# A STUDY ON INCIDENCE AND RESPONSE TO NEEDLE STICK AND SHARP INJURIES IN APOLLO MULTI-SPECIALITY HOSPITALS, KOLKATA

Dissertation Submitted to

**The IIHMR University, Jaipur**

for the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

by

**Dr. Rupali Maheshwari**

Under the Supervision and Guidance of

**Mr. Ashish Bandhu**

(Assistant Professor, IIHMR University)

2023

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# DECLARATION BY STUDENT

I hereby declare that this dissertation titled '**A STUDY ON INCIDENCE AND RESPONSE TO NEEDLE STICK AND SHARP INJURIES IN APOLLO MULTI- SPECIALITY HOSPITALS, KOLKATA'** is the Bona fide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Dr. Rupali Maheshwari

Date-

Apollo HOSPITALS

Date: 20-05-2023

## TO WHOM IT MAY CONCERN

This is to certify that **Ms. Rupali Maheshwari** has done her internship with us from 01st March, 2023 to 20th May, 2023 in the **"Quality Cell"**.

She has completed her project on **"Incidence and Response to Needle Stick, and Sharp Injuries"** at Apollo Multispecialty Hospitals Limited, Kolkata.

We wish her all the best for her future.

For Apollo Multispeciality Hospitals Limited, Kolkata.

**Mr. Deepak Majumder**
**Manager - Human Resources**

# CERTIFICATE

This is to certify that dissertation titled **'A study on incidence and response to needle stick and sharp injuries in Apollo Multi-speciality Hospitals, Kolkata'** is a record of the research work undertaken by Dr. Rupali Maheshwari in partial fulfilment of the requirements for the award of the degree of MBA in Hospital and Health Management from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

| | |
|---|---|
| Faculty Guide | School Dean |
| IIHMR University, Jaipur | IIHMR University, Jaipur |
| Date | Date |

# ACKNOWLEDGEMENT

I am thankful to Ms Soma Das (Quality Head- Eastern Region) who gave me this opportunity to work in the Quality department at Apollo Hospitals, Kolkata, without which this project was not possible. I am thankful to Dr. Alpana Adhya, Mr Akash and Mr. Ritwick Saha for guiding me and supporting me throughout the dissertation.

I would also like to convey my gratitude to Mr. Ashish Bandhu, my mentor from IIHMR University, for his valuable guidance, essential assistance, and constant support & motivation.

At the end, I would also like to express sincere gratitude to Apollo Multi-speciality Hospital, Kolkata and all the staff members for giving me this opportunity for doing summer internship from their prestigious organization.

Sincerely,

Dr. Rupali Maheshwari

# ABSTRACT

**Introduction**: Needle stick injuries and sharp injuries are wounds that mostly affect skin and are mostly caused by used needles or scalpels. Healthcare workers have high risk of needle stick and sharp injuries because they are involved in patient care which requires them to work with sharp instruments. These injuries have chances to transmit diseases like HIV, HBV and HCV which are blood borne diseases and can have serious consequences. According to WHO, global incidence of HBV, HCV, and HIV due to NSI's was 36.7%, 39% and 4.4% respectively. Needle stick injuries often occur among doctors and nurses while performing procedures because of inadequacy of safety measures, and among housekeeping staff while cleaning and handling bio medical waste. Needle stick injuries can be prevented with appropriate training, knowledge, and control strategies.

**Materials and methods**: A descriptive study is done by collecting secondary data through hospital incident reporting system and accidental inoculation exposure form. Data included all healthcare workers who were injured from January 2022 to March 2023. A questionnaire was prepared to assess knowledge of housekeeping and nursing staff regarding needle stick injuries and post injury protocol to be followed.

**Results**: 39 cases of needle stick injury were reported from January 2022 to March 2023. 38% of all injuries were reported among housekeeping staff, 36% were reported among nurses and rest 26% were reported among doctors, healthcare assistant and technicians. 72% of all injuries occurred due to violation of NSI prevention policy and rest 28% occurred accidently and because of sudden movement by patients. Only in 57% of cases risk assessment was documented by Emergency physician. In 69% of cases blood sample was collected within 3 hours after injury for serology report. In 72% of cases post NSI counselling was done within 3 days after injury. Approximately 25% of those who were injured were prescribed injection tetanus, which is not required according to the protocol. Patient serology report was not available in 13 cases, out of which only 1 victim started with anti- retroviral therapy. Hepatitis B vaccination/ booster dose was advised in 18 out of 39 cases. Only 8 of all cases (44.5%) took vaccination dose as scheduled. No seroconversion was reported. During knowledge assessment only 84% of nurses and 46% of housekeeping staff confirmed that their Hepatitis B vaccination is complete. In others it was either incomplete or they could not recall. All the nurse who participated in the study had knowledge about safe handling of needles, waste management and protocol to be followed post NSI. Only 72% of nurses had knowledge about one hand scoop technique and 80% had knowledge about diseases which can be transmitted through NSI. All the housekeeping staff had knowledge about waste management and protective barrier to be used while handling biomedical waste. 87% of housekeeping staff had knowledge about protocol to be followed post NSI but none of the housekeeping staff had knowledge about diseases (HIV, HCV and HBV).

**Conclusion:** Needle stick injuries are considered as risk factors for transmission of approximately 20 known blood borne pathogens. Nurses and housekeeping staff are at high risk of getting needle stick injury. Practices like recapping and wrong disposal of needles which are avoidable are largely adding to the injuries. Needle stick injuries can be minimized by following prevention strategies like training of health care workers, adopting safety measures, and using safety engineered devices while performing procedures and safe disposal of sharp instruments.



**key words-** Needle stick injuries, sharp injuries, blood borne diseases, post exposure

# TABLE OF CONTENTS

# LIST OF TABLE AND FIGURES

# ABBREVIATIONS

| | |
|---|---|
| AIDS | Acquired immunodeficiency syndrome |
| CDC | Centres for disease control and prevention |
| ELISA | Enzyme linked immunosorbent assay |
| HBV | Hepatitis B virus |
| HCV | Hepatitis C virus |
| HCW | Health care workers |
| HIV | Human immunodeficiency virus |
| HIPC | Hospital infection prevention and control |
| IV | Intra - venous |
| NSI | Needle stick injury |
| PEP | Post exposure prophylaxis |

# Chapter 1: Introduction

Needlestick injuries are injuries caused by used or unused needles that accidentally penetrate or puncture the skin. These are occupational hazard for healthcare workers who work with hypodermic syringes and others like insulin needles. These injuries occur while using, disassembling, or disposing of needles. If not disposed of correctly, needles can be found in garbage, bed side and linen and injure workers who encounter them unknowingly. “As per CDC, a needle stick injury (NSI) is defined as the penetration of the skin by a needle or other sharp object, which has been in contact with blood, tissue or other body fluids before the exposure.”(1)

“There are more than 20 blood borne diseases, but those of primary significance to health care workers are hepatitis due to either the hepatitis B virus or hepatitis C virus and acquired immune deficiency syndrome (AIDS) due to human immunodeficiency virus (HIV).”(2) “The risk of transmission of blood borne viruses ranges from 0.3% for human immunodeficiency virus (HIV), 2% for Hepatitis C Virus (HCV) and 6---30% for Hepatitis B Virus (HBV).”(3) “In India, it is estimated that out of 3---6 billion injections administered, 2/3rd injections are unsafe.”(4) “In developing countries, though the frequency of NSI is found to be high, 40---75% of them go unreported leading to underestimation of the rates.”(4) “HBV vaccination is recommended for all health care workers (unless they are immune because of previous exposure). HBV vaccine has proved highly effective in preventing infection in workers exposed to HBV. However, no vaccine exists to prevent HCV or HIV infection.”(5) “The Ministry of Health and Family Welfare of the Government of India recommends that the healthcare providers must be made aware of the safety precautions that must be followed for the prevention of NSIs. Adequate training to the healthcare workers to handle the sharp objects is also equally vital.”(6) Most needle stick injuries are avoidable if appropriate safety precautions are used by healthcare professionals.

