Dissertation Report

At

ASIAN DWARKADAS JALAN SUPER SPECIALTY HOSPITAL

(01ST MARCH 2024 TO 1st JUNE 2024)

AWARENESS OF NEEDLE STICK INJURY AMONG THE HEALTHCARE WORKERS

By

Mr. Syed Saif Alam

PG/22/133

Under guidance from

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PGDM (Hospital and Health Management)

2022-2024

International Institute of Health Management Research, New Delhi

(Completion of Dissertation from respective organization)

The certificate is awarded to Mr. **Syed Saif Alam** in recognition of having successfully completed his/her Dissertation in the department of **Quality** and has successfully completed his/her Project on **AWARENESS OF NEEDLE STICK INJURY AMONG THE HEALTHCARE WORKERS** At **ASIAN DWARKADAS JALAN SUPER SPECIALTY HOSPITAL** from **01ST MARCH 2024 to 01st JUNE 2024**

He/She comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning.

We wish him/her all the best for future endeavors.

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Syed Saif Alam** student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at **ASIAN DWARKADAS JALAN SUPER SPECIALTY HOSPITAL** from **01ST MARCH 2024** to **1st JUNE 2024**.

The Candidate has successfully carried out the study designated to him during internship training and his/her approach to the study has been sincere, scientific, and analytical.

The Internship is in fulfillment of the course requirements. I wish him all success in all his/her future endeavors.

Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Mentor:

Anuradha Bhardwaj
Assistant Professor
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Certificate of Approval

The following dissertation titled **"AWARENESS OF NEEDLE STICK INJURY AMONG THE HEALTHCARE WORKERS"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed, or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

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Name	Signature
Dr. MUKESH RAVI RAUSHAN	Raushan
Dr. SHIVAM KAPOOR	
Aneradha	Anuradh

Certificate from Dissertation Advisory Committee

This is to certify that **Mr. Syed Saif Alam,** a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. He/ She is submitting this dissertation titled **"AWARENESS OF NEEDLE STICK INJURY AMONG THE HEALTHCARE WORKERS"** at **"ASIAN DWARKADAS JALAN SUPER SPECIALTY HOSPITAL"** in partial fulfillment of the requirements for the award of the **PGDM (Hospital & Health Management).**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report, or book.

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FEEDBACK FORM

Name of the Student: Syed Saif Alam

Name of the Organization: Asian Dwarkadas Jalan Super Specialty Hospital

Area of Dissertation: Quality Department (AWARENESS OF NEEDLE STICK INJURY)

Attendance: Perfect adherence as per the norms

Objectives achieved: Understood the details of the concept, theoretical underpinning, guideline & study implementation.

Deliverables: As per dissertation guidelines

Strengths: Good Communication skill, Sincerity, proactiveness, composure, hardworking, learning spree

Suggestions for Improvement: Work-life balance, Time management, Self-reflection.

Suggestions for Institute (course curriculum, industry interaction, placement, alumni):
Please provide more time and support to the students for the completion of the project.

Signature of the Officer-in-Charge/ Organization Mentor (Dissertation)

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Date: 03/06/2024
Place: Dhanbad

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **"AWARENESS OF NEEDLE STICK INJURY AMONG THE HEALTHCARE WORKERS"** and submitted by **Mr. Syed Saif Alam** Enrollment No. **PG/22/133** under the supervision of **Anuradha Bhardwaj** for award of PGDM (Hospital & Health Management) of the Institute carried out during the period from **01ST MARCH 2024** to **1st JUNE 2024** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Syed Saif Alam

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The ability to help and patience to exercise diligence and provide support is a quality admonished by very few. Any job in this world, however trivial or tough cannot be accomplished without the assistance of the others. I would hereby take the opportunity to express my indebtedness to people who have helped me to accomplish this task. The present line of accomplishment is not a formality but an honest word of appreciation that has exactly been felt during my training.

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With due respect and regards

Syed Saif Alam

ABSTRACT

Needle adhere wounds (NSIs) speak to a major word related danger for healthcare laborers (HCWs), possibly uncovering them to genuine bloodborne pathogens such as HIV, hepatitis B, and hepatitis C. The objective of this ponder is to assess the level of mindfulness, information, and preventive hones with respect to NSIs among HCWs in a tertiary care healing center setting. A cross-sectional overview was conducted including 200 HCWs, counting specialists, medical caretakers, and research facility technicians. Data were collected employing a organized survey that tended to participants' information of NSIs, the recurrence and circumstances of NSI episodes, detailing hones, and adherence to security conventions and preventive measures. The discoveries show a tall level of common mindfulness approximately the dangers related with NSIs, with 90% of the respondents recognizing the potential perils. Be that as it may, there's a discernible disparity between mindfulness and hone, as it were 65% of the members reliably followed to set up security conventions. Strikingly, 45% of the respondents detailed having experienced at slightest one NSI amid their careers. Despite this tall rate, as it were 70% of those who experienced an NSI detailed the occurrence to the pertinent specialists, underscoring a noteworthy hole in compliance with announcing methods. Encourage examination uncovered a few obstructions to successful NSI administration, counting insufficient preparing, need of mindfulness almost appropriate announcing channels, and deficiently get to security gadgets. The ponder too recognized particular regions where advancements are essential, such as improving the accessibility and utilize of safety-engineered gadgets, providing regular and comprehensive preparing sessions on NSI avoidance, and cultivating a culture that prioritizes word related wellbeing and security. In conclusion, whereas there's a significant level of mindfulness with respect to the dangers of NSIs among HCWs, there is a basic got to bridge the crevice between information and hone. This will be accomplished by executing normal instructive intercessions, making strides get to security gadgets, and implementing strict adherence to security rules. By addressing these ranges, healthcare teach can altogether decrease the frequency of needle adhere wounds, in this manner guaranteeing a more secure working environment for healthcare experts and minimizing the chance of transmission of bloodborne contaminations.

TABLE OF CONTENTS

ABBREVIATIONS

BBV - Blood borne virus

HBV – Hepatitis B Virus

HCV – Hepatitis C Virus

HIV – Human Immunodeficiency Virus

HIC – Hospital infection control

NSI – Needle stick Injury

PEP - Post – exposure Prophylaxis

HCW- Health Care Workers

BMW- Biomedical waste management

Executive summary

Injuries where there is a risk of transmission of infection frequently occur in emergency department, occupational health departments and primary care settings. BBV infections such as HBV, HCV and HIV are of particular concern because of the potential long-term health effects for people who become infected, and the increase in their prevalence in the population in recent decades.

Needle stick injuries (NSIs) are one of the most important occupational injuries for healthcare workers and providers. This concern is most evident in professions which handle “sharps” on a routine basis. A "needle stick" means a break in the skin from a needle or any other "sharp" such as a scalpel.

The study was carried out to determine the occurrence of NSI among various categories of health care workers (HCWs), and the causal factors, the circumstances under which these occur and to, explore the possibilities of measures to prevent these through improvements in knowledge, attitude, and practice in ASIAN DWARKADAS JALAN SUPER SPECIALTY HOSPITAL.

A cross-sectional study was conducted among the nurses, lab & blood bank technicians, housekeeping staffs, and the doctors of ASIAN DWARKADAS JALAN SUPER SPECIALTY HOSPITAL via self-administered questionnaire. The data thus obtained was interpreted and recommendations were made for the reduction in the NSI.

INTRODUCTION

Introduction of the organization

ASIAN DWARKADAS JALAN SUPER SPECIALTY HOSPITAL, a 350 bedded, multispecialty hospital, located in Dhanbad in a 5-acre area, has been rendering its service for the community for last decades.

The hospital has started its quality journey way back to 2016. Within a short span of time ASIAN has achieved the highest gold standard in healthcare.

Accreditations and Certifications:

1. Comprehensive NABH (Hospital and Blood Bank)
2. ISO 9001:2008, ISO 27001, ISO Platinum

The hospital has a total of twelve committees which help it to deliver compassionate care and trustworthy service to all.

