AN EXPLORATORY STUDY ON INCIDENCE OF NEEDLE STICK INJURY AND ITS CONTRIBUTING FACTORS AMONG NURSES WORKING IN SELECTED HOSPITALS AT HOSHIARPUR

Sanjay Kumar Kulchania[1]
Lecturer, Department of Nursing, Mother Mary's Institute of Nursing , Nasrala, Hoshiarpur, Punjab 146022, INDIA
Manju Chawla[2]
Principal, Mother Mary's Institute of Nursing , Nasrala, Hoshiarