

## ORIGINAL ARTICLE

**Awareness and practices regarding needle stick injuries among nurses in a tertiary care hospital of Delhi**Priyanka<sup>1</sup>, Anita Shankar Acharya<sup>2</sup>, Jyoti Khandekar<sup>3</sup>, Amit Sharma<sup>1</sup>Senior Resident, <sup>2,3</sup>Professor, Department of Community Medicine, Lady Hardinge Medical College & Associated Hospitals, New Delhi-110001, India, <sup>4</sup>GDMO, MCD, East Delhi, India

<a href="#">Abstract</a>	<a href="#">Introduction</a>	<a href="#">Methodology</a>	<a href="#">Results</a>	<a href="#">Conclusion</a>	<a href="#">References</a>	<a href="#">Citation</a>	<a href="#">Tables / Figures</a>
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**Abstract**

**Introduction:** Needle stick injuries are an important occupational hazard for nursing personnel as they form an important mechanism for transmission of blood borne pathogens. Hence the knowledge of nurses about the prevention and management of needle stick injuries and practicing standard precautions is critical. **Methodology:** This was a hospital based cross sectional study conducted among nursing staff during the month of December, 2011. A semi structured questionnaire was administered to 320 nurses working in a tertiary care hospital of New Delhi by adopting systematic random sampling methodology. Data was entered and analysed using SPSS version 12. Percentages of categorical variables were computed. **Results:** Only 31.1% nurses had adequate knowledge about steps for prevention of needle stick injuries. 259(88.4%) nurses had adequate knowledge about the authority to whom they should report needle stick injuries while almost three fourth i.e. 73.4% had adequate knowledge about management of needle stick injuries. Majority of nurses (69.6%) reported the use of gloves very often before venipuncture, 80.2% never recapped needles while 77.5% disposed sharps in puncture proof containers very often. Only one fourth (24.6%) nurses always used personal protective equipment in case of emergencies. 85.7% of nurses had received all three doses of hepatitis B vaccine. 51(17.4%) had a history of needle stick injury in the last one year out of which 49(96.1%) took adequate measures immediately after the injury and 37 (72.5%) reported the incidence to the concerned authority. **Conclusion:** The knowledge and practices of nurses regarding prevention and management of needle stick injuries were found to be unsatisfactory

**Key Words**

Awareness; Practices; Needle Stick Injuries; Nurses

**Introduction**

Healthcare workers (HCWs) are exposed to blood-borne infections by pathogens, such as HIV, and hepatitis B and C viruses, as they perform their clinical activities in the hospital. Needle stick injuries form an important occupational health hazard for them. National Institute for Occupational Safety and Health (NIOSH), USA defines needle stick injuries as injuries caused by needles such as hypodermic needles, blood collection needles, intravenous

stylets and needles used to connect parts of IV delivery systems. The activities associated with majority of needle stick injuries are administering injections, withdrawing blood, recapping needles, disposing off needles and handling trash [1].

These occupational infections can be prevented and their prevention is important because they are the most efficient mechanism of transmission of blood borne pathogens [2]. Centre for Disease Control and Prevention has also recommended steps for

prevention and measures to be taken after getting needle stick or sharp injuries [3].

Nursing personnel form an important risk group for occupational exposure to needle stick injuries as they are directly involved in the patient care activities like giving injections, starting IV line, taking blood sample etc. Hence the knowledge of nurses about the prevention and management of needle stick injuries and practicing standard precautions is critical. Not many studies are done on this aspect with focus on nurses in this part of our country. Keeping these points in mind, we planned and conducted this study to address this important issue in healthcare settings.

### Aims & Objectives

1. To assess the level of awareness regarding needle stick injuries among nurses in a tertiary care hospital of Delhi.
2. To study the practices followed by them regarding needle stick injuries.

### Material and Methods

This was a hospital based cross sectional study conducted among nursing staff during the month of December, 2011. A semi structured questionnaire was administered to 320 nurses working in a tertiary care government hospital of New Delhi by adopting systematic random sampling methodology. Institutional ethical clearance was obtained from the tertiary care hospital and informed written consent was taken from each participant.