Infection Control Committee

Chairperson – Medical Administrator

Members- Hospital Infection Control Sister

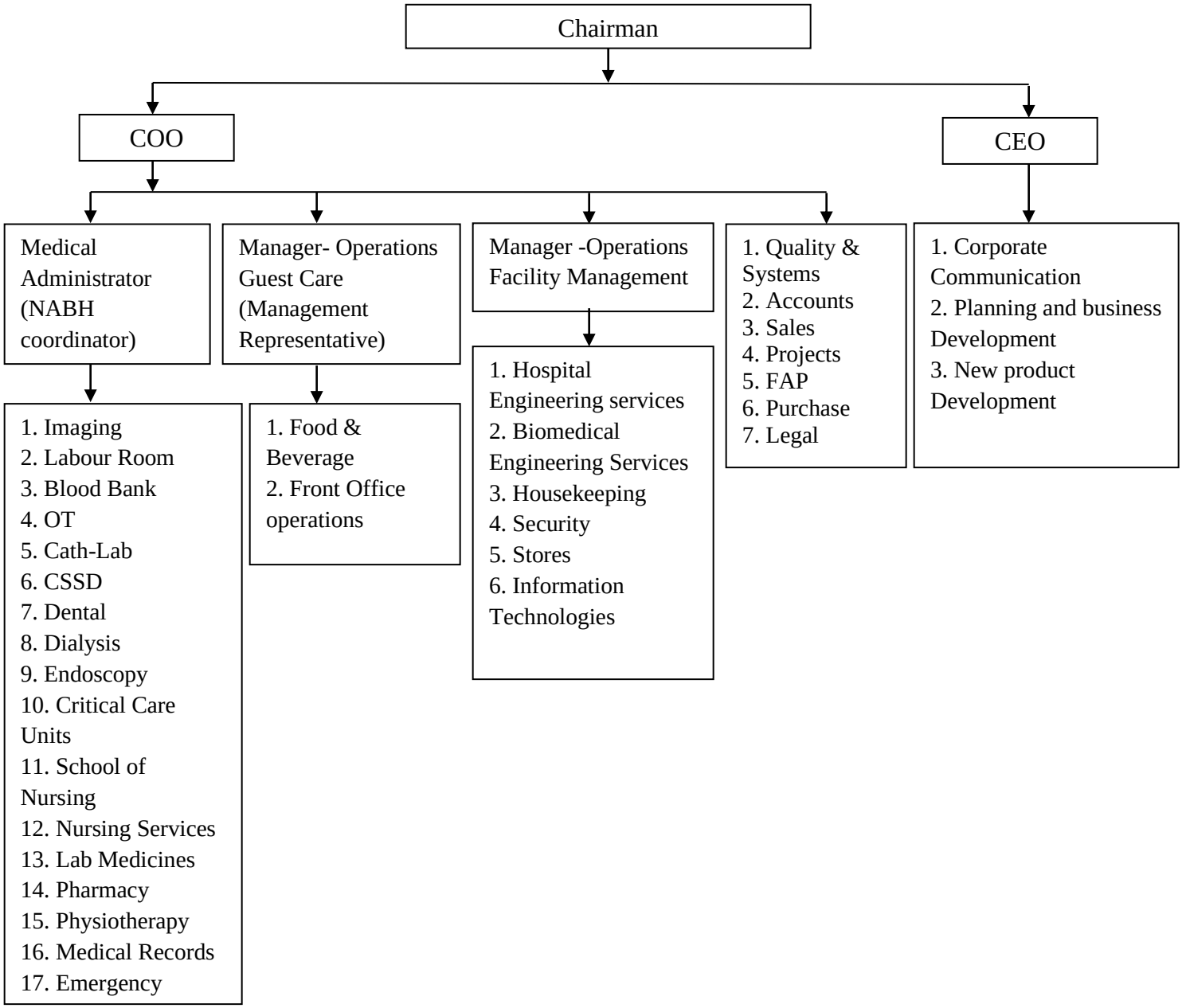
Emergency Medical Officer

DNS

Microbiologist Head

5 other doctors

Organogram of the Hospital



Introduction of project:

A needle stick injury is a percutaneous piercing wound typically set by a needle point, but possibly also by other sharp instruments or objects. It is commonly encountered by people handling needles and sharps in the medical setting, such injuries are an occupational hazard in the medical community. Percutaneous injuries caused by needle sticks, pose a significant risk of occupational transmission of blood borne pathogens. Their incidence is considerably higher than current estimates, and hence a low injury rate should not be interpreted as a nonexistent problem. Needle stick injuries constitute a major hazard for the transmission of viral diseases such as Hepatitis B, Hepatitis C, and Human Immunodeficiency Virus (HIV). Needle stick injuries (NSI) are wounds caused by sharps such as hypodermic needles, blood collection needles, IV cannulas or needles used to connect parts of IV delivery systems. The causes include various factors like type and design of needle, recapping activity, handling/transferring specimens, collision between HCWs or sharps, during clean-up, manipulating needles in patient line related work, passing/handling devices, or failure to dispose of the needle in puncture proof containers. Because of the environment in which they work, many HCWs from physicians, surgeons, and nurses to housekeeping personnel, laboratory technicians and waste handlers are at an increased risk of accidental needle stick and sharps injuries. As a result, these workers are prone to occupational acquisition of various blood borne pathogens, including the microorganisms causing HIV/AIDS, hepatitis B and C, malaria, infectious mononucleosis, diphtheria, herpes, tuberculosis, brucellosis, spotted fever, and syphilis.

The risk of transmission of from patient to the healthcare worker is as follows: Hepatitis C (3%), Hepatitis B (30%), and HIV (0.3%), which depends on the viral load of the patient. At least 20 different pathogens are known to have been transmitted by needle stick injuries Needle stick injury is a significant problem in general practice and exposes general practitioners and practice nurses to a serious risk of infection from blood-borne transmissible agents. All patients should be considered to pose a potentially high risk of infection; also, recommended precautionary measures should be always followed. An effective and multifaceted management plan must be prepared for prevention and management of needle stick injuries in healthcare workers. After an occupational exposure, the healthcare worker should be counseled about the degree of risk associated with the type of exposure: needle stick injuries pose a greater risk than splashes, and those from a hollow-bore needle are a greater risk than from a solid needle.

We know that needle stick injuries are contributing to the overall burden of health care worker injuries. Although we do not know exactly how many work-related needle sticks occur each year across the country, estimates indicate that 600,000 to 800,000 such injuries occur annually, about half of which go unreported. At an average hospital, workers incur approximately 30 reported needle stick injuries per 100 beds per year. Most reported needle stick injuries involve nursing staff; but laboratory staff, physicians, housekeepers, and other health care workers are also injured. Health care workers outside the hospital setting are also at risk. Others at clinics, private medical and dental offices, nursing homes, correctional facilities, and in the community, such as emergency medical response workers, are also at risk of exposure to contaminated blood.

Fortunately, most needle stick injuries do not result in exposure to an infectious disease, and of those that do, the majority do not result in the transmission of infection. Nevertheless, needle stick injuries may expose workers to bloodborne pathogens such as human immunodeficiency virus (HIV), hepatitis B virus, and/or hepatitis C virus. A health care worker's risk of infection depends on several factors, such as the pathogen involved, the severity of the needle stick injury, and the availability and use of pre-exposure vaccination and post-exposure prophylaxis (i.e., protective treatment for the prevention of disease once exposure has occurred).

HIV

HIV infection is a complex disease that can be associated with many symptoms. The virus attacks part of the body's immune system, eventually leading to severe infections and other complications—a condition known as AIDS. Despite current therapies that delay the progression of HIV disease, many individuals who become infected with HIV are likely to develop AIDS.

Most involved nurses and laboratory technicians. Percutaneous injury–such as needle sticks–was associated with 89% of the documented occupationally acquired infections. Studies that followed health care workers with occupational HIV exposures indicate that the risk of transmission from a single percutaneous exposure, such as a needle stick or a cut with a sharp object, to HIV-infected blood is approximately 0.3%. To say this another way, three of every 1,000 health care workers stuck with a needle contaminated with HIV-positive blood will become infected with HIV.

An epidemiologic study of health care workers who had percutaneous exposures to HIV found that the risk of HIV transmission was increased in certain circumstances: when the worker was exposed to a larger quantity of blood from the patient, a procedure that involved placing a needle in a patient's vein or artery, a deep injury, or when the patient was in a phase of the illness associated with higher viral levels.

Hepatitis B Virus

Hepatitis B virus (HBV) infection is another risk associated with needle stick injuries. About one-third to one-half of persons with acute HBV infection develop symptoms of hepatitis such as jaundice, fever, nausea, and abdominal pain. Most acute infections resolve, but 2% to 6% of patients develop chronic infection with HBV that carries an estimated 15% lifetime risk of dying from cirrhosis of the liver or from liver cancer.

Most health care workers are immune to HBV due to pre-exposure vaccination. However, studies done before the availability of hepatitis B vaccine showed rates of HBV transmission ranging from 6% to 30% after a single needle stick exposure to an HBV-infected patient.

Hepatitis C Virus

Health care workers with needle stick injuries are also at risk for infection with the Hepatitis C virus (HCV). The precise number of health care workers who have acquired HCV occupationally is not known. However, epidemiologic studies of health care workers exposed to HCV through a needle stick or other percutaneous injury have found that the incidence of infection averages 1.8% per injury. Of the total new HCV infections that have occurred annually 2% to 4% have been in health care workers exposed to blood in the workplace.

HCV infection often occurs with no symptoms or only mild symptoms. But unlike HBV, with only 2% to 6% of adults developing chronic infection, with HCV chronic infection develops in 75% to 85% of patients. Seventy percent of those with chronic HCV develop active liver disease, with 10% to 20% of patients then developing cirrhosis and 1% to 5% developing liver cancer over a period of 20 to 30 years.

Post-Exposure Treatments

Postexposure prophylaxis is available for hepatitis B and HIV exposures but not for hepatitis C. However, preventing the needle stick injury in the first place is the best approach to preventing these diseases in health care workers, and it is an important part of any bloodborne pathogen prevention program in the workplace.

Emotional Impact

Another serious effect of needle stick injuries is the emotional toll on health care workers. With each needle stick incident, workers face the possibility of having been exposed to a bloodborne pathogen, in which case they face difficult decisions about undergoing medical treatment with both short-term and long-term side effects. In addition, the worker is advised to use barrier contraception and to postpone decisions on childbearing.

Studies have shown that the emotional impact of a needle stick injury can be severe and long lasting, even when a serious infection is not transmitted. This impact is particularly severe when the injury involves exposure to HIV. In one study of 20 health care workers with an HIV exposure, 11 reported acute severe distress, 7 had persistent moderate distress, and 6 quit their jobs because of the exposure. Other stress reactions requiring counseling have also been reported. Not knowing the infection status of the source patient can accentuate the health care worker's stress. In addition to the exposed health care worker, colleagues and family members may suffer emotionally.