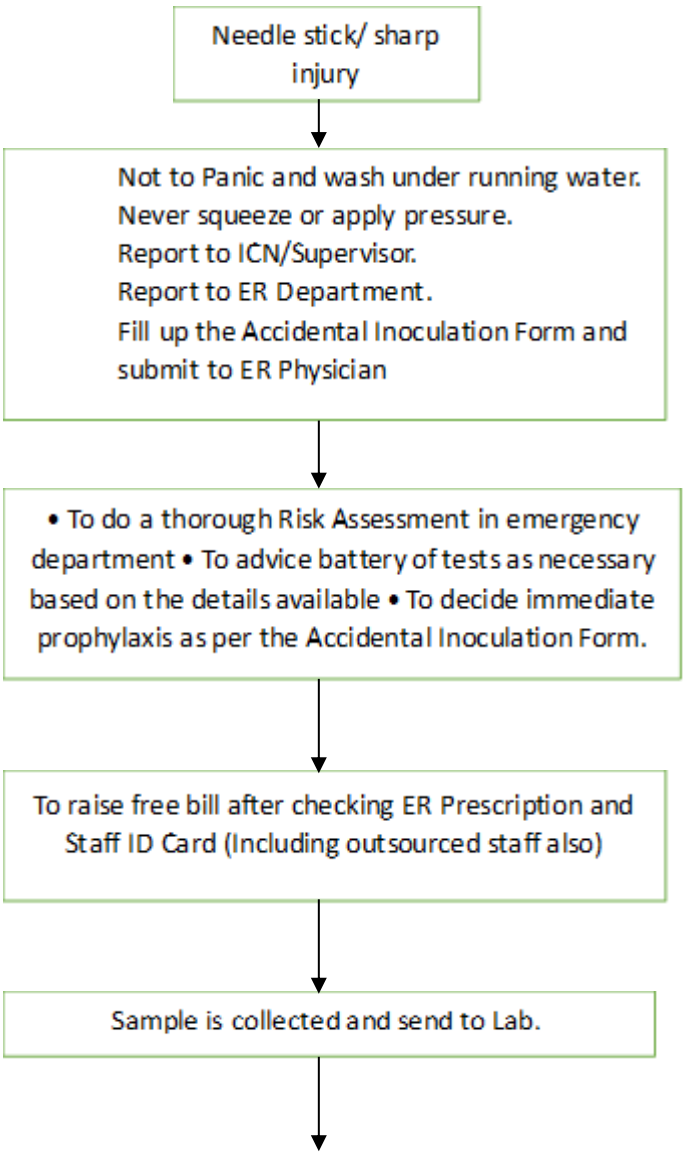
The main aim of this study is to analyse the trend of needle stick injury, its most common causes, category of staff most injured, location wise distribution of needle stick injury, compliance to post exposure protocol, knowledge assessment of nurses and housekeeping staff regarding NSI and providing appropriate recommendations to reduce needle stick injuries in hospital.

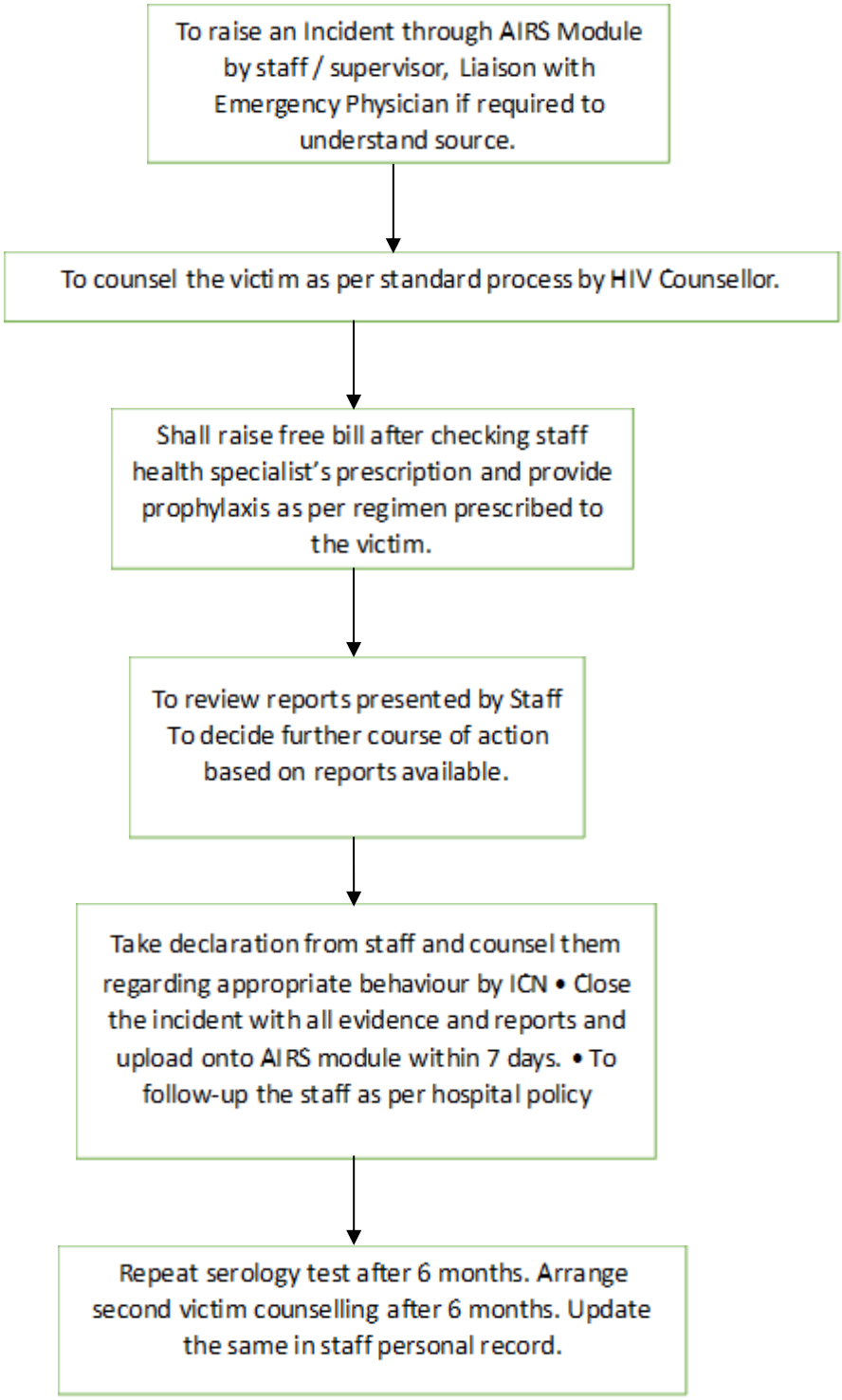
Hospital has its own protocols to follow to avoid needle stick injuries. All healthcare workers are required to complete their hepatitis B vaccination immediately after joining if not complete. There are protocols to be followed post injury and guidelines to assess risk and advice prophylaxis. Every incident is to be reported to the head of department and immediate action must be taken. All victims must go for follow up after six months to check for seroconversion.

(a) Policies to prevent needle stick injuries by hospital-

- Gloves to be worn when contamination of hands with body fluids and substances is anticipated.
- Take necessary precautions during procedures to prevent injuries and while cleaning or disposal of sharps and needles.
- Needles should never be broken, recapped, or bent by hand.
- Needles and sharps should always be disposed immediately after use in a puncture resistant sharp container.
- Heavy duty gloves should be worn when dealing with biomedical waste.
- Vaccinate all healthcare workers against hepatitis B.

(b) Process flow needle stick/ sharp injury






(c) Test to be done immediately-

- For HIV – test is done at day of exposure (base line test), then at 6 weeks, after 3 months and at 6 months. If however, patient was under PEP, test to be done at 1 year too. All tests done are ERS (ELISA rapid simple tests) after proper pre-test and post-test counselling.
- For Hepatitis B – base line test is done. The serological test of the source patient is done. The serological test for both hepatitis B surface antigen and anti-Hepatitis B

antibody titre are highly recommended on the day of exposure. An adequate antibody level is greater than 10 Mili International Units per ml (10 IU/L). Seroconversion can be detected by testing for Hepatitis B surface antigen at 6 months.

- For Hepatitis C – baseline test is done. The seroconversion can be detected by testing at 6 months.