Sample size was calculated by using Epi –Info version 7 software. There were a total of 986 nursing staff on rolls at the time of the study in the tertiary care hospital. Taking the estimated prevalence of awareness regarding prevention and management of needle stick injuries as 50 percent, confidence level of 95 percent and power of 95 percent, sample size was worked out as 275. Taking an additional 10 percent for possible non response, the minimum sample size was increased to 303.

The questionnaire was pre-tested on a random sample of nurses who were not a part of the study area for practicality and interpretation of responses and was modified accordingly. Modified questionnaire was administered to 320 nurses working in the hospital. One of the investigators was present at the time of administration and completion of questionnaire to make sure that the respondents do not discuss with each other and get influenced to answer the questions. Information was

collected on their age, current designation and years of experience, their awareness regarding steps for prevention and management of needle stick injuries, their source of information and practices regarding needle stick injuries.

Statistical analysis: Data was entered and analysed using SPSS version 12. Percentages of categorical variables were computed.

### Results

Out of 320 nurses to whom the questionnaire was administered, 293 completed it with a response rate of 91.56 percent. Thus the sample was adequately representative of the population.

The mean age of the participants was 38 years with SD of 9.3 and range of 23 to 60 years. Most of the nurses were married (81.9%) while 18.1% were unmarried. Majority of them (90.4%) had completed their General Nursing and Midwifery (GNM) training and 9.3% were graduates (BSc Nursing) [Table 1].

[Table 2] shows that only 31.1% nurses had adequate knowledge about steps for prevention of needle stick injuries. The knowledge was considered adequate if they could enumerate at least two most important steps for prevention of NSI i.e. needle should not be recapped and needle should not be touched or bent. Two hundred and fifty nine (88.4%) nurses had adequate knowledge about the authority to whom they should report needle stick injuries while almost three fourths i.e. 73.4% had adequate knowledge about management of needle stick injuries. Knowledge regarding management of needle stick injuries was considered adequate if they knew that the wound should be washed immediately with soap water and the injury should be reported promptly for initiation of post exposure prophylaxis. No significant association was found between level of education of nurses and their knowledge regarding prevention and management of needle stick injuries ( $p > 0.05$ ).

The practices of nurses regarding prevention of needle stick injuries were assessed. Majority of nurses (69.6%) reported the use of gloves before venipuncture very often, almost one fourth (23.2%) reported using it often while only one nurse reported that she never used gloves before venipunctures. A majority (80.2%) never recapped needles while 3.8% and 6.8% did it often and very often respectively. Almost three fourth nurses (77.5%) disposed sharps in puncture proof containers very often and 1% never did so. Only one fourth (24.6%) nurses never avoided personal protective equipment, a large

proportion (41%) sometimes did it while 18.8% and 10.2% avoided the use of personal protective equipment very often in case of emergencies [Table 3]. No significant association was found between level of education of nurses and practices regarding needle stick injuries. ( $p>0.05$ )

The most common source of information regarding prevention and management of needle stick injuries was refresher trainings (38.6%) followed by Government guidelines (24.9%), curriculum (23.5%) and senior colleagues (18.4%). Doctors as a source of information were quoted by only 8.9% and mass media by only 3.8% [Table 4].

As far as immunization against hepatitis is concerned, majority (85.7%) of nurses had received all three doses of hepatitis B vaccine, 4.1% had not completed the full course of three doses while 10.2% had not received even a single dose of vaccine.

Out of 293 nurses, 51(17.4%) had a history of needle stick injury in the last one year. Out of these 51 nurses, 49(96.1%) took adequate measures immediately after the injury and 37(72.5%) reported the incidence to the concerned authority. Measures were considered adequate if they washed the wound with soap and water immediately after the injury and did not squeeze or suck the injury site. Out of 37 nurses who reported the incident, 28(75.7%) were prescribed prophylactic treatment but only 22(78.6%) completed the treatment. The reasons for not completing the treatment were cited as negative serology report of patient in 4(66.6%) and side effects of drugs in 2(33.3%).