Estimates indicate that 600,000 to 800,000 needle stick injures occur each year. Unfortunately, about half of these injuries are not reported. The incidence of NSI is considerably higher than current estimates, due to gross under-reporting (often less than 50%). In USA 6,00,000 to 10,00,000 receive NSI from conventional needles and sharps every year, while in UK it is 1,00,000 HCWs/year4. In India, authentic data on NSI are scarce. It is known that around 3-6 billion injections are given per year, of which 2/3rd injections are unsafe (62.9%) and the use of glass syringe is constantly associated with higher degree of unsafety.

The financial impact of NSI includes both direct and indirect costs6-8. The average percutaneous transmission rates for hepatitis B (HBV) and C (HCV) are 33.3 (6-33%) and 3.3 per cent (1-

10%), respectively, while the seroconversion risk for HIV is 0.31 per cent9. Although HBV exposures pose the highest risk for infection, it has an effective vaccine and post exposure prophylaxis (PEP) for HCWs which can dramatically reduce the risk. This is not so for HCV and HIV. Therefore, prevention is the only recourse for these.

Preventing NSI is an essential part of any blood borne pathogen prevention program in the workplace. Every healthcare facility should have an infection control program in place through a working hospital infection control committee.

In ASIAN hospital the staffs who experience NSI must fill up a Performa and an Infection control committee is formed who looks on the NSI cases and document the incidences and take the needful actions.

The present study addresses the important issue of NSI and aims at determining the occurrence of NSI among different categories of HCWs, the various factors responsible, the circumstances under which these occur and explores the availability and possibilities of measures to prevent these through improvement in knowledge, attitude, and practice. The study also aims at assessing the awareness levels among various categories of HCWs, on issues like NSI policy, segregation of sharps at source and the use and availability of safety devices to prevent NSI.

Objective:

- To assess the knowledge and awareness for needle stick injury among nursing staffs, doctors, lab technicians and housekeeping staffs of ASIAN Hospital, located in a Dhanbad.
- The various factors responsible for NSI & the circumstances under which these occur.
- To compare the incidence rate among these groups.
- To bench mark the department with the least incidence of needle stick injury.

Methodology:

A cross- sectional study was conducted by the means of self-formulated Questionnaire among 217 healthcare professionals of ASIAN Hospital, a 350 bedded hospital in Dhanbad during March 2024 to May 2024. The questionnaire formulated contained both quantitative and qualitative type questions with sections for demographic items, the type of devices that caused NSI, how injury occurred and whether the injury was reported to management. The staffs working in the hospital were asked about their experience of NSI from April 2023 to April 2024 (12-month recall period). In this study, needle stick injury was defined as percutaneous injury caused by hollow-borne needles, suturing needles, scalpel blades and lancets. Questionnaires were distributed and collected anonymously one-month period.

Cases of needle stick were the number of personnel who have had at least one experience of NSI. The incidence of cases was the number of cases to the number of nurses who answered the questionnaire.

Correlation is used as OR tool for showing a Positive relationship between the experience and awareness of NSI.

Duration of the study: 3 Months

Location: ASIAN DWARKADAS JALAN SUPER SPECIALTY HOSPITAL, Dhanbad

Statistical tool used- Co relation.

When dealing with two sets of variables measured on the same unit, it may so happen that one variable may be in a way related to the other. That is to say that with the change in one variable from one value to the other, the other variable will also change in its value corresponding to the change in the first variable. Then it is assumed that there is a correlation between the two variables. This correlation may be either due to some direct relationship between the two variables or due to some inherent factor common to both the variables. The quantum of this correlation is measured in terms of Correlation Coefficient. This measure takes into consideration the co-variation between the two variables in relation to the variation within the two variables.

- The correlation coefficient can be either positive or negative depending upon the co-variance between the two variables.
- The correlation coefficient is zero when there is no co-variation between the two variables.
- When the relationship is perfect, the correlation coefficient will be either +1 or –1.
- Therefore, the range of correlation coefficient is from – 1 to +1.

In this study, the correlation of experience and awareness of staff is shown; it may be observed that the awareness increases with the increase in the experience. It is possible to measure the degree of relationship between the awareness and experience of the HCWs in terms of a correlation coefficient.

Work Experience	% of staff (x)	% of awareness (y)
0-1.9	26.60	41.60
2-5.9	48.94	69.78
6-10.9	14.89	85
11-15.9	4.26	88
16- 31	5.32	100

Hypothesis (H0) – Awareness is positively correlated with experience.

n = no of staffs = 188

x = % of staff under each experience group

y = % of awareness in each group

Work Experience	**X**	**Y**	**x2**	**y2**	**xy**
0-1.9	26.6	41.6	707.56	1730.56	1106.56
2-5.9	48.93	69.78	2394.145	4869.2484	3414.335
6-10.9	14.89	85	221.7121	7225	1265.65
11-15.9	4.26	88	18.1476	7744	374.88
16- 31	5.32	100	28.3024	10000	532
∑	**100**	**384.38**	**3369.867**	**31568.8084**	**6693.425**

$\sum x = 100$

$\sum y = 384.38$

$\Sigma x^2 = 3369.867$

$\Sigma y^2 = 31568.8084$

$(\sum x)^2 = 10000$

$(\sum y)^2 = 147748$

$\sum xy = 6693.425$

$(\Sigma x)^2/n = 53.1915$

$(\Sigma y)^2/n = 785.8936$

$(\Sigma x \Sigma y / n) = 100*384.38/188 = 204.4574$

$[\Sigma (xy) – (\Sigma x_1 \Sigma y / n)] = 6693.43- 204.4574 = 6,488.9676$

$(\Sigma x^2 – (\Sigma x)^2 /n) = 3369.867 – 53.1915 = 3316.6755$

$(\Sigma y^2 – (\Sigma y)^2 /n) = 31568.8084 – 785.8936 = 30782.9148$

$$r = \frac{[\Sigma x y - (\Sigma x \Sigma y / n)]}{\sqrt{[\{(\Sigma x^2 - (\Sigma x)^2/n)\}\{(\Sigma y^2 - (\Sigma y)^2/n)\}]}}$$

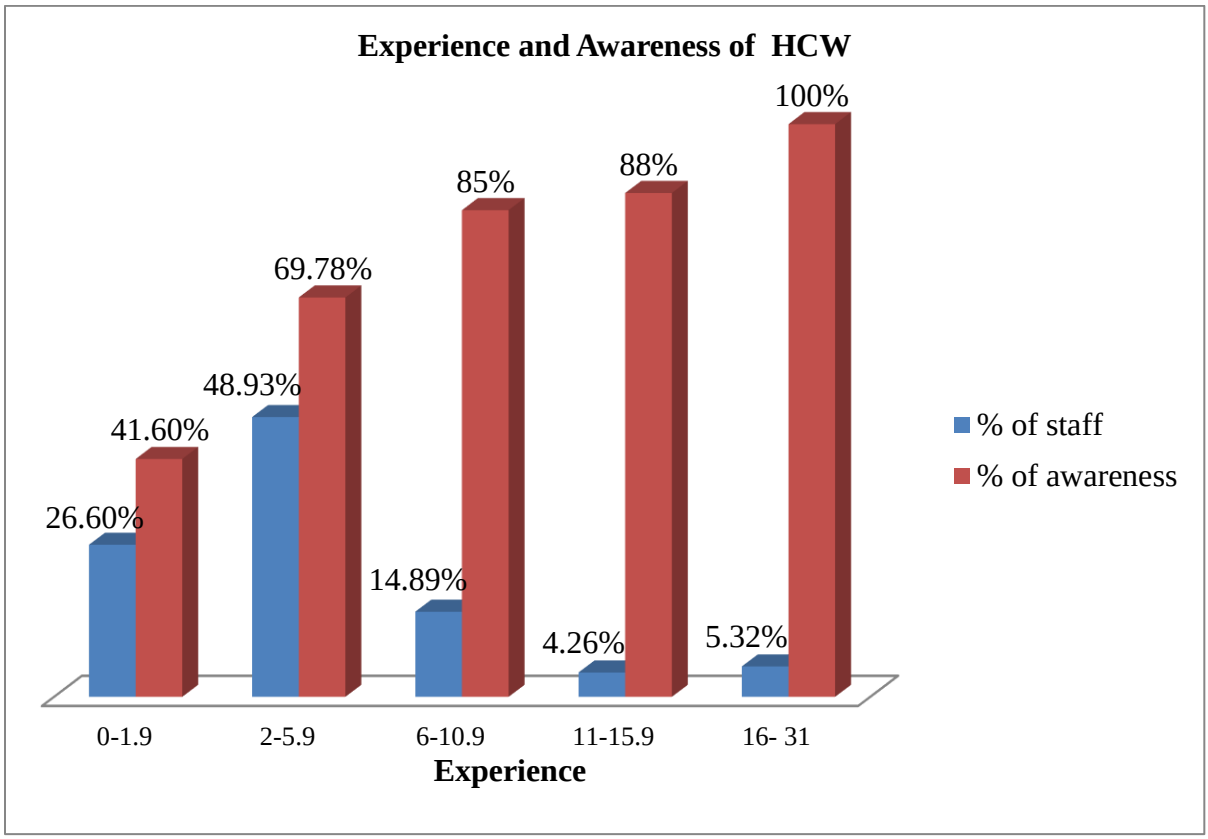
$$r = \frac{6693.425 - 204.457}{\sqrt{(3316.675)(30782.914)}}$$

$$r = \frac{6488.968}{10104.302}$$

r = 0.642

Since the value of 'r' obtained is positive and less than 1 the hypothesis is accepted which shows that there is a positive significant correlation between the experience and awareness of NSI.