(d) Assessment of the nature of risk and transmission (used in Emergency department of Apollo Hospital) -

| **Category** | **Definition** |
|---|---|
| Mild exposure | Injury of mucous membrane or non – intact skin with small volumes. Example – a superficial wound caused by plain or low calibre needle. |
| Moderate exposure | Injury of mucous membrane or non – intact skin with large volumes.<br>Example – a cut or needle stick injury which penetrates gloves. |
| Severe exposure | Percutaneous injury with large volumes. Example - an injury with high calibre needle contaminated with blood. |

Table – 1.1

# Chapter 2: Review of literature

| Author | Location | Sample size | Sampling technique | Salient features |
|---|---|---|---|---|
| Dharmendra Gupta1, Shashi Saxena1, Vijender Kumar Agrawal2, Meenakshi Singh1, Saurabh Mishra1, 2019 | Uttar Pradesh, India | 50 nursing staff and 50 nursing students | Purposive sampling | Study was done to assess the knowledge, practice of NSIs, prevalence of NSIs among nurses in a private tertiary care hospital and recommend the preventive measures to reduce the injuries. The incidence of needle stick injuries per year was 69%. Accidental injury was most common among nurses working in wards. Sharps contaminated with infectious fluids were reason for the injuries in the study group of nurses. Prevention is found to be the most effective way to protect them from injuries. Improper handling of sharps and needles after use were most common causes of injuries. |
| Kifah Habib Alfulayw1, Sultan T. Al-Otaibi and Hatem A. Alqahtani, 2021 | Damman city, Saudi Arabia | NA | NA | This was retrospective study done during period from April 2016 to May 2018 with healthcare workers at a governmental hospital. Incidence of NSIs was found to be 8.4% among participants over 26 months. The most affected staff were nurses during disposal of needles. Physicians were injured mostly due to surgical devices. Hepatitis B vaccination was not complete among all participants. Study suggested that preventive measure should be adopted, and all healthcare workers should be completely vaccinated against Hepatitis B. |
| Abdullah Alsabaani , Norah Saeed S. Alqahtani , Sarah Saeed S. Alqahtani , Jawaher Hussain J. Al-Lugbi , Malak Ali Saleh Asiri , | Abha city, Saudi Arabia | Total 786 Healthcare workers which included 231 physicians and 555 nurses | Stratified multistage cluster sampling technique | Data was collected using a questionnaire. The rate of needle stick injury in healthcare workers in past 12 months was 11.57%. Nurses, females, and Saudis were most injured. About 52% injuries were not reported. Majority of participants were aware of needle stick injury and 81% were aware about the protocol to be followed |

| | | | | |
|---|---|---|---|---|
| Shyamaa Elsayed Elaraby Salem , Ali Ahmed Alasmari , Syed Esam Mahmood and Mesheil Alalyani , 2022 | | | | post injury. 61.2% knew that the recapping of the needle should not be done. 89% of participants were fully vaccinated for hepatitis B. 8.7% bent the needles and 27% recapped the needles before disposal. |
| Hanny Handiyani , L. Meily Kurniawidjaja , Dewi Irawaty , Rita Damayanti , 2018 | NA | NA | NA | Study suggested that needle stick injury was high in low- and middle-income countries (91.85% in India). Main reasons for injury were negligence while opening ampules and IV cannulation. Education, safe needle use, effective communication and training were found to be important strategies to prevent needle stick injuries. |
| N. Jaggi, P. Nirwan and M. Chakraborty, 2020 | India | NA | NA | This was prospective Observational Study done during 2015–2018 in a tertiary Care Hospital. Study included all staff who were injured by needle stick injury. RPI (robust process improvement) toolkit was implemented during 2015–2018 which focused on safety engineered devices, root cause analysis, management after injury and immunization for Hepatitis B. The most risked staff were nurses in hospital. It was seen that there was 21.35% reduction in injuries after implementation of RPI toolkit. |
| Jayaprada, Rangineni,; Vineela, K.; Ramakrishna, N.; Yamini, S.; Bhargav, K. M., 2022 | India | NA | NA | Data was collected from HIPC office in hospital and a retrospective study was done during October 2018 to October 2019. Results showed 47 injuries from October 2018 to October 2019. Main reason was found to be recapping of needles and injuries were high in ICU (intensive care unit). Seroconversion was not seen in any of the cases while follow-up. To reduce incidence, training sessions were held for the staff. |

| | | | | |
|---|---|---|---|---|
| Madhavan, Anitha,; Asokan, Anjana; Vasudevan, Anu2; Maniyappan, Janeesh; Veena, K, 2019 | India | 100 staff nurses and 100 house surgeons. | Random sampling | Data was collected using a questionnaire and a cross-sectional study was done in hospital. Needle stick injury was high in interns (75.6%) than in nurses (24.4%). Interns were mostly injured while blood withdrawal and recapping of needles. Study showed that nurses had better knowledge regarding NSI than interns. |
| Kevin C. King; Ronald Strony, 2022 | USA | NA | NA | Study suggested that many needle stick injuries are not reported. Injuries occur even after following universal precautions. Despite awareness and the introduction of universal precaution guidelines, needlestick injuries continue to occur. In USA, half of the incidences go unreported. Needlestick injuries occur in hospitals. healthcare facilities like a clinic, day surgery, outpatient surgery, nursing homes, and cosmetic surgery clinics. Most impacted staff are surgeons, nurses, emergency medical technicians, laboratory personnel and surgery technologists. Housekeeping staff is also at high risk because they clean sharp boxes. |
| CDC report | NA | NA | NA | Report suggests recommendations for the management of health-care workers who have risk of exposure to blood and other body fluids which may contain hepatitis c virus (HCV), hepatitis b virus (HBV) or HIV. For HBV, hepatitis B vaccine and hepatitis B immune globulin should be initiated after exposure if required after serology report. The status of the source and the exposed person should be determined for HCV, and for healthcare worker exposed to HCV positive source, follow-up testing should be performed. |

# Chapter 3: Methodology

- **Study design**: Descriptive study
- **Setting**: The study was conducted in Apollo Multi-speciality Hospitals, Kolkata. It is a tertiary care hospital, established in 2003 having a capacity of 700 beds. It has 50 specialities and 33 centres of excellence.
- **Study population**: It included all healthcare workers injured from January 2022 to March 2023 and, nursing and housekeeping staff selected randomly for knowledge assessment.
  - **Inclusion criteria**: All healthcare workers who have reported needle stick injury through hospital incident reporting system. Nursing and housekeeping staff who were willing to participate in the study.
  - **Exclusion criteria**: Cases of needle stick injuries which were not reported. Nursing and housekeeping staff who were not interested to participate in the study.
  - **Study tools**: Secondary data from hospital incident reporting system, primary data collected through questionnaire, and informal conversation. Data analysis was done using Ms Excel.
- **Duration of study**: The study was conducted from April 2023 to May 2023.
- **Sample size**: All healthcare workers injured during January 2022- March 2023 and 50 nursing and housekeeping staff for knowledge assessment.
- **Sampling technique**: Simple random sampling for knowledge assessment.
- **Data collection procedure**: Secondary data was collected from hospital incident reporting system. Primary data was collected through questionnaires on knowledge regarding needle stick injuries and informal conversation with staff.
- **Operational definitions**:
  - **Needle stick injuries** refers to a penetrating wound by a sharp instrument which can potentially be contaminated with another person's blood or body fluid..
  - **Post exposure prophylaxis** are drugs or vaccines given after needle stick injury to control the spread of diseases like HIV, HBV, and HCV.
  - **Percutaneous injuries:** "Penetration of skin by a needle or other sharp object that was in contact with blood, tissue, or other body fluid prior to the exposure."(1)
  - **Mucous membrane exposures**: "Fluid contact to the external oral, ocular, or nasal membranes with blood and/or fluids, tissues or specimens listed above." (1)
  - **Non-intact skin exposures:** "Contact of wounds, previously opened/abraded skin with the fluids, tissues, or specimens listed above."(1)

- **Healthcare workers**: “All persons (e.g., employees, students, contractors, attending clinicians, public safety workers, or volunteers) whose activities involve contact with patients or with blood or other body fluids from patients in a healthcare, laboratory, or public safety setting.”(1)

