



Original Research Article

PREVALENCE AND RISK FACTORS OF NEEDLE STICK INJURIES AMONG HEALTHCARE WORKERS OF A TERTIARY CARE HOSPITAL IN KANYAKUMARI DISTRICT

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ABSTRACT

Background: Needle stick injuries (NSIs) pose a significant occupational hazard, exposing healthcare workers to the risk of blood borne infections and other associated health complications. Understanding the prevalence and identifying the contributing risk factors is crucial for developing targeted interventions and enhancing safety protocols to mitigate the incidence of such injuries.

Aims & Objectives: •To estimate the prevalence of needle stick injuries among healthcare workers of a tertiary care hospital.

•To describe the risk factors associated with occurrence of Needle Stick Injury.

Materials and Methods: The hospital-based cross-sectional study was conducted at Kanyakumari Government Medical College & Hospital for a period of 2 months (August – September 2022). The study population comprised 301 individuals, including consultants, postgraduates, interns, nursing students, staff nurses, paramedical workers, technicians, and cleaning staff. Simple random sampling was employed as the sample technique by using Random number table. Informed consent was obtained from the study participants in the regional language after explaining the purpose of study. Institutional Ethical Committee clearance was obtained before data collection. Data was collected using a pre-tested and semi-structured questionnaire, details about devices involved in recent injuries, factors associated with needle stick injuries, types of injuries, duty timings, time of reporting, and actions taken after injuries were obtained and data were entered into MS EXCEL and analyzed using SPSS version 22.0.

Results: Paramedical Workers and Staff Nurses constitute the highest percentages of NSIs at 27% and 12%, respectively. The locations where NSIs frequently occur include the Emergency Ward (26%) and Intensive Care (27%). Hypodermic needles are identified as the primary cause (39%), with procedures (38%) and recapping (22%) being the leading activities linked to NSIs. Lack of awareness about the reporting process is identified as a significant reason, with 6.38% of participant were not aware of the reporting procedures.

Conclusion: The study not only highlights the prevalence and characteristics of NSIs among healthcare workers but also emphasizes the importance of understanding reporting barriers. The findings to be reported targeted interventions to enhance occupational safety, improvement in reporting practices ultimately contribute to a safer working environment for healthcare professionals.

Keywords: Needle stick injury, Health care workers, Reporting.

INTRODUCTION

Needle stick injuries (NSIs) pose a significant occupational hazard, exposing healthcare workers to the risk of blood borne infections and other associated health complications. Understanding the prevalence and identifying the contributing risk factors is crucial for developing targeted interventions and enhancing safety protocols to mitigate the incidence of such injuries. Needle stick injuries are the injuries caused by objects such as Hypodermic needles, butterfly needles, IV Cannulas, Suture needles, Blood collection needles, Razors, and Scissors.^[1]

Healthcare workers, including doctors, nurses, and support staff, are routinely exposed to needle-related procedures as part of their daily duties. Workload and time pressure are likely to cause Needle Stick Injury. Workload represents the amount of mental effort required to conduct a task. It has a close association with the concept of attention as a restricted capacity pool of energy or resources.^[2]

Despite the advancement in medical practices, needle stick injuries remain a persistent problem, posing not only immediate health risks but also potential long-term consequences for the affected individuals. Needle Stick Injuries exposing workers to blood borne pathogens pose a major risk to Health Care Workers.^[3] These incidents can transmit many blood-borne infectious diseases, especially viruses like Hepatitis B, Hepatitis C, and Human Immunodeficiency Virus (HIV).^[4] This research aims to contribute valuable insights into the frequency of NSIs among healthcare workers and to delineate the specific risk factors associated with these incidents.

Identifying the prevalence and risk factors will help in the development of targeted preventive measures, training programs, and improved safety protocols. Additionally, Understanding the circumstances surrounding NSIs can contribute to a more comprehensive occupational health strategy, ultimately enhancing the overall well-being and safety of healthcare professionals.^[2] By shedding light on this occupational hazard, the study seeks to provide evidence-based recommendations for policy improvements and institutional practices aimed at reducing the incidence of needle stick injuries among healthcare workers.