Graph 1: Experience and Awareness of HCW

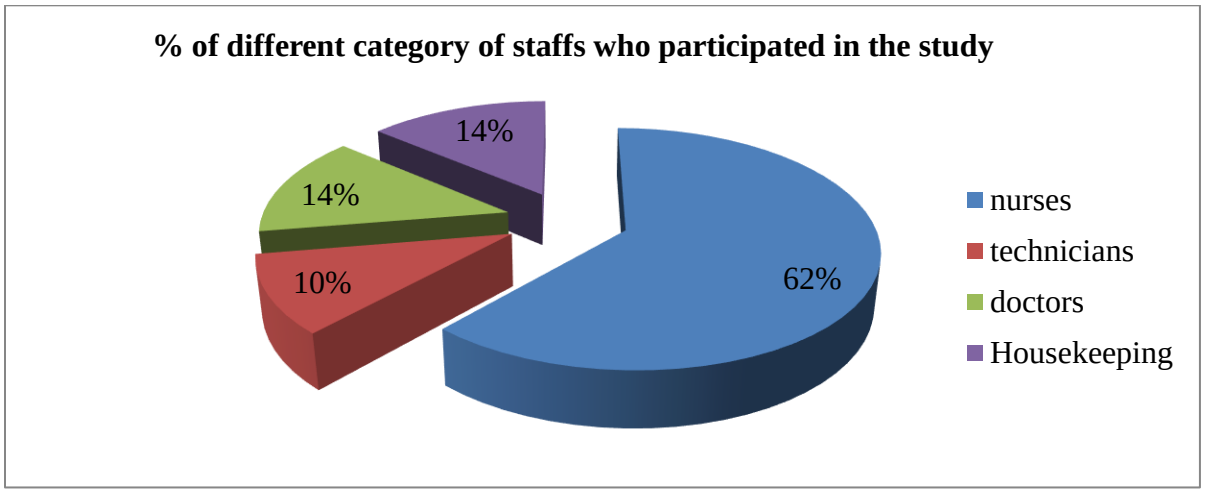


The graph represents that 26.60% of total staffs had experience of 0 to 1.9 years and were 41.60% aware about the NSI. Similarly, 48.93% of total staffs had experience of 2 to 5.9 years and were 48.93% aware about the NSI and so on. We can observe that with the increase in experience the awareness of NSI is also increasing.

General Findings

A total of 188 HCWs participated in the study, including consultants 10 (5.3%) resident doctors 16 (8.51%), staff nurse 116 (61.70%) technicians 20 (10.64%) and housekeeping staff 26 (13.82%). A total of 188 questionnaires out of 217 questionnaires were returned which gave a response rate of 86.6%.

Graph 2: **% of different category of staffs who participated in the study.**



Male: Female ratio was 4:5 with mean age of 29.05±7.07. The majority of nursing staff were female (77% - 44 out of 58) and their mean age was 27.31(SD= 5.18) years old. The difference in the mean ages of both sexes was statistically significant ($P< 0.05$). The mean experience of HCWs was 4.6 years.

Table 1: Demographic profile of the respondents

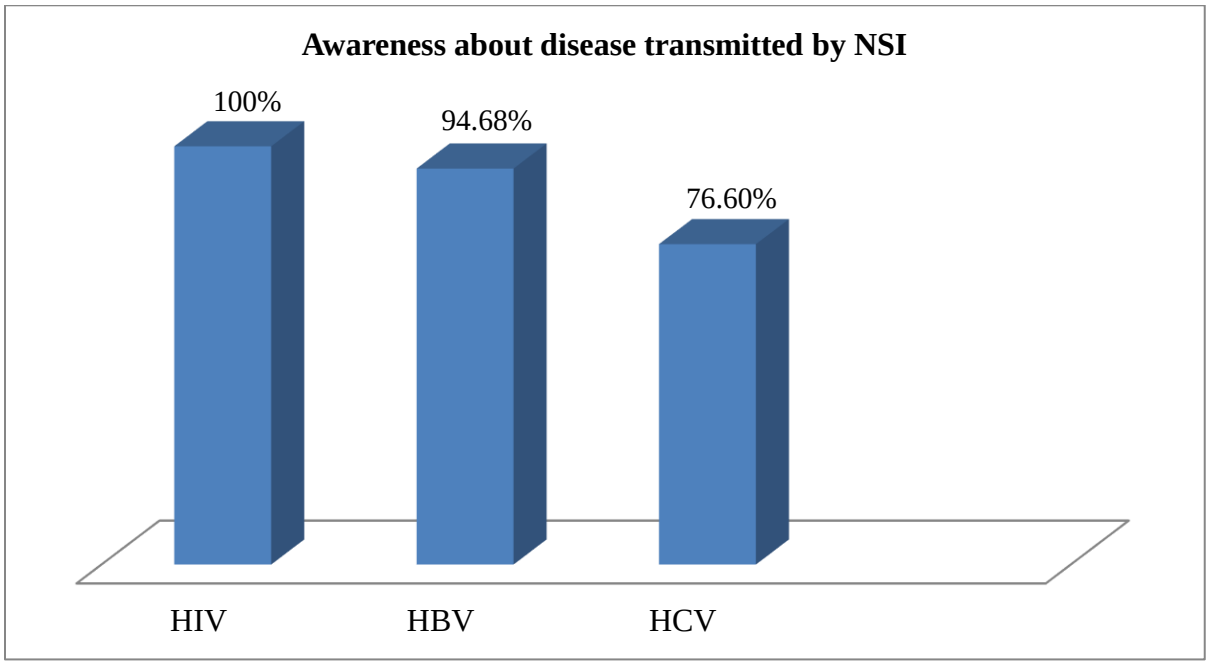
S.No.	Variables	Frequency	Percent
1	**Gender**		
	Male	42	44.68
	Female	52	55.32
2	**Age**		
	<=25	39	41.49
	>25	55	58.51
3	**Work Experience**		
	<=5 yrs.	72	76.60
	>5 yrs.	22	23.40

Table 2: Knowledge about NSI and its consequences.

Variables	No.	%
Aware of NSI	168	89.3617
NSI is a Concern	172	91.48936
Awareness about consequences of NSI	168	89.3617

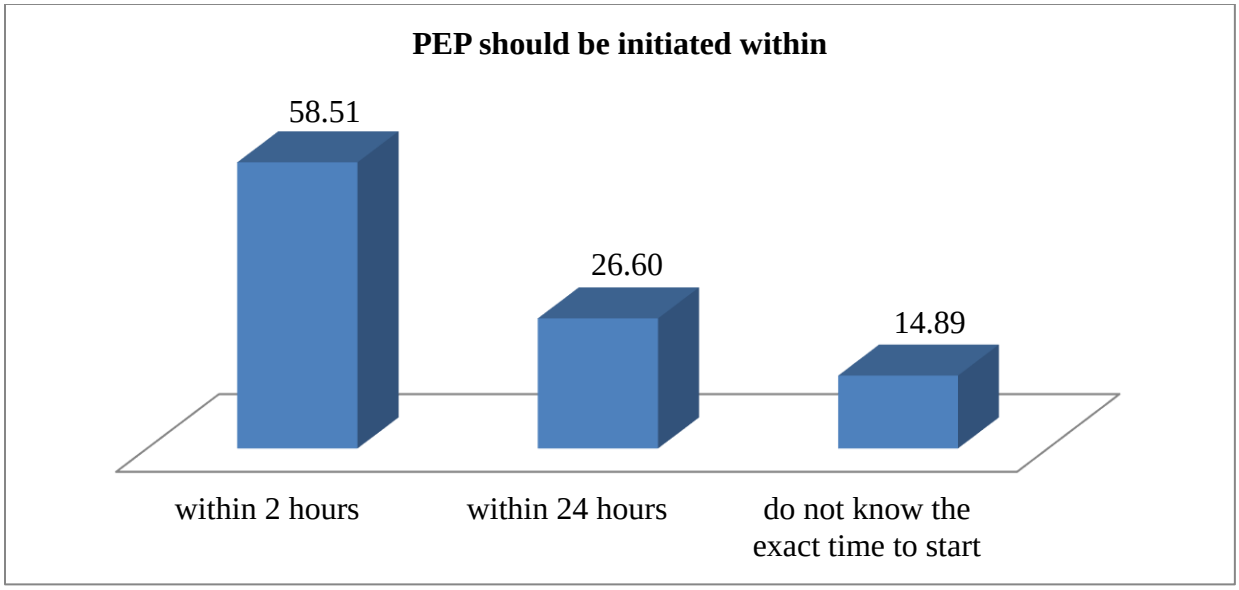
89% of the respondents responded that they are aware of NSI and are aware of the consequences of NSI. 91% believed that NSI is a concern.

Graph 3: Awareness about disease transmitted by NSI.