# Chapter 4: Results

(a) Trend analysis of needle stick injury from January 2022 to March 2023 –

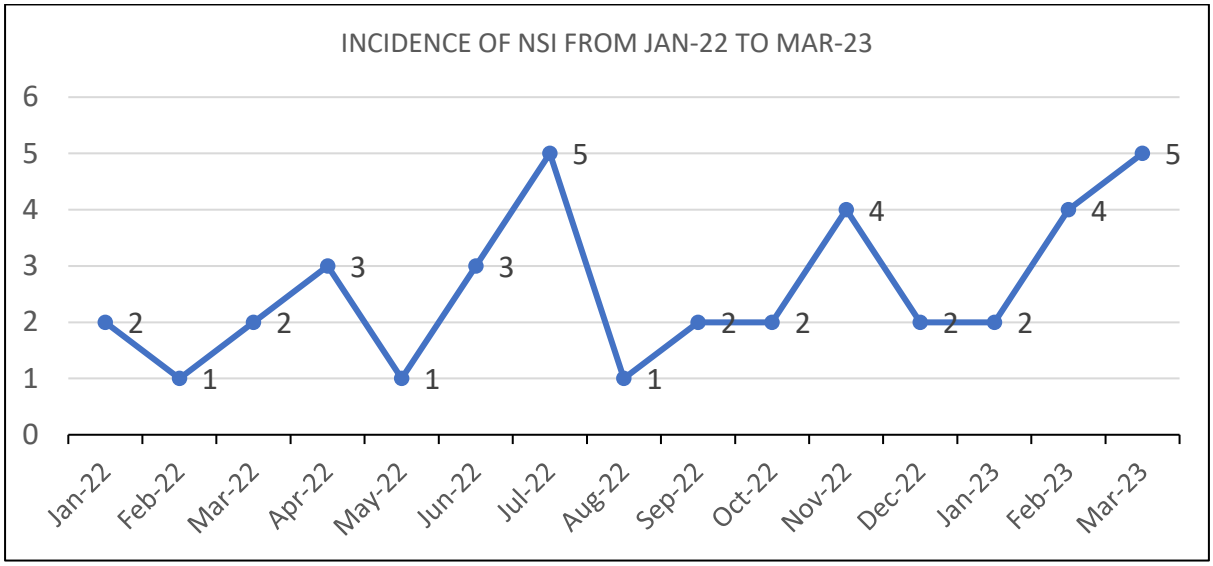



Fig – 4.1

There is an increasing trend in needle stick injuries. In first quarter of 2022, count of NSI was 5 whereas in 2023 count of NSI in first quarter is 11. Total of 39 cases were reported from January 2022 to March 2023.

(b) Time -wise distribution of needle stick injuries-

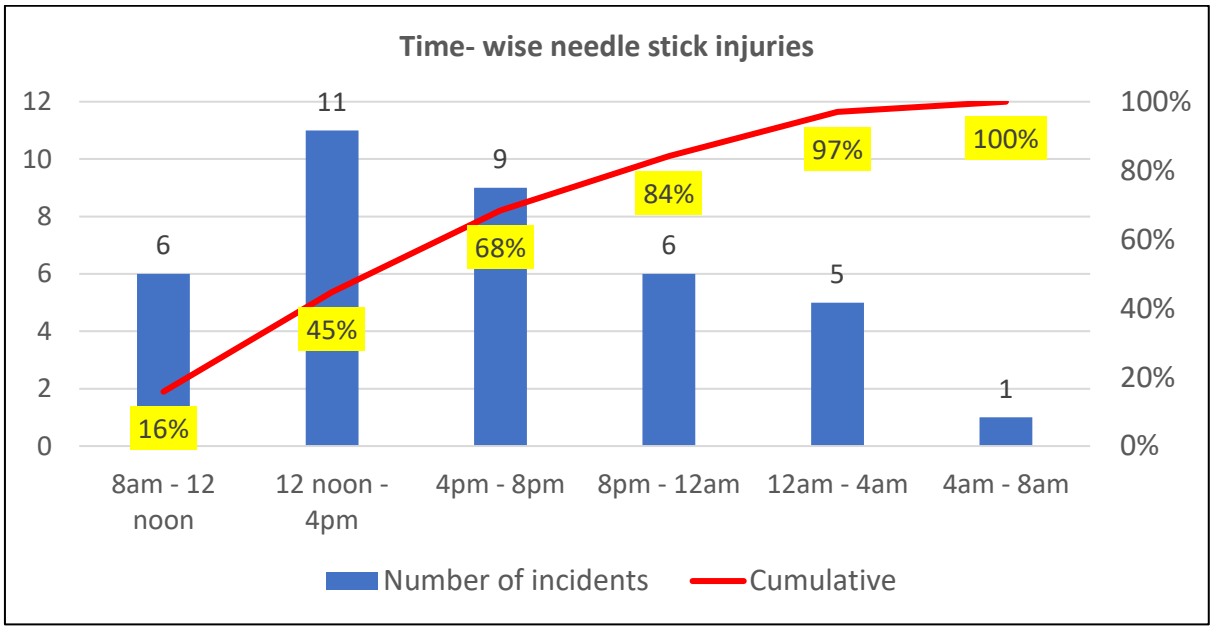



Fig – 4.2

Maximum needle stick injuries have occurred in afternoon shift. Mostly nurse's morning shift ends by 4 PM.

(c) Location wise incidence of needle stick injuries-

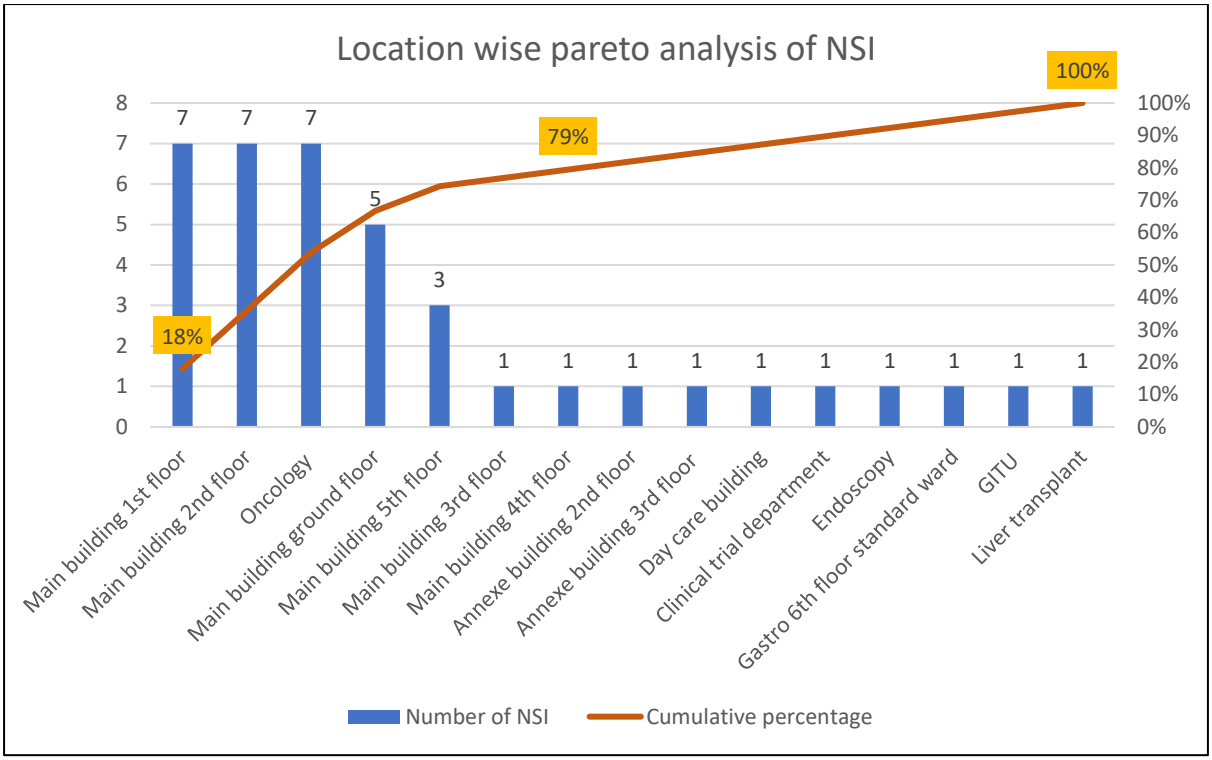



Fig – 4.3

Maximum needle stick injuries were reported in main building 1st floor (18%), main building 2nd floor (18%), oncology building (18%), main building ground floor (13%) and main building 5th floor (8%).

(d) Healthcare workers impacted by needle stick injuries-

Needle stick injuries was observed more in housekeeping staff (38%) followed by nurses (36%). Rest 26% who were injured included doctors (10%), technicians (8%), health care assistant (3%), attendant (3%) and electrician (3%).