Therefore, the present study was conducted to evaluate the occurrence of needle stick injury and to find out the factors associated with occurrence of needle stick injury using pretested questionnaire among health care workers in tertiary care centre in Kanyakumari district.

Aims and Objectives

- To estimate the prevalence of needle stick injuries among healthcare workers in tertiary care hospital.
- To describe the risk factors associated with the occurrence of Needle Stick Injury.

MATERIAL AND METHODS

The hospital-based cross-sectional study was conducted at Kanyakumari Government Medical College & Hospital for a period of 2 months (August – September 2022). The study population comprised 301 individuals, including consultants, postgraduates, interns, nursing students, staff nurses, paramedical workers, technicians, and cleaning staff. Simple random sampling was employed as the sample technique by using Random number table. Informed consent was obtained from the study participants in the regional language after explaining the purpose of study. Institutional Ethical Committee clearance was obtained before data collection. Data was collected using a pre-tested and semi-structured questionnaire, details about devices involved in recent injuries, factors associated with needle stick injuries, types of injuries, duty timings, time of reporting and actions taken after injuries were obtained and data were entered into MS EXCEL and analyzed using SPSS version 22.0.

RESULTS

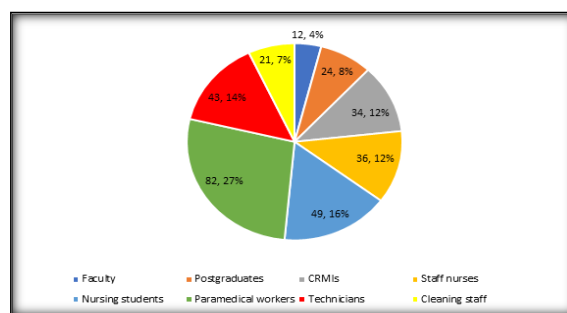


Figure 1: Distribution of The Study Participants According to Their Designation

The distribution of healthcare workers in the study reveals a diverse composition across various roles. Faculties account for 4% of the total, (12 individuals), while postgraduates constitute (8%, 24 individuals). Compulsory Rotating Medical Internship (CRMIs) constituted 12% of the healthcare workforce, (34 individuals). Nursing students represent 16%, (49 individuals) and staff nurses contribute 12% (36 individuals). Paramedical workers emerge as the most prevalent category, comprising 27%. Technicians constitute 14% (with 43 individuals) and the cleaning staff category includes 7% of the healthcare workers, comprising 21 individuals

The overall distribution encompasses 301 healthcare workers, providing a comprehensive overview of their roles within the healthcare setting as shown in figure 1.

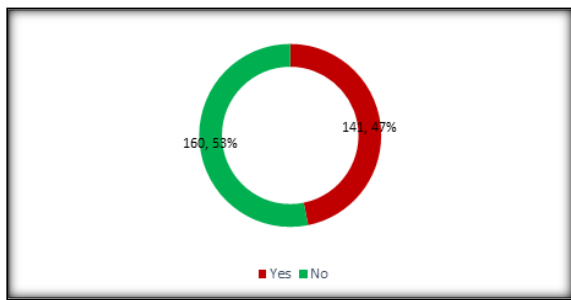


Figure 2: Prevalence of Needle Stick Injury Among the Study Participants

Figure No.2 shows that 141 (47%) participants had needle stick injuries during the study period. Table No.1 presents a detailed breakdown of Needle Stick Injuries (NSIs) among healthcare workers in the study, offering a comprehensive view of various variables associated with these incidents. Notably, Paramedical Workers and Staff Nurses constitute the highest percentages of NSIs at 27% and 12%, respectively. The locations where NSIs frequently occur include the Emergency Ward (26%) and Intensive Care (27%). Hypodermic needles are identified as the primary cause (39%), with procedures (38%) and recapping (22%) being the leading activities linked to NSIs. A significant proportion of participants experienced NSIs once (64%), primarily reporting superficial injuries (84%). Morning shifts are most susceptible to NSIs (50%). Factors such as Lack of Assistance, Unavoidable circumstances, Lack of Time and Fatigue contribute to these incidents. Encouragingly, a substantial majority of participants reported NSIs (84%), predominantly immediately after the incident (77%).