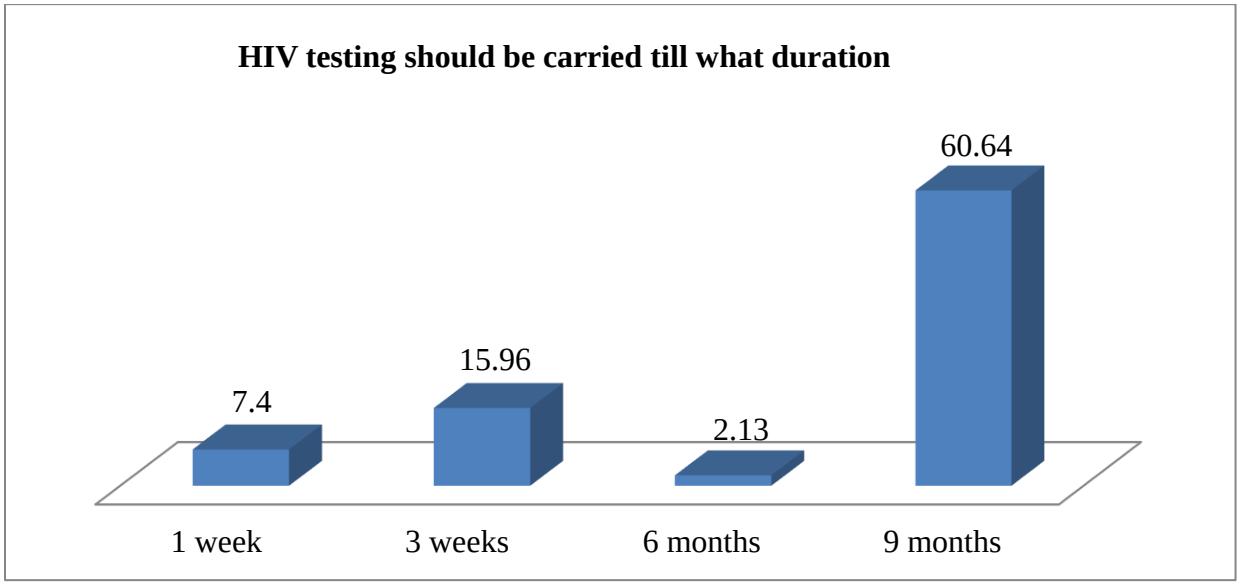
The responses showed that 100% of people were aware that NSI causes HIV94.6% knew about HBV and 76.6% knew that HCV is caused by NSI.

Graph 4: PEP should be initiated within.



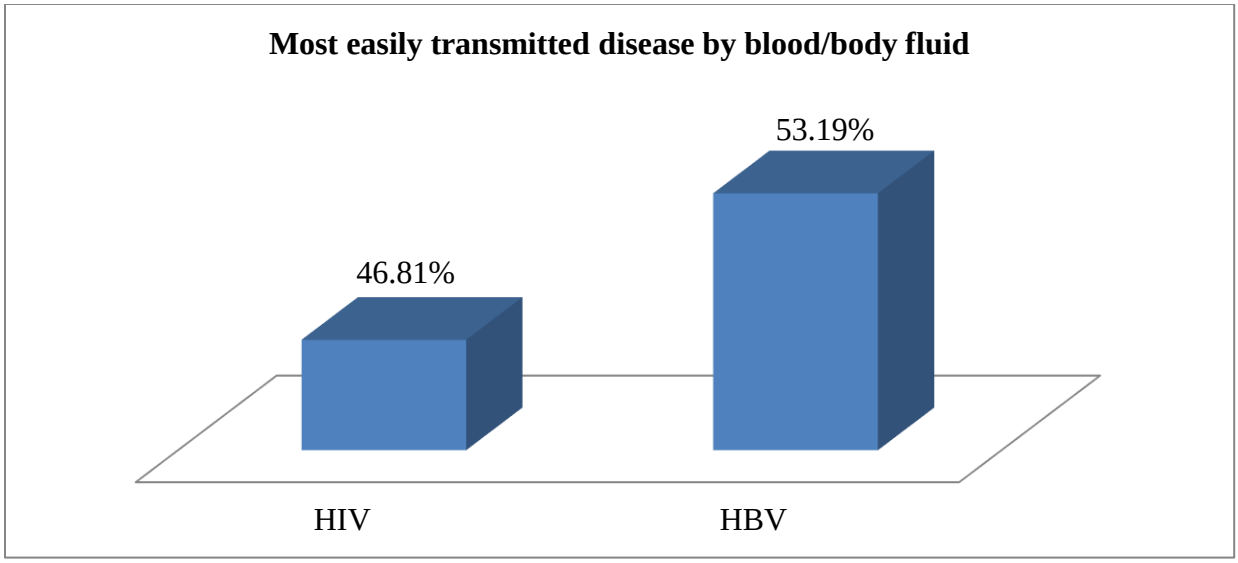
58.51% respondents had the correct knowledge about the time within which PEP should be initiated i.e. they responded that it should be initiated within 2 hours.

Graph 5: HIV testing should be carried till what duration.



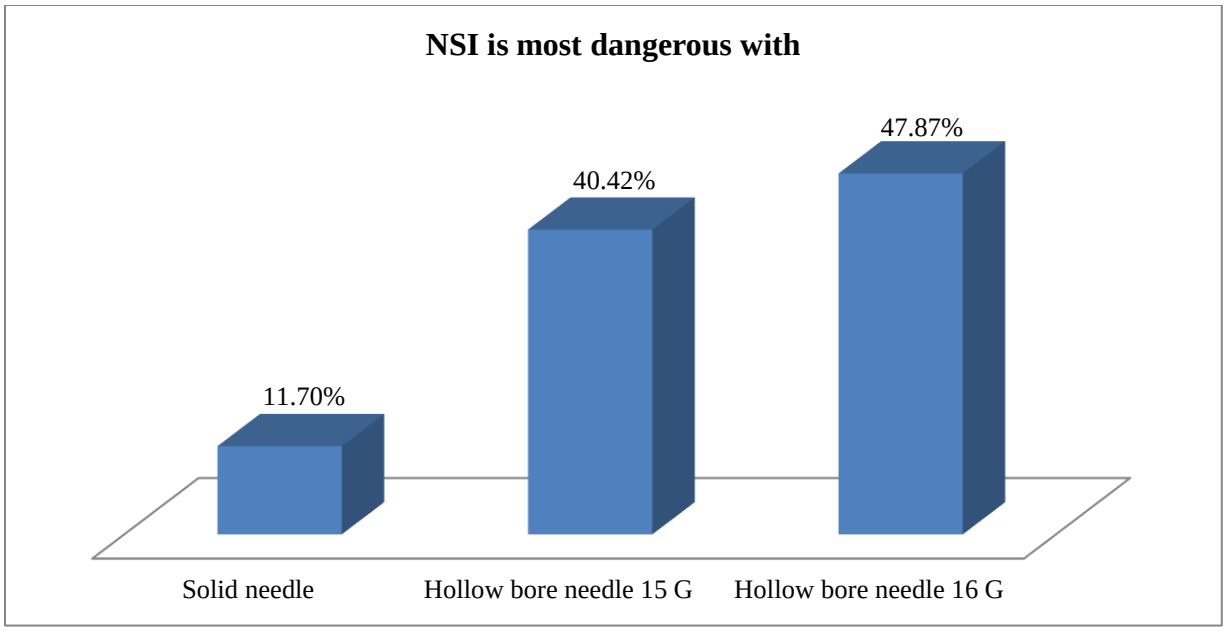
60.64% responded that HIV testing should be carried out till 9 months after an NSI.

Graph 6: Most easily transmitted disease by blood/body fluid.



53.19% of respondents responded that HBV can be most easily transmitted by very small amount of blood or body fluid.

Graph 7: NSI is most dangerous with which type of needle.



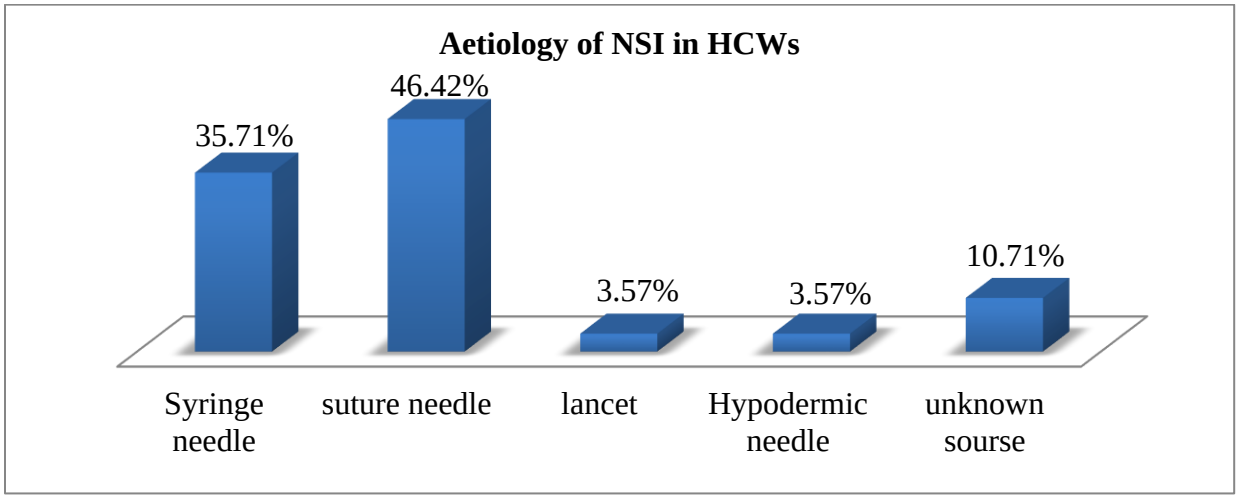
47.87% of respondents responded that NSI is most dangerous with Hollow bore needle 16 G.