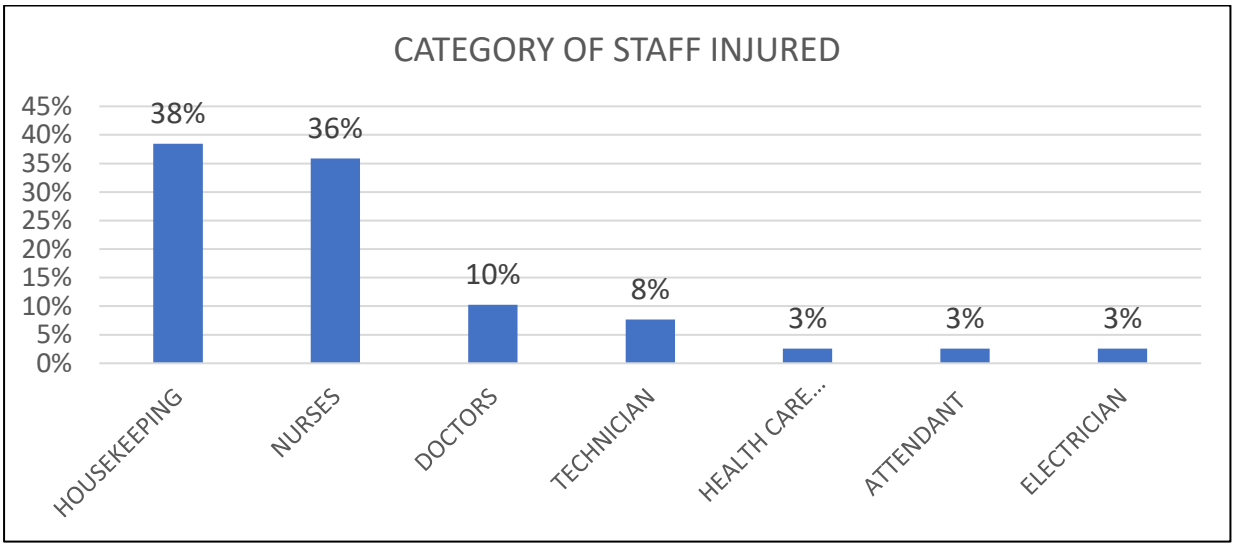



Fig – 4.4

(e) Factors associated with needle stick injuries-

Fish bone analysis

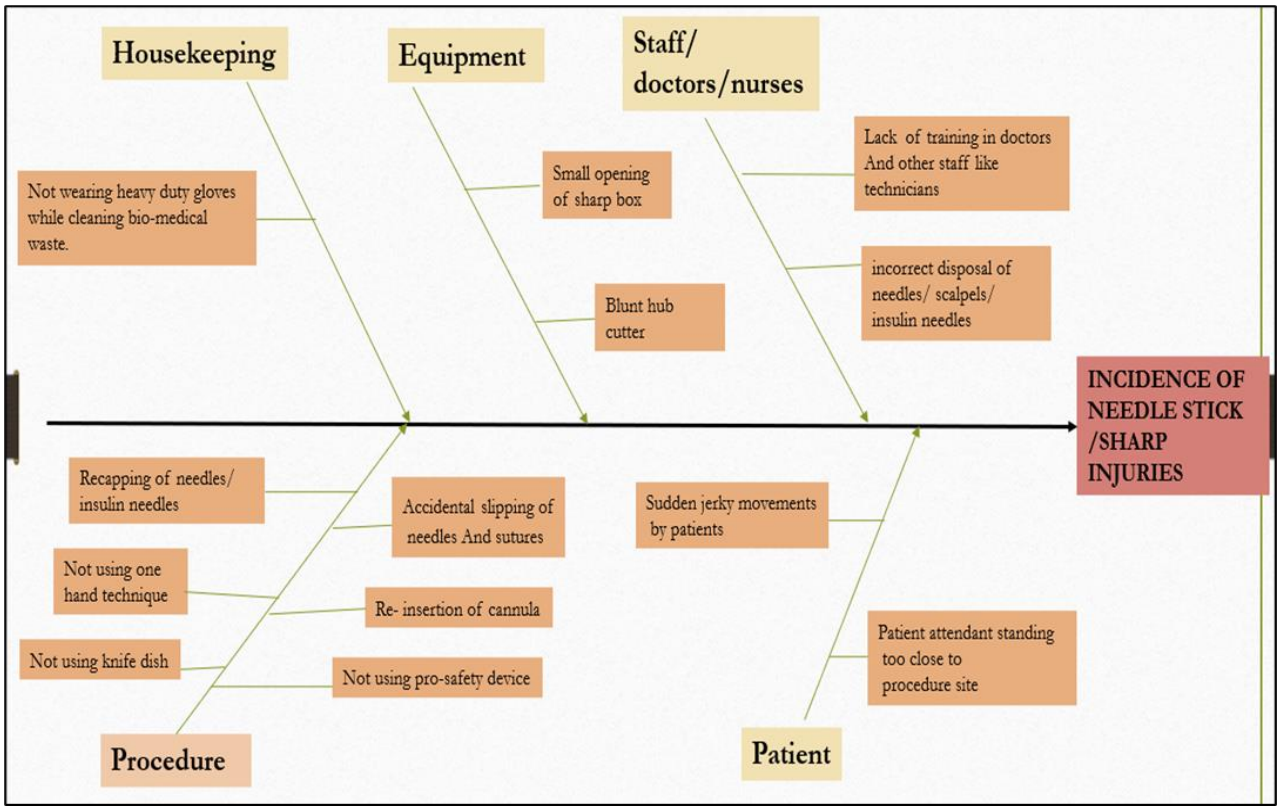



Fig – 4.5

Violation of needle stick prevention policy-

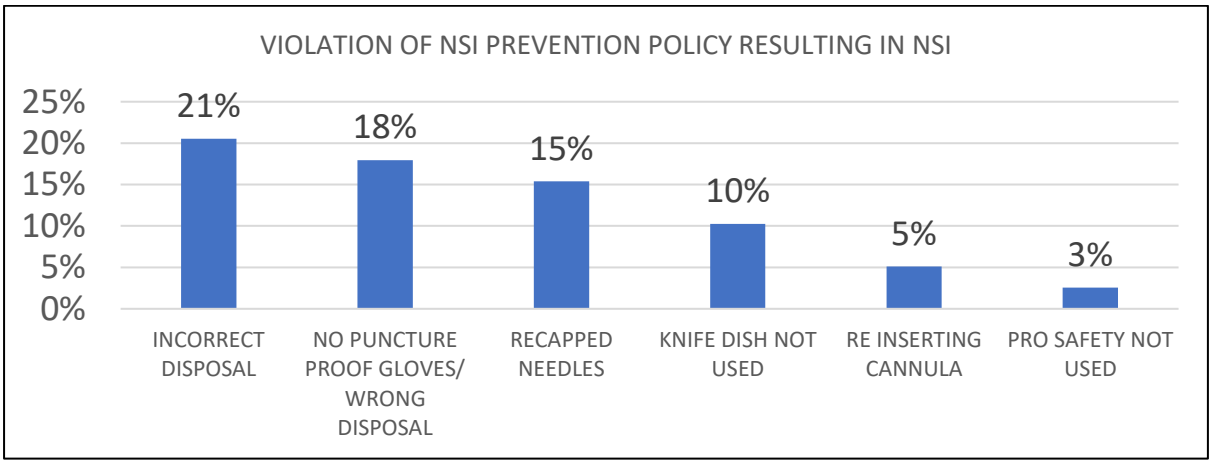



Fig -4.6

72% of NSI occurred due to violation of NSI prevention policy and rest 28% occurred accidently or because of patient movement. Housekeeping staff was mostly injured during cleaning of waste because of wrong disposal of sharps by doctors and nurses. Nurses were mostly injured because of recapping of needles and holding used needles in hand instead of using knife dish.