## Discussion

The results of this study have shown that the overall occupational risk awareness of nurses working in a tertiary care hospital of Delhi was not satisfactory. Less than one third nurses had adequate knowledge about the steps for prevention of needle stick injuries. Never recapping the needle and never trying to touch or bend needle after use are most important steps for prevention of needle stick injuries and only a small proportion of nurses were aware of these. The level of awareness found in our study is lower than that reported by certain other studies. A study in Saudi Arabia reported that 71% of health care workers were aware that needle should not be recapped or bent after use while 83% of respondents were aware about the same in another study conducted on medical interns in Kolkata [4,5]. In another study on dental students at Raichur [6],

22% participants mentioned that needles should be recapped after use. Hence there should be more emphasis on creating awareness regarding prevention of needle stick injuries which is found to be significantly low in our study settings.

11.6% nurses did not know the correct authority to whom they should report in case they get a needle stick injury and therefore their chances of reporting an injury is out of question. This would further result in negligence about the injury leading to high occupational risk of getting infected.

About three fourth nurses had adequate knowledge about management of needle stick injuries i.e. they knew that the wound should be washed immediately with soap water and the injury should be reported promptly for initiation of post exposure prophylaxis. Lack of this knowledge by one fourth respondents is a matter of concern as they are dealing with patients who may be suffering from life-threatening infections. Other studies have also reported the lack of awareness about prevention and management of NSI's among staff nurses [7].

The practices of nurses regarding needle stick injuries were also found to be unsatisfactory. Although majority of nurses (69.6%) reported the use of gloves before venipuncture very often, almost one third did not use the gloves regularly. One nurse reported that she never used gloves before venipuncture. In a study among nurses in Plovdiv, 86.7% used gloves [8].

A majority (80.2%) never recapped needles while 3.8% and 6.8% did it often and very often respectively which is very dangerous. Almost three fourth nurses (77.5%) disposed sharps in puncture proof containers very often and 1% never did so. As far as use of personal protective equipment during emergencies is concerned, almost three fourth nurses were not using it regularly which is of major concern as they are exposing themselves to blood borne pathogens.

Refresher trainings of nurses were the most common source of information regarding prevention and management of needle stick injuries in 38.6% of cases. Government guidelines and nursing curriculum were also cited as important sources. Other authors have also reported that curriculum is an important source of information about needle stick injuries [7].

At the time of our study, about 90% nurses were vaccinated against hepatitis B which is an encouraging finding though it is expected that all of

them to be vaccinated against Hepatitis B. This proportion is almost same as reported by a study in Malaysia [9] and it is quite higher than that reported by another study done in Nigeria (52%) [10]. A study from Delhi has found 55.4% vaccination coverage against hepatitis B among health care workers [11]. Unvaccinated individuals are at greater risk of acquiring hepatitis B infection via percutaneous injuries and nurses are at much more risk as their chances of coming in contact with infected cases are more. Although 10% unvaccinated proportion may not appear so large, but this cannot be ignored in high risk groups like nurses all of whom should be vaccinated against hepatitis B.

Out of 293 nurses, 51(17.4%) had a history of needle stick injury in the past one year. This is a quite large proportion reporting NSI which can be prevented by observing certain precautionary measures. This incidence is slightly higher than that found in a study in Malaysia [9] (14.1%) while there are other studies which have revealed a varied incidence of needle stick injuries from 37% to 100% [7,10,12-14].

Out of 51 nurses with history of needle stick injury, 49(96.1%) took adequate measures immediately after the injury and 37(72.5%) reported the incidence to the concerned authority. Measures were considered adequate if they washed the wound with soap and water immediately after the injury and did not squeeze or suck the injury site. Out of 37 nurses who reported the incident, 28(75.7%) were prescribed prophylactic treatment but only 22(78.6%) completed the treatment. The reasons for not completing the treatment were cited as negative serology report of patient in 4(66.6%) and side effects of drugs in 2(33.3%). Only a proportion of nurses with history of needle stick injury had reported the incidence and still smaller proportions took treatment and then completed treatment. Thus, there is a casual attitude among nurses regarding management of NSI's which can have very serious consequences. This should be taken into consideration by hospital authorities to educate nurses regarding this and to introduce measures to follow up at least those nurses who had reported the incidence for completion of treatment.