Table 3: General Process followed by respondents in the hospital.

S.No.	Variables	Frequency (positive responses)	%
1	Practice BMW	164	87.234
2	Know colour code for sharp waste	172	91.489
3	Disinfect sharp before disposal	2	1.0638
4	Use needle cutter	0	0
5	Use gloves for phlebotomy	92	48.936
6	Vaccinated against HBV	174	92.553
7	Experienced NSI during past 12 months	56	29.787
8	Awareness about HIV status of patient	26	13.83
9	Were wearing gloves during injury	12	6.383
10	Filled up incident report	50	26.596
11	Know universal precaution guidelines	150	79.787
12	Knowledge about needleless safety device	48	25.532

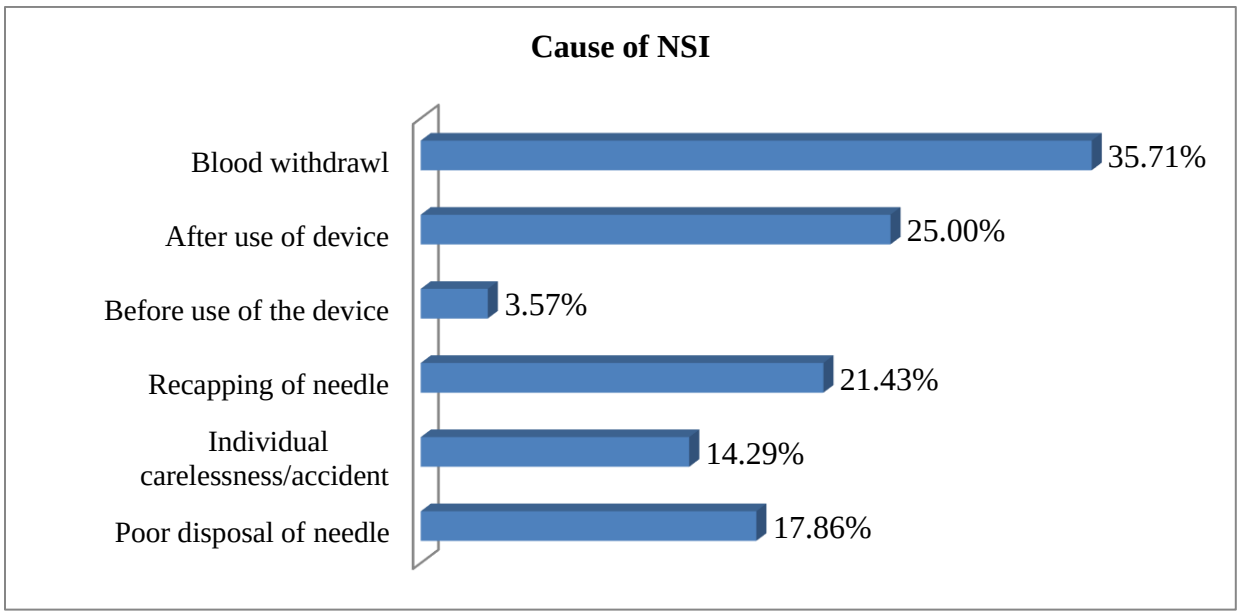
87% of the respondents practiced BMW, 91.48% knew the color code for disposal of sharp waste. Only 1.06% of respondent's disinfect sharp before disposal. The hospital does not have any hub/needle cutter. 48.93% respondents used gloves during phlebotomy. Out of the 188 respondents 56 (29%) gave a history of NSI in preceding one year. 92.55% HCWs were completely vaccinated against HBV. 6.38% of HCWs were wearing gloves at the time of NSI.

Graph 8: Aetiology of NSI in HCW Graph.



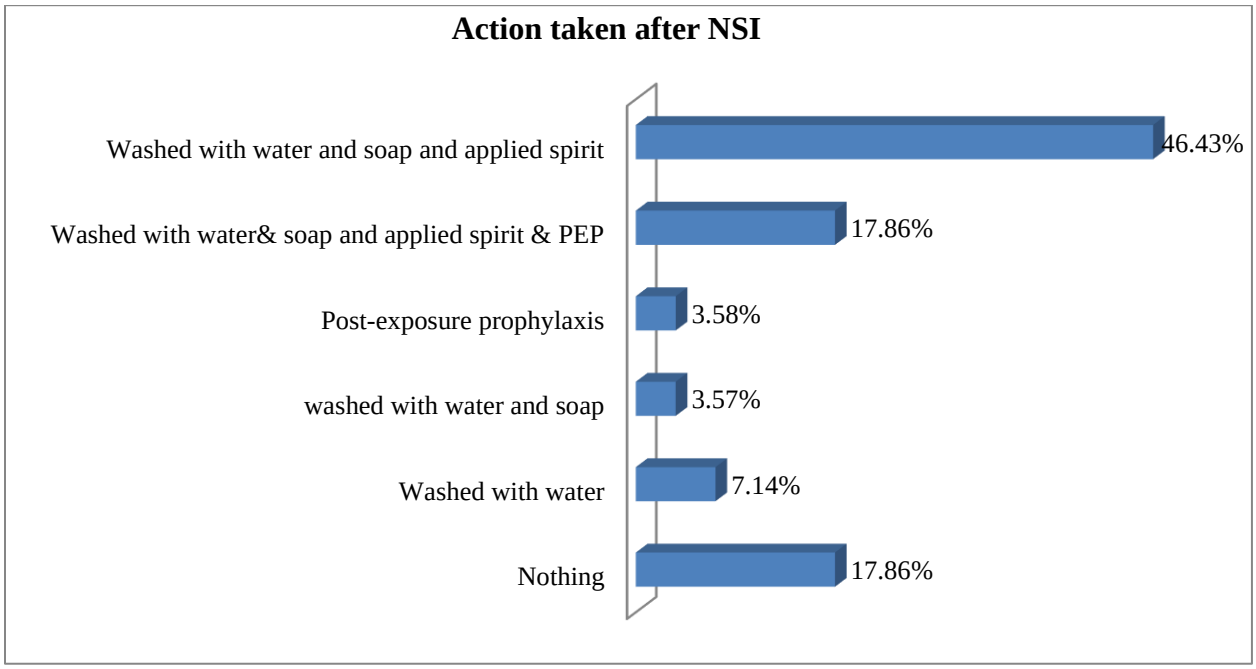
The type of needle involved was suture needle (46.42%), Syringe needle (35.71%), Lancet (3.57%), Hypodermic needle attached to disposable syringe (3.57%). 10.71% of NSI were caused by unknown source.

Graph 9: Causes of NSI in ASIAN



The most common clinical activity to cause the NSI was blood withdrawal (35.71%). Recapping needles was a common cause of NSI (21.43%). (17.86%) of NSI were caused due to poor disposal of needle followed by individual carelessness (14.29%). (25%) of NSI occurred after use of device while (3.57%) of NSI was caused before the use of device.

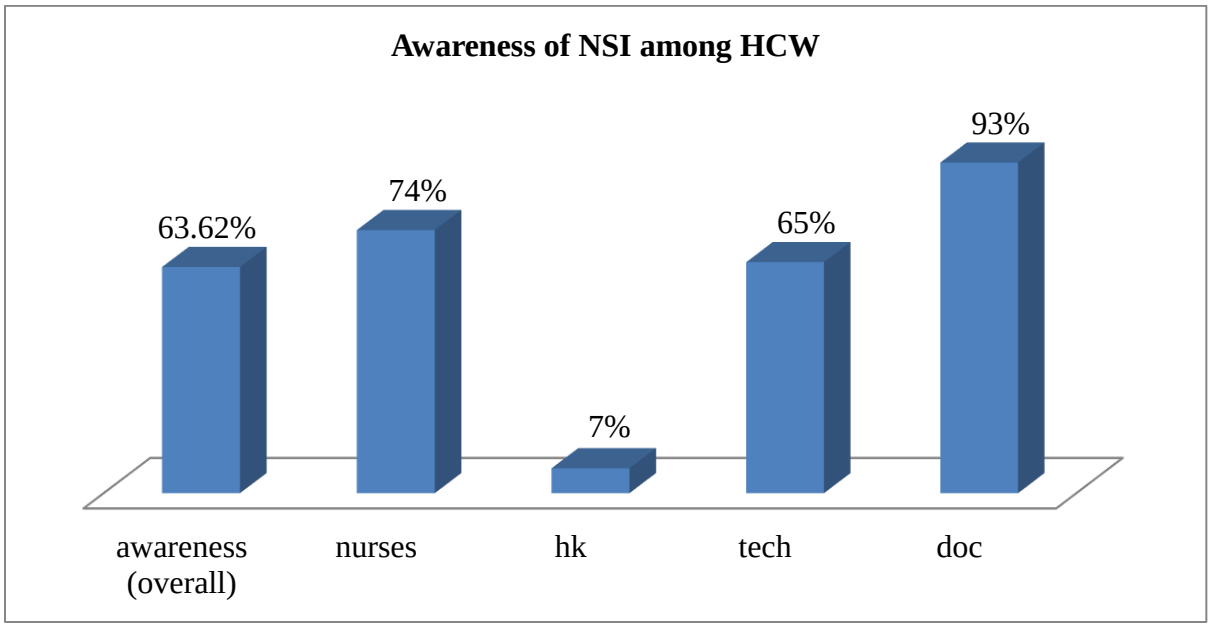
Graph 10: Action taken after NSI.