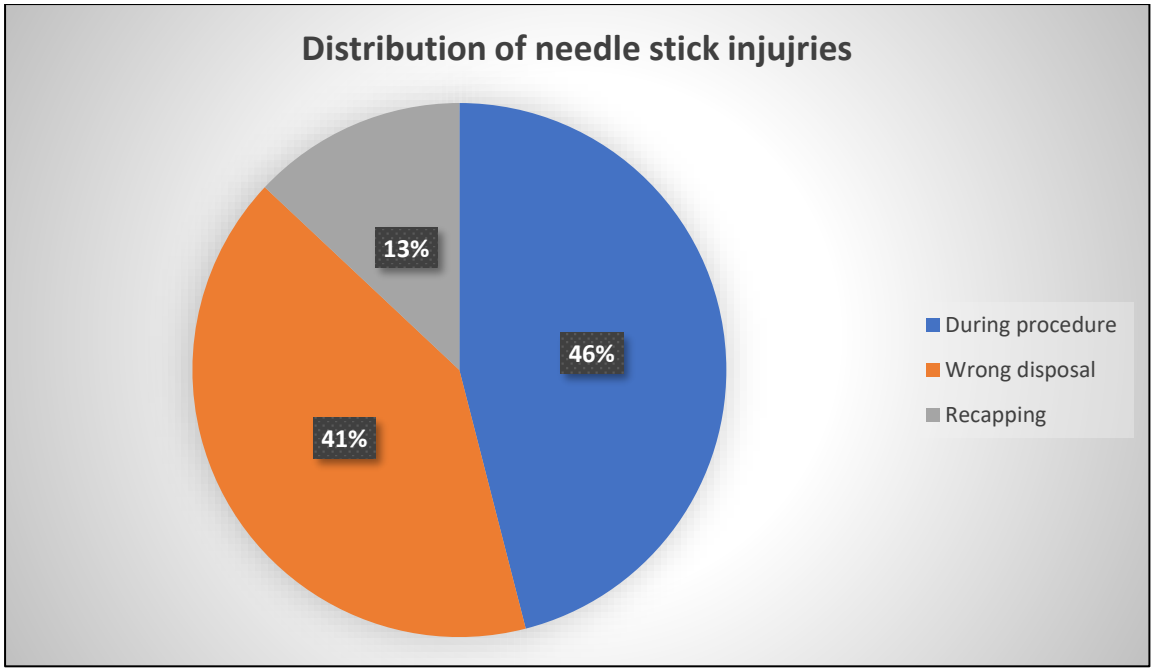



Fig – 4.7

Maximum number of needle stick injuries have occurred during procedure (46%) like sample collection, cannulation etc and because of wrong disposal of needles and sharps (41%).

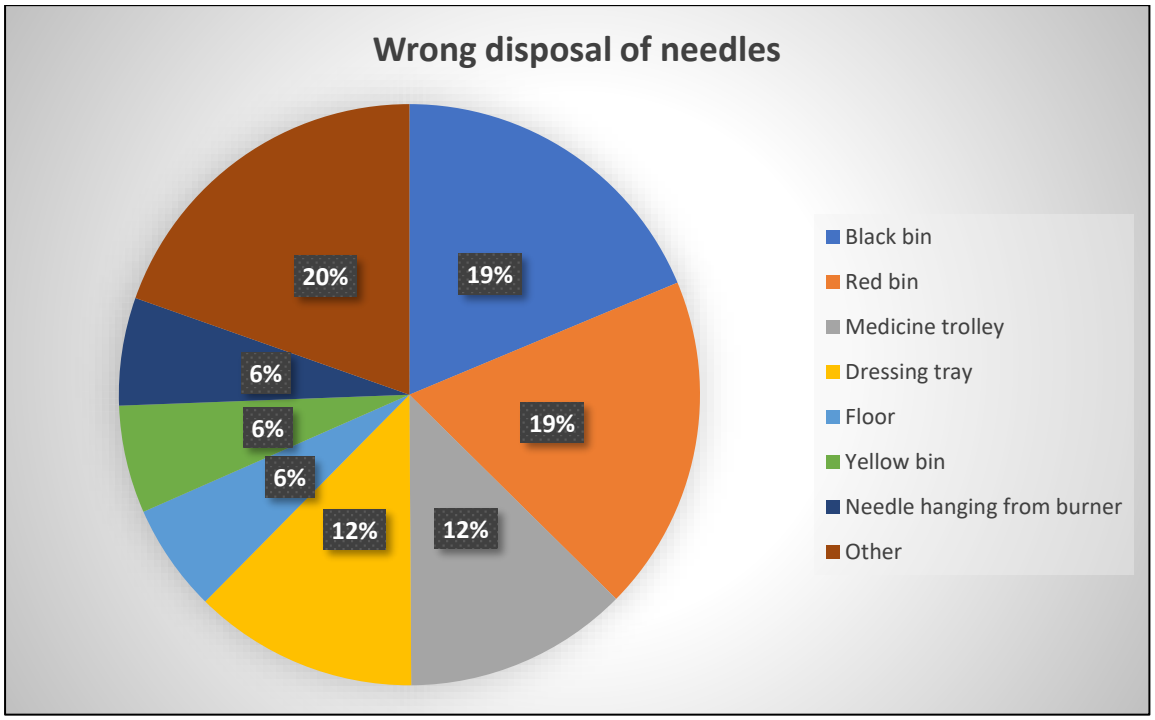



Fig – 4.8

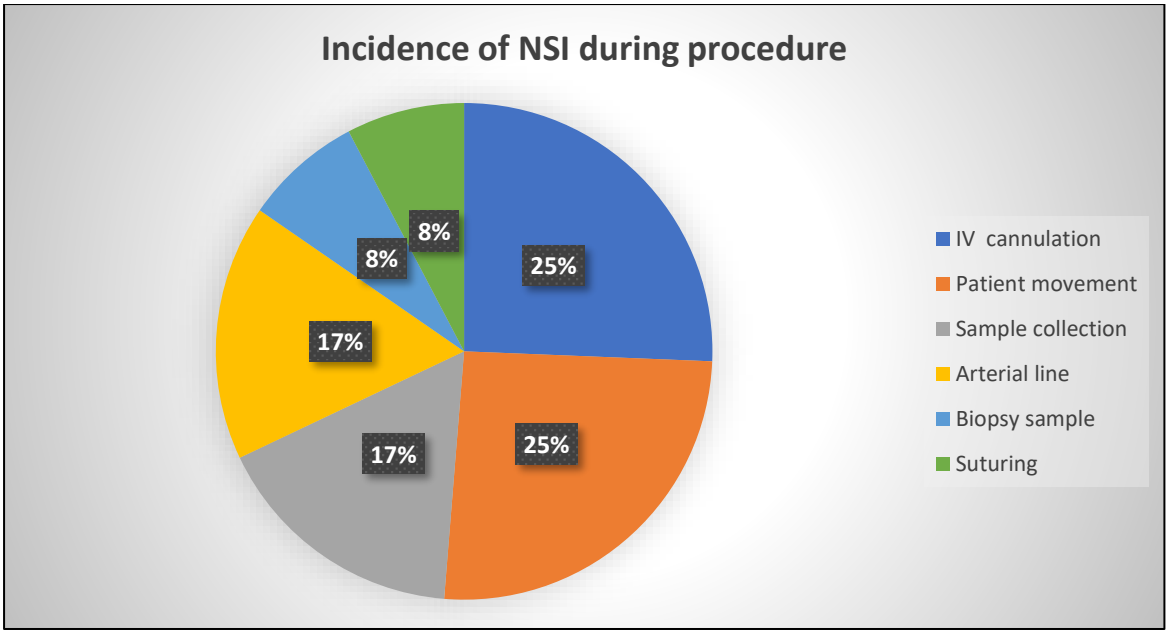



Fig – 4.9

Maximum injuries during procedure have occurred while IV cannulation and sudden movement by patients.

(f) Compliance to post exposure protocol for NSI-

All the healthcare workers who were injured reported the incidence to ICN/ supervisor and emergency. All of them were advised serology test and serology report was also done for patients when source was known. All victims were advised prophylaxis according to the serology report. Post injury counselling was done in all the cases. For all the victim serology report was repeated after 6 months and 2nd counselling was done. Risk assessment was documented only in 57% of the cases. Approximately 25% of those who were injured were prescribed injection tetanus, which is not required according to the protocol. Patient serology report was not available in 13 cases, out of which only 1 victim started with anti -retroviral therapy. In all cases where anti HBs titre was below protective level (10mlU/ml), hepatitis B vaccine booster or complete vaccination was advised.