Our findings are similar to another study conducted in Delhi where 74% health care workers washed the wound with soap and water and reported the incident to concerned authority [13] while a study done in Ludhiana shows that 23.7% never reported the incident [15]. Our findings are much better as

compared to other studies which show only 26% to 30% reporting of needle stick injuries [7, 16, 17, 18]. Another study which was done in a tertiary care hospital of Delhi reveals that only 39.4% health care workers washed the wound with soap and water and 14.8% took no action at all after the injury [18].

### Conclusion

The study has revealed inadequate knowledge and practices regarding prevention and management of needle stick injuries among nurses. Hence there is a need for more emphasis on creating awareness on these issues.

### Recommendation

Constant re-enforcement is recommended by refresher trainings and repeated circulation of guidelines to reduce the rate of needle stick injuries as well as for their adequate management. The results of the study were intimated to the hospital authorities and they were recommended to take this issue with special concern. They were advised to formulate strategies not just to create awareness but also to increase the adherence of nurses to standard precautions.

### Limitation of the study

The major limitation of our study is the use of self-administered questionnaire for assessing the awareness and practices of nurses. The practices found in the study results were self-reported by the respondents and not directly observed. Constant re-enforcement is recommended by refresher trainings and repeated circulation of guidelines to reduce the rate of needle stick injuries as well as for their adequate management.

### Relevance of the study

The most common occupational hazard faced by nursing personnel is NSI. Hence adequate and correct knowledge about the prevention and management of NSI is of paramount importance. This study has highlighted the gaps in knowledge and practices of nurses in a tertiary care hospital of Delhi. The findings of this study will help the administrators to formulate guidelines for appropriate interventions for prevention of NSIs.

### Authors Contribution

Priyanka was involved in conception, analysis, manuscript writing and final approval of the manuscript. ASA was involved planning, design, analysis and interpretation, critical revision and final

approval of the manuscript. JK was involved conception, design, analysis and interpretation, critical revision and final approval of the manuscript. AS was involved in data collection, analysis and interpretation and final approval of the manuscript.

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**Tables****TABLE 1 BASELINE CHARACTERISTICS OF THE RESPONDENTS (N=293)**

Variables	Number (%)
<b>Age (years)</b>	
23-32	98(33.4)
33-42	109(37.2)
43-52	68(23.3)
53-60	18(6.1)
<b>Marital Status</b>	
Married	240 (81.9)
Unmarried	53 (18.1)
<b>Education</b>	
GNM	265 (90.4)
BSc	27 (9.3)
MSc	1 (0.3)
<b>Experience (years)</b>	
1-10	115 (39.3)
11-20	115 (39.3)
21-30	53 (18.0)
31-40	10 (3.4)

**TABLE 2 KNOWLEDGE REGARDING NEEDLE STICK INJURIES (N=293)**

Adequate knowledge	Number (%)
Steps for prevention of needle stick injuries	91(31.1)
Correct authority for reporting needle stick injuries	259(88.4)
Management of needle stick injuries	215(73.4)

**TABLE 3 PRACTICES OF NURSES REGARDING PREVENTION OF NEEDLE STICK INJURIES. (N= 293)**

Practices	Never No (%)	Seldom No (%)	Sometimes No (%)	Often No (%)	Very often No (%)
Wearing gloves before venipuncture	1(0.3%)	5(1.7%)	15(5.1%)	68(23.2%)	204(69.6)
Recapping needles	235(80.2%)	6(2%)	21(7.2%)	11(3.8%)	20(6.8)
Disposing sharps in puncture proof containers	3(1.0%)	7(2.4%)	9(3.1%)	47(16%)	227(77.5)
Avoid personal protective equipment in case of emergencies	72(24.6%)	16(5.5%)	120(41%)	55(18.8%)	30(10.2)

**TABLE 4 SOURCE OF INFORMATION REGARDING PREVENTION OF NEEDLE STICK INJURIES (N=293)**

Source of information	Number (%)
Refresher training	113(38.6)
Govt. guidelines	73(24.9)
Curriculum	69(23.5)
Senior colleagues	54(18.4)
Doctors	26(8.9)
Mass media	11(3.8)