storage of medical supplies and hazardous materials is essential in preventing accidental injuries and contamination. Healthcare facilities should establish guidelines for the secure storage of sharps and other potentially hazardous items, ensuring they are inaccessible to unauthorized personnel and protected from environmental factors that may compromise safety.

7.**Counseling and Psychological Support**

Providing counselling and psychological support for healthcare workers is critical in addressing the emotional and psychological toll associated with exposure to infectious materials and the risk of NSIs. Implementing support programs can help staff cope with the stress of their work environment, ultimately enhancing their resilience and commitment to maintaining high standards of infection control.

Authors Contribution

Dr AK conceptualized and designed the study and Dr ABD supervised and contributed final analysis and editing of the study. Dr PPK contributed for few analysis.

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