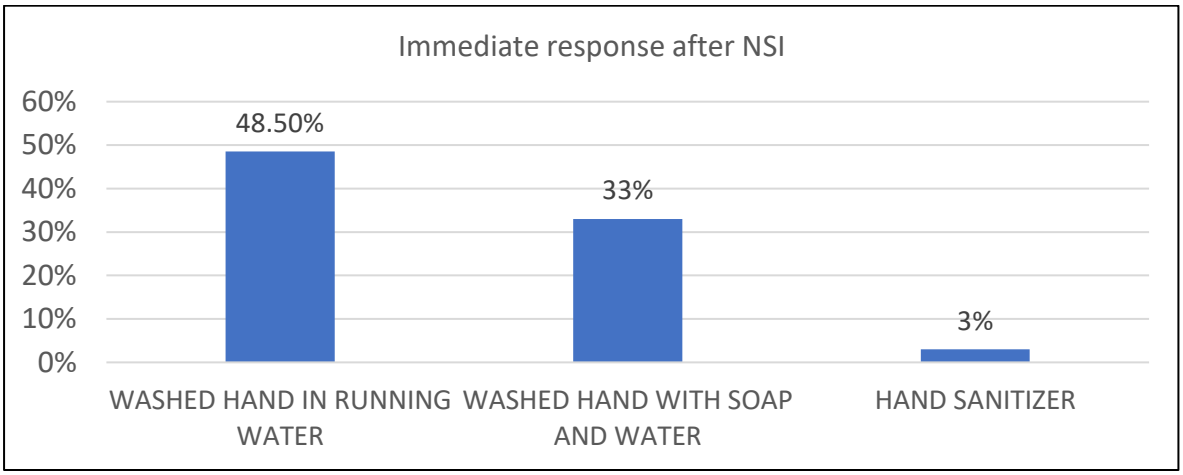



Fig – 4.10

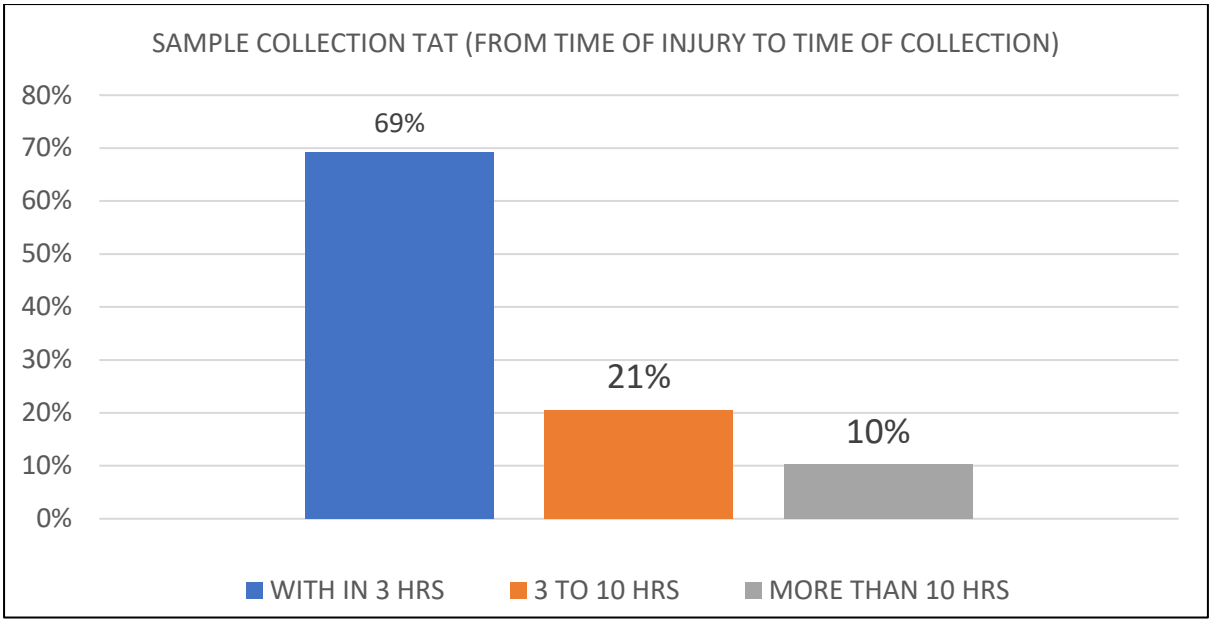



Fig – 4.11

Out of all the 39 staff who were exposed to NSI, 69% had got sample collection done within 3 hours, 21% got it done within 3-10 hours and 10% had got it done after more than 10 hours.

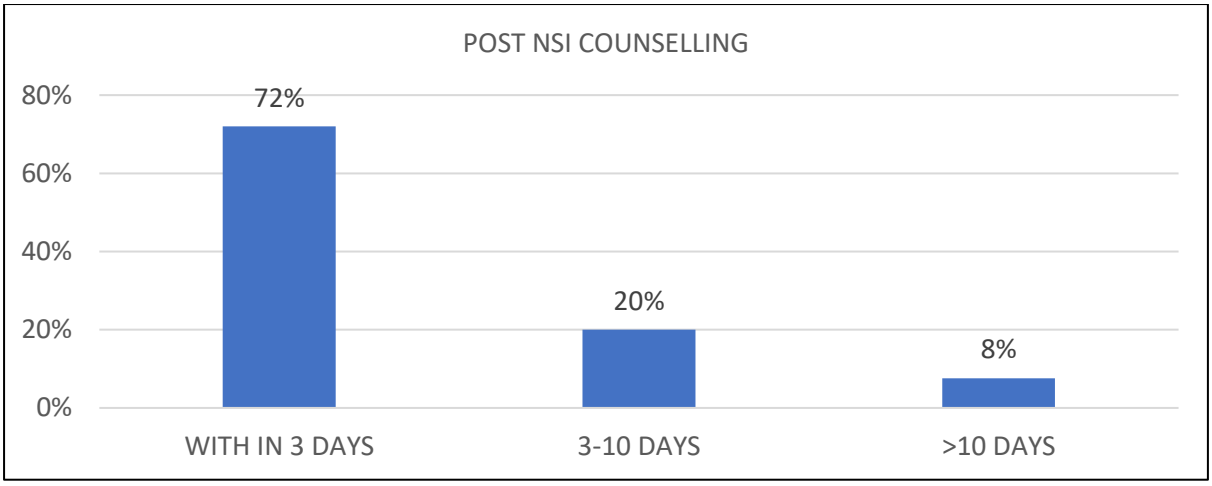



Fig – 4.12

72% of all who were exposed to NSI had got counselling within 3 days, 20% of them had got counselling between 3-10 days and 8% had got counselling after 10 days of exposure.

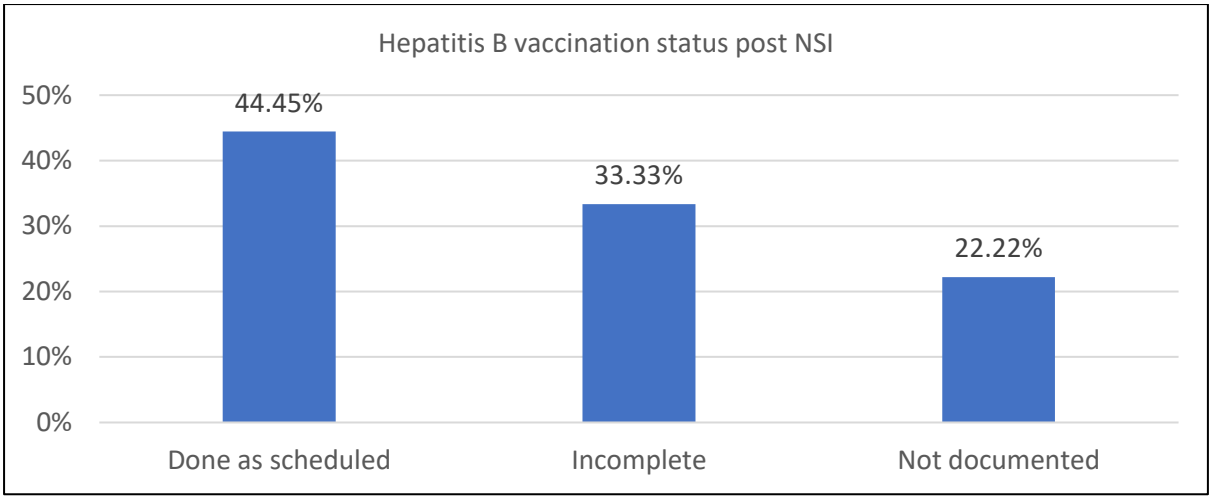



Fig-4.13

Hepatitis B vaccination/ booster dose was advised in 18 out of 39 cases. Only 8 of all cases (44.5%) took vaccination dose as scheduled in hospital. In rest of the cases, dose is either incomplete or not documented. It is reported by hospital that victims whose doses are either incomplete or not documented, take their doses from some other place outside hospital.