After NSI 46.43% of HCWs washed the injury with water and soap and applied spirit, 17.86% washed the injury with water and soap and applied spirit and took post-exposure prophylaxis,7.14% washed with water, 3.57% washed with water and soap,3.58% took PEP, 17.86% did nothing after the NSI.

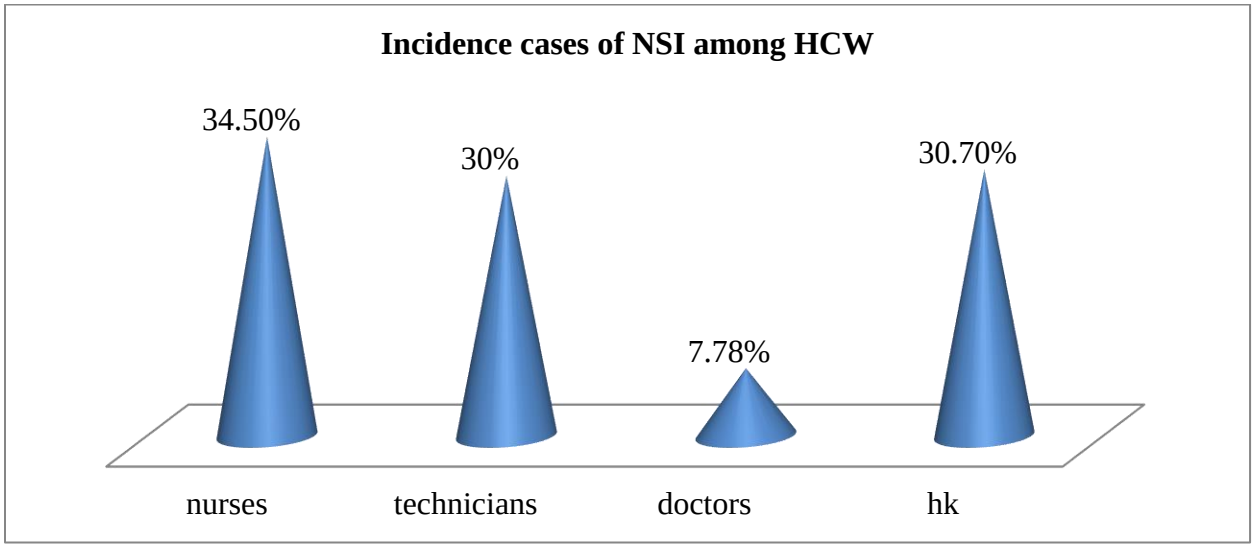
A total of 46% of HCWs were aware of the HIV status of the patient. 67.85% HCWs reported the injury to either their line manager or to the Infection Control Nurse and filled the incidence report while 32.14% did not report the case. 10.71% did not report the injury due to time constraints, 10.71% did not know the appropriate procedure after injury, 7.14% did not report as they took self-care while 3.57% HCWs believed that vaccination against HBV is sufficient.

Graph 11: Awareness of NSI among HCW.



Overall awareness about NSI among HCWs, was 63.62% with maximum awareness among the Doctors (consultants and resident doctors 93%) followed by nurses with 74%, Technicians 65% and least among the housekeeping staffs, 7%.

Graph 12: Incidence cases of NSI among HCW.



Among HCWs incidence of NSI was highest among nurses 34.50%, followed by housekeeping staffs 30.70%, technicians 30% and doctors 7.78%.

Table 4: Incidence of NSI in various departments of the hospital.

Department		NSI_in_last_year		
		No	Yes	Total
BLOOD BANK	Count	6	6	12
	% within Department	50.0%	50.0%	100.0%
HOUSEKEEPING	Count	18	8	26
	% within Department	69.2%	30.8%	100.0%
ICU	Count	26	16	42
	% within Department	61.9%	38.1%	100.0%
IPD	Count	60	16	76
	% within Department	78.9%	21.1%	100.0%
OPD	Count	8	2	10
	% within Department	80.0%	20.0%	100.0%
OT	Count	6	8	14
	% within Department	42.9%	57.1%	100.0%
PATHLAB	Count	8	0	8
	% within Department	100.0%	.0%	100.0%

Path lab showed the least cases of NSI for last 12 months so this department can be benchmarked for the least incidence of NSI. The maximum no of NSI cases were recorded in OT. The incident rates of NSI were 50% in blood bank, 38.1% in ICU, 30.8% in housekeeping department, 21% in IPD and 20% in OPD.

RECOMMENDATIONS

- Avoid recapping needles.
- Follow the universal precaution guidelines.
- Never dispose of sharps in the regular Trash.
- Report all needle stick and sharps-related injuries.
- NSI should be included in the HIC module of the hospital and training to all staffs should be given once every month.

Discussions

While the science base on needle stick injuries continues to grow, completed research indicates that such injuries are an important and continuing cause of exposure to serious and sometimes fatal infections among health care workers. Greater collaborative efforts by all stakeholders are needed to prevent needle stick injuries and the consequences that can result. Such efforts are best accomplished through a comprehensive program that addresses institutional, behavioral, and device-related factors that contribute to the occurrence of needle stick injuries in health care workers. Critical to this effort is the elimination of needle use where safe and effective alternatives are available and the continuing development, evaluation, and use of needle devices with safety features. All such approaches must include serious initial and ongoing training efforts. Monitoring systems are also needed to provide accurate information on the magnitude of needle stick injuries and trends over time, potential risk factors, emerging new problems, and the effectiveness of interventions in all health care settings.

Approximately 100000 needle stick injuries currently occur each year in the UK (Godfrey) and in Scotland an estimated 2000-2400 such injuries were sustained annually (Short Life Working Group). More recently, a review of eight studies evaluating more than 7000 health-care workers found that 4% sustained a needle stick injury per year (range 1-6.2%) (Trim and Elliott). In the USA, the number of needle stick injuries was estimated to be one million per year (Occupational Health and Safety Administration, Porta et al). However, the actual number of needle stick injuries remains unknown due to under-reporting.

Since the mid-1980s surveillance systems have collated information regarding numbers of occupational exposures to hepatitis B, hepatitis C and HIV, use of post-exposure prophylactic treatments and any seroconversions. In the UK the Health Protection Agency (formerly the Public Health Laboratory Service, part of the CDSC) started its national strategy in 1984. This surveillance system relies on voluntary reports from health-care establishments of health-care worker exposures to hepatitis B, hepatitis C and HIV, exposures where the source-patient status was unknown or where the recipient was treated with post-exposure prophylaxis. For exposures to hepatitis C and HIV, recipients are followed up six weeks and six months after the initial report. Approximately 250 departments report to the CDSC (Thomas). This information can be accessed via their website (www.hpa.org.uk).

Other surveillance strategies have provided data regarding needle stick injuries. In June 2000, the RCN started a sharps injury surveillance pilot study using Exposure Prevention Information Network (EPINet) software. This system provides health-care facilities with a standardized method for recording all inoculation injuries as well as provision of statistical analysis, customized reports and tracking of injuries by job, device, and procedure (May and Brewer, 2016).

Health care workers use many types of needles and other sharp devices to provide patient care. Whenever one of these "sharps" is exposed in the work environment there is an opportunity for injury. Data from two surveillance programs, the CDC National Surveillance System for Healthcare Personnel (NaSH) and EPINet, a project developed by Dr. Janine Jagger at the University of Virginia, provide descriptive epidemiological evidence of how such injuries occur, including under what circumstances, with what devices and during what types of procedures. The picture that emerges reflects a continuum of risk opportunities throughout the life cycle of sharp device use involving interactions among patients, workers, devices, and the environment. Approximately 38% of percutaneous injuries occur during use, when a needle or other sharp being manipulated in a patient becomes accidentally dislodged. Other injuries occur after use during cleanup, or in association with the disposal of a sharp device.
The circumstances leading to a needle stick injury depend partly on the type and design of the device used. In addition to risks related to device characteristics, needle stick injuries have been related to certain work practices such as recapping, transferring a body fluid between containers, and failing to properly dispose of used needles in puncture-resistant "sharps" containers.

Although medical safety devices are key in the prevention of needle stick injuries, as already mentioned, they are most effective when used in the context of a comprehensive safety program that considers all aspects of the work environment and that has employee involvement and management commitment. Several studies document substantial reductions in needle stick injuries with the proper use of needleless systems or newer safety needle devices used in a comprehensive program to prevent needle stick injuries.

The critical role of appropriate training has been emphasized by several recent reports of increased patient bloodstream infections associated with improper care of needleless IV systems, primarily in the home health care setting. These data emphasize the need for patient safety

surveillance and thorough training as well as occupational injury surveillance when implementing the use of a new medical device.

Another recently published study, funded by CDC, examined needle stick injuries in an acute-care community hospital in Greater Washington, D.C. The study found that implementation of a multi-faceted intervention program led to a significant and sustained decrease in the overall rate of sharps injuries. Annual sharps injury incidence rates decreased from 82 sharps injuries/1,000 full-time workers to 24 sharps injuries/1,000 full-time workers, representing a 70% decline in incidence rate overall. The hospital's interventions included an intensive training effort, expanded employee health programs, and an expedited injury reporting process with a focus on confidentiality issues, an anti-needle sticks and sharps task force, and the implementation of new work practices, as well as the use of medical safety devices.