Actions taken after NSIs include washing with soap, water, and applying spirit (41.8%), showcasing important patterns in responses to these occupational hazards among healthcare workers. [Table 1]

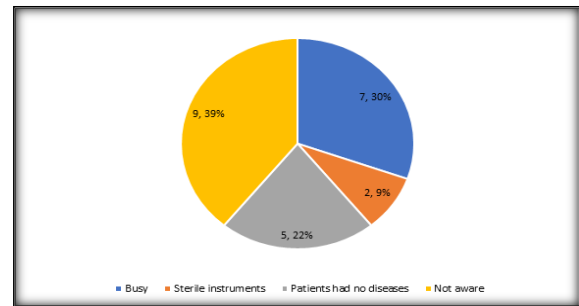


Figure 3: Distribution of reasons for not reporting NSI

Figure No. 3 shows the most common reason cited is being too busy at the time of injury, accounting for 4.9% of the instances where reporting did not occur. Another contributing factor, with a lower percentage, is the use of sterile sharp instruments that were not in use, representing 1.4% of the cases. Additionally, 3.5% of healthcare workers did not report NSIs when the sharp objects causing the injuries were used on patients without blood transfusion diseases. The lack of awareness about the reporting process is identified as a significant reason, with 6.38% of participants stating they were not aware of the reporting procedures. These findings highlight practical and knowledge-related barriers to reporting NSIs, emphasizing the need for targeted interventions to address these issues and promote a culture of reporting to enhance occupational safety among healthcare workers.

Table 1: Details of Needle Stick Injury (NSI) of the study participants

Variable	No. of participants with Needle stick injury n=141 (%)
Healthcare workers	
Faculties	6 (4)
Postgraduates	11 (7)
CRMIs	16 (12)
Nursing Students	23 (17)
Staff Nurses	17 (12)
Paramedical Workers	38 (27)
Technicians	20 (14)
Cleaning Staff	10 (7)
Place of injury	
Emergency ward	36 (26)
Intensive care	38 (27)
Labour ward	13 (9)
Operation theatre	16 (11)
Laboratory	24 (18)
General ward	9 (6)
Outpatient department	5 (3)
Device leading to injury	
Hypodermic needle	54 (39)
Blood collection needles	38 (27)
Butterfly needle	17 (12)
Suture needle	11 (8)
IV cannula	8 (6)
Lancets	6 (4)
Razors	4 (3)
Scissors	2 (1)
Others	1 (0)
Activity leading to injury	
Recapping	30 (22)

Suturing	10 (7)
Procedures	54 (38)
Cannulation	8 (6)
Post use disposal	39 (27)
Number of NSI	
Once	91 (64)
More than once	50 (36)
Type of NSI	
Superficial	118 (84)
Moderate	18 (12)
Severe	5 (4)
Time of injury	
Morning shift	69 (50)
Afternoon shift	24 (17)
Night shift	39 (27)
Don't remember	9 (6)
Factors associated with NSI	
Lack of assistance	46 (33)
Unavoidable	40 (28)
Lack of time	38 (26)
Fatigue	17 (12)
Reporting of NSI	
Yes	118 (84)
No	23 (16)
Time of reporting of NSI	
Immediately after incident	108 (77)
Before leaving work	7 (5)
After 2 days	3 (2)
Never reported	23 (16)
Action taken after NSI	
Wash with soap, and water and apply the spirit	59 (41.8)
Wash with soap and water	33 (23.3)
Wash with water and apply the spirit	18 (13)
Post-exposure prophylaxis	17 (12.3)
Applied spirit	14 (9.6)
Nothing	0 (0)