(g) Knowledge assessment of nurses and housekeeping staff regarding NSI-
25 nurses and 25 housekeeping staff participated in the study in the main building of hospital which assessed their knowledge regarding needle stick injuries, Safe handling of needles, waste management and protocols to be followed post needle stick injury. Nurses and Housekeeping staff were also asked about their last training on NSI and Hepatitis B vaccination status.

| Hepatitis B vaccination | Complete | Incomplete | Can't recall |
|---|---|---|---|
| Nurses | 84% | 8% | 8% |
| Housekeeping | 46% | - | 54% |

Table - 4.1

| Last training on NSI | Within 3 months | More than 3 months | Can't recall |
|---|---|---|---|
| Nurses | 24% | 32% | 44% |
| Housekeeping | - | - | 100% |

Table – 4.2

Knowledge assessment of housekeeping staff-

| Questions | Yes | No |
|---|---|---|
| Knowledge about protective barrier while handling waste | 100% | - |
| Knowledge about waste management | 100% | - |
| Knowledge about protocol to follow after NSI | 87% | 13% |
| Awareness about disease (HIV, HCV, HBV) which can be transmitted through NSI | - | 100% |

Table 4.3

Knowledge assessment of nurses-

| Questions | Yes | No |
|---|---|---|
| Ever had needle stick injury | 4% | 96% |
| Knowledge about safe handling of needles | 100% | - |
| Knowledge about one hand scoop technique | 72% | 38% |
| Awareness regarding diseases which can be transmitted by NSI | 80% | 20% |
| Knowledge regarding waste management | 100% | - |
| Knowledge about protocol to be followed after NSI | 100% | - |

Table 4.4

# Chapter 5: Discussion

Total of 39 cases of needle stick injury were reported from January 2022 to March 2023. 38% of all injuries were reported among housekeeping staff, 36% were reported among nurses and rest 26% were reported among doctors, healthcare assistant and technicians. 72% of all injuries occurred due to violation of NSI prevention policy and rest 28% occurred accidently and because of sudden movement by patients. "A report from the Centres for Disease Control and Prevention (CDC) in the United States lists the following percentages for injury rates from a study with data collected from 1995 to 2007: Injuries involving hollow-bore needles during or after disposal: 22%, after use, before disposal: 19%, during use: 52%." (3) Various studies on needle stick injuries also shows similar results. Most commonly injured staff are nurses and housekeeping due to needle recapping and handling of waste respectively.

Only in 57% of cases risk assessment was documented by Emergency physician. In 69% of cases blood sample was collected within 3 hours after injury for serology report. In 72% of cases post NSI counselling was done within 3 days after injury. Approximately 25% of those who were injured were prescribed injection tetanus, which is not required according to the protocol. Patient serology report was not available in 13 cases, out of which only 1 victim started with anti- retroviral therapy. Hepatitis B vaccination/ booster dose was advised in 18 out of 39 cases. Only 8 of all cases (44.5%) took vaccination dose as scheduled. No seroconversion was reported. No seroconversion was reported after 6 months follow -up. During knowledge assessment only 84% of nurses and 46% of housekeeping staff confirmed that their Hepatitis B vaccination is complete. In others it was either incomplete or they could not recall. All the nurse who participated in the study had knowledge about safe handling of needles, waste management and protocol to be followed post NSI. Only 72% of nurses had knowledge about one hand scoop technique and 80% had knowledge about diseases which can be transmitted through NSI. All the housekeeping staff had knowledge about waste management and protective barrier to be used while handling biomedical waste.

This study will help hospital identify root causes of needle stick injury and apply interventions which can reduce the incidence of NSI.

Needle stick injuries can be minimized by following prevention strategies like training of health care workers, adopting safety measures while performing procedures and safe disposal of sharp instruments. Other studies also suggest that main strategies to prevent needle stick injuries are trainings, education, safe needle use and disposal, and effective communication among healthcare workers.

# Chapter 6: Conclusion and Recommendations

Needle stick injuries are considered as risk factor for transmission of blood borne pathogens. Practices like recapping and wrong disposal of needles which are avoidable are major causes of the injuries. “Authorities should direct the efforts toward training of HCWs, use of safety engineered devices, and decreasing patient load per HCW as these steps are most likely to benefit the existing situation.”(7) Following best practices during procedures and while disposal of sharps can significantly reduce the burden of needle stick injury among health care professionals.

Needlestick injuries can lead to serious or fatal infections. All healthcare workers who are at risk should protect themselves. “Exposure prevention remains the primary strategy for reducing occupational bloodborne pathogen infections; however, occupational exposures will continue to occur.”(8) “The US Occupational Safety and Health Administration (OSHA) suggests that general work practice control and engineering control for all HCWs are the primary means that should be used to reduce risks of NSIs.”(9) Sharp containers should be specifically placed where sharps and needles are used and, they should be replaced when they are about three quarter full. Risk score was documented in only 57% of the cases. Risk assessment should be done for every case and PEP should be advised accordingly. Healthcare workers should be given reminders to complete their vaccination dose on time. Root cause analysis for each case should be done. Posters for awareness on NSI can be put on every floor.

Control impact matrix-

This is a prioritization tool that is used after causes are identified for a problem. Here the problem is Needle stick injury. Prioritization is done based on causes that are in our control and the impact it has on the problem. It will be used to prioritize our solutions for prevention of needle stick injury.

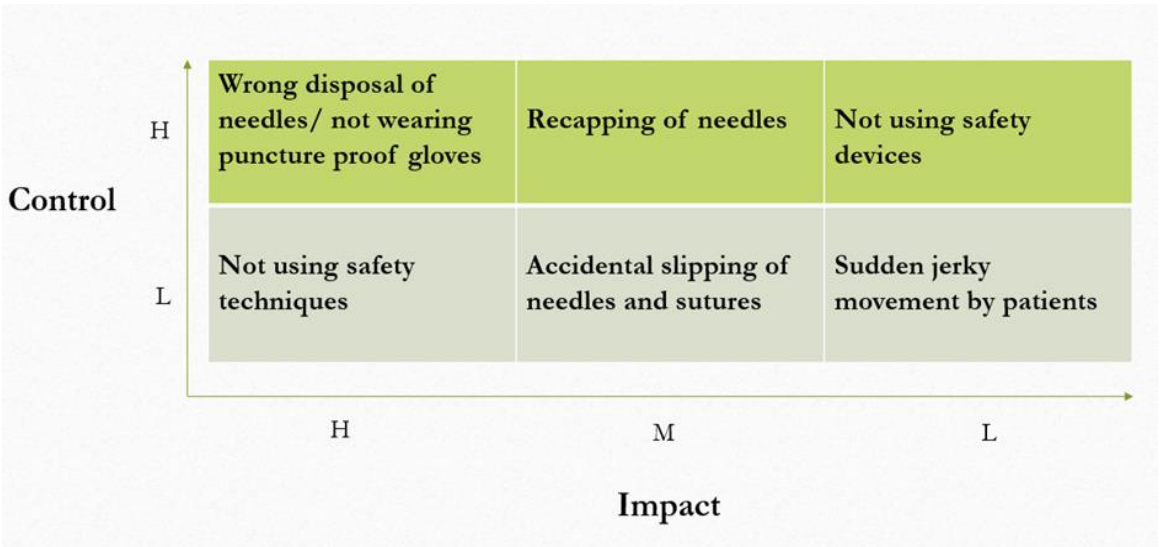



Fig – 6.1

| Problems | Recommendations |
|---|---|
| Wrong disposal of needles. | Wrong disposal has resulted in 39% of total injuries. It is important to assess knowledge and awareness of healthcare workers regarding biomedical waste disposal regularly and provide appropriate training on NSI. Opening of sharp box should be big enough for easy disposal of needles. Hub cutters should be replaced if they are not in right condition. |
| Housekeeping staff not wearing puncture proof gloves while handling waste. | Making housekeeping staff aware about blood borne diseases like HIV, HCV and hepatitis, and importance of wearing puncture proof gloves to avoid NSI. |
| Recapping of needles by doctors and nurses. | Recapping of needles have resulted in 15% of total injuries. It is important to train new joiners, nurses, and doctors on correct techniques of using needles and disposing them after use. No touch technique, use of hemostat, knife dish and one hand scoop technique for recapping. |
| Not using safety devices. | Encouraging use of safety devices like pro safety, eclipse needles, blunt fill needles and using knife dishes to keep syringes instead of holding them in hand can reduce NSI. |
| Not following safety precautions | Safe handling before using and disposal of needles after using them should be well planned. immediately dispose of used needles in correct sharps disposal containers. |
| Sudden jerky movements by patients. | All the patients should be informed before the procedure. Help of other staff should be taken wherever needed. |

Table – 6.1

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