Conclusion

Needle stick injuries are a hazard for all health-care workers in the clinical arena and are a risk of potential transmission of blood-borne pathogens following an inoculation injury. Overall awareness about NSI among HCWs, was 63.62% with maximum awareness among the Doctors (consultants and resident doctors 93%) followed by nurses with 74%, Technicians 65% and least among the housekeeping staffs, 7%.

After NSI 46.43% of HCWs washed the injury with water and soap and applied spirit, 17.86% washed the injury with water and soap and applied spirit and took post-exposure prophylaxis,7.14% washed with water, 3.57% washed with water and soap,3.58% took PEP, 17.86% did nothing after the NSI.

Several studies demonstrated that health-care workers did not always report their injuries for a variety of reasons, including fear of a positive result, being unaware of the reporting process, inaccurate assessment of the source patient and complacency.

To improve the reporting of such incidents, it is essential to understand health-care workers' behavior, including reasons for not reporting incidents, and to review current reporting processes. A standardized protocol across all hospitals may reduce confusion among health-care workers who frequently move jobs and therefore must familiarize themselves with several protocols and procedures.

Preventive strategies have been implemented to reduce the risk of not only injury but transmission of blood-borne pathogens:

Hepatitis B vaccination is an effective means of reducing the risk of occupational hepatitis B transmission. However, health-care workers are not conscientious in assuring their immunity.

Training and education have been found to raise awareness and improve health-care workers' knowledge of the risks associated with needle stick injuries but, despite this, health-care workers continue to demonstrate inadequate knowledge and practical application of safe working practices. Studies should be undertaken to gain insight into information retention and reasons for non-concordance with preventive strategies.

Attendance at educational conferences should be encouraged not only for managers who are able to influence change in the clinical setting but for all clinical staff, to enable exposure to research and current care methodologies. Consequently, this may encourage health-care workers to embrace new technological developments, such as needle-protective devices.

Not all needle-protective devices have been evaluated to date for either usability and safety or efficacy in reducing needle stick injuries. The available research studies reviewing needle-protective intravenous peripheral catheters have, however, demonstrated that these products may be of some value in reducing the incidence of needle stick injuries. Needle-protective devices should be considered as a preventive strategy, but further studies are necessary to evaluate not only the usability and acceptability of these products in a variety of clinical areas, but their efficacy in reducing needle stick injuries.

It is essential for all health-care workers to support advances in technology by encouraging evaluations of these products to identify the degree to which needle-protective devices may assist in the prevention of occupational exposure to blood-borne pathogens.

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ANNEXURE

Proforma for reporting of the Exposure to Blood and Body Fluids

(To be completed by the employee exposed to blood and body fluids)

Date of Incidence	Time of Incidence
Employee Name	C.C No
Designation	Department
Work Location	

(To be completed by the EMO and sent to the Medical Administrator)

Section I. GENERAL EXPOSURE INFORMATION

1. Date of exposure
2. Time of exposure
3. Location where exposure occurred
4. Type of exposure
    a) Percutaneous
    b) Mucous Membrane
    c) Skin
    d) Bite
5. Type of fluid/tissue involved in the exposure
    a) Blood/Blood Products
    b) Amniotic Fluid
    c) Pleural Fluid
    d) Pericardial Fluid
    e) Peritoneal Fluid
    f) Synovial Fluid
    g) Semen
    h) Vaginal Secretions
    i) CSF

j) Others

6. Body site of exposure
    a) Hand/Finger
    b) Eye
    c) Arm
    d) Leg
    e) Foot
    f) Mouth
    g) Nose
    h) others

Section II: Percutaneous Injury

1. Depth of Injury
2. What needle/sharp caused the injury (Select one)
    a) Hollow bore needle
    b) Glass
    c) Solid sharp
    d) Plastic
    e) Unknown
3. What purpose was the sharp being used:
    a) Performing Phlebotomy
    b) Giving percutaneous injection
    c) Connecting/ injecting into IV line
    d) During surgery/biopsy
    e) Dental procedure
    f) Handling specimen
    g) Waste collection/cleaning

Section III: Mucous Membrane/Skin Exposure

1. Estimate the amount of blood/ body fluid exposure
    a) Small 5 cc or 1 tsp
    b) Moderate 6-50 cc or 1 tsp
    c) Large > 50 cc
2. Activity/ Event when exposure occurred
    a) Airway Manipulation
    b) Changing dressing/wound care
    c) Irrigation Procedure
    d) Tube placement/removal/manipulation
    e) Handling specimen container
    f) Vaginal delivery
    g) Others (Specify)
3. PPE used during exposure
    a) Gloves
    b) Gown
    c) Mask

Section IV: Bite

1. Wound Description
    a) No spontaneous bleeding
    b) Spontaneous bleeding
    c) Tissue avulsed
2. Activity/ event when exposure occurred
    a) During dental procedure
    b) During oral examination

Source V: Source Information

1. Source known
2. HIV Status of the source known
3. Test result on the source

Test	Positive	Negative	Indeterminate	Not tested
HIV				
HBs Ag				
Anti – HCV				

Section VI: Initial Care to the employee

HIV post exposure prophylaxis given: Yes/No/NA

Hepatitis B vaccine status ……

Anti HBs Ag titer <10 IU/ml ; >10IU/ml

HBIg given Yes/No/NA

Section VII: Follow up

1. Hepatitis B Vaccine :
2. Testing for HIV/HBsAg/Anti-HCV

HIV	HBsAg	HCV
0 weeks	0 weeks	0 weeks
3 weeks		3 weeks
6 weeks		
6 months	6 months	
9 months	9 months	9 months

Signature of EMO

Signature of HIC Officer

Signature of medical administrator

Self-administered questionnaire for the Study

Professional behavior of health care personnel regarding needle stick injury

Fill/ Tick appropriate answers.

Age Department

Gender Designation

Experience

1) Are you aware of Needle – stick injury?

   Yes No

   If yes, what is it? ……

2) Is needle-stick injury a concern?

   Yes No. Do not know

3) Are you aware of consequences of needle-stick injury?

   Yes No. Not concerned

4) Which diseases are transmitted by needle stick injury (NSI)?

   .....

   ……..

   ……..

5) Do you know the steps to be carried just after an NSI?

   Yes No

   If yes, mention the steps

   I. ……

   II. ……

   III. ……

   IV. ……

   V. ……

   .

6) Post – exposure Prophylaxis (PEP) should be initiated within

a) Within two hour
b) Within 24 hours
c) Any time can be started
d) Need not to take
e) Do not know the exact time to start

7) HIV testing by enzyme immunoassay to monitor for a possible seroconversion should be carried out for how much duration?
   a) 1 week
   b) 3 weeks
   c) 3 months
   d) 6 months
   e) 9 months
   f) Do not know

8) What is most easily transmitted by the smallest amount of blood and body fluid?
   a) HIV
   b) HBV
   c) HCV

9) NSI with which of the following is most dangerous?
   a) Solid needle
   b) Hollow bore needle 15 G
   c) Hollow bore needle 16 G
   d) Hollow bore needle 21 G

10) Do you practice proper waste segregation at the point of origin?
   Yes No

11) Do you know the colour code for the Sharp waste to be disposed?
   Yes No

If yes what? …….

12) Do you disinfect sharps before disposal?

Yes No

13) What is the method of ultimate disposal for used sharps/needles

……

14) Do you use needle cutter/ Hub cutter?

Yes No

15) Do you use gloves for phlebotomy procedures?

Yes No Do not bother

16) Have you been fully inoculated against Completed HBV vaccination?

Yes No Do not remember

17) Have you sustained a needle-stick injury during the last 12 months?

Yes No Do not remember

If yes, how many injuries? ……

18) By what did the NSI happen?

a) Syringe needle (pre-filled, disposable)
b) Suture needle
c) Winged, butterfly needle
d) Intravenous catheter stylet
e) Lancet (for skin prick)
f) Needle holder or vacuum tube
g) Hypodermic needle attached to disposable syringe
h) Unknown source

19) How did the most recent incident happen?

a) Poor disposal of needle

b) Individual carelessness/accident
c) Recapping of needle
d) Inappropriate disposal of used device (container too full, wrong type)
e) Before use of the device
f) Other (specify) ……

20) Were you aware about the HIV status of that patient?

Yes No

21) Were you wearing gloves at the time of injury?

Yes No

22) What did you do after the NSI?

a) Nothing
b) Washed with water
c) Washed with water and soap
d) Post-exposure prophylaxis
e) Washed with water and applied spirit
f) Washed with water and soap and applied spirit
g) Washed with water and soap and applied spirit and post-exposure prophylaxis
h) Any other, please specify

23) Did you report the injury?

Yes No

If yes, to whom

a) Line manager
b) Infection control
c) Nobody
d) Any other please specify …….

If no why,

a) Fear of punitive response by employer
b) Use of self-care
c) Time constraints
d) Belief that they are at low risk of infection
e) Belief that their HBV vaccination status is sufficient
f) Lack of knowledge of appropriate procedures after injury
g) Any other, please specify ……

24) Did you fill in an incident report?

Yes No Not concerned

25) Do you know about Universal Precaution Guidelines?

Yes No

26) When will you take Universal precaution?

a) When patient is very sick
b) When patient s known to be HIV positive
c) When patient is infected with chicken pox
d) All patients irrespective of their tests

27) Do you know about needleless safety devices?

Yes No

If yes, name any one ……

28) Do you believe that standard precautions practices protect against blood borne infections?"

Yes No

Thank you for your valuable time and suggestion.

syed S Alam D

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