DISCUSSION

The study presents a comprehensive analysis of the distribution of health care workers and the prevalence of Needle Stick Injuries (NSIs) within the healthcare setting. The diverse composition of healthcare roles is highlighted with faculties, postgraduates, and Compulsory Rotating Medical Internship (CRMIs) each contributing different proportions to the total workforce. Notably, Paramedical Workers emerge as the most prevalent category, constituting 27% of the study participants. The prevalence of NSIs is further illustrated in Figure 2, revealing that 47% of the participants experienced needle stick injuries during the study period. The prevalence of Needle Stick Injuries (NSIs) among healthcare workers is a critical concern, as these incidents pose significant risks to the occupational safety and well-being of the healthcare workforce. The study's findings indicate the persistent nature of this occupational hazard within healthcare settings. This prevalence aligns with the global recognition of NSIs as a widespread issue, despite ongoing efforts to improve safety measures.

In the present study, out of 301 study Subjects 47 % (141) had a needle stick injury, Similar to this study done by Manal Khurshed et al,^[4] in Uttar Pradesh showed 36 % and in contrast to this, according to Kifah Habib et al,^[3] in Saudi Arabia showed 8.4% had Needle Stick Injury where incidence is very low comparing current study.

Table 1 provides a detailed breakdown of NSIs, revealing important patterns. Paramedical Workers and Staff Nurses, with percentages of 27% and 12% respectively, represent the highest proportions of NSIs. Understanding these role-specific differences is crucial for tailoring preventive strategies and targeted training programs to address the specific needs of different healthcare professionals. The locations where NSIs frequently occur include the Emergency Ward, Intensive Care. Hypodermic needles are identified as the primary cause. The identification of high-risk areas, such as the Emergency Ward and Intensive Care, emphasizes the importance of context-specific interventions to enhance safety protocols in these departments.^[5] Moreover, recognizing hypodermic needles as the primary cause of NSIs, accounting for 39% highlights the need for continuous improvement in needle safety practices and equipment design. The majority of NSIs are reported as superficial, occurring once and predominantly during the morning shift. Factors contributing to NSIs include lack of assistance, unavoidable circumstances, lack of time, and fatigue. Encouragingly, a substantial majority of participants reported NSIs, predominantly immediately after the incident. The study's observation that the majority of NSIs reported were superficial (84%) and occurred once (64%) provides insights into the severity and frequency of these incidents. While superficial injuries may appear less severe, they still carry the risk of transmitting

blood borne pathogens.^[6] Understanding the patterns of NSI occurrences, such as the prevalence during morning shifts (50%), informs strategies for targeted interventions during specific periods of heightened risk.

Figure 3 provides insight into the reasons for not reporting NSIs. The most common reason is being too busy at the time of injury, followed by the use of sterile sharp instruments that were not in use. Moreover, a notable proportion did not report NSIs when sharp objects causing injuries were used on patients without blood transfusion diseases. Lack of awareness about reporting procedures emerged as a significant barrier, under scoring the need for educational interventions to promote a reporting culture.^[7] Injuries during procedures were reported as a common cause of NSIs among 38% and 53% of Needle Stick Injuries occurred while doing duty in an Emergency ward and Intensive Care Unit, which is similar to the analysis done by Abdullah et al.^[8] The reasons for not reporting, as outlined in Figure 3, indicate challenges related to being too busy at the time of injury and a lack of awareness about reporting procedures. These barriers tells the need for ongoing education and awareness campaigns to promote a timely reporting of Needle Stick injury among health care professionals.^[9,10]

CONCLUSION

The prevalence of needle stick injuries was high among healthcare workers. Most common injuries were reported from emergency wards and intensive care units. Common devices involved were hypodermic needles and blood collection needles. The study not only highlights the prevalence and characteristics of NSIs among health care workers but also emphasizes the importance of understanding reporting barriers. The findings to be reported targeted interventions to enhance occupational safety, improvement in reporting practices ultimately contribute to a safer working environment for healthcare professionals.

Recommendation

Increasing awareness among health care workers and providing regular training on the safe use of sharp devices is highly recommended. Improving the

current reporting system for needle stick injuries to ensure early use of post-exposure prophylaxis is also recommended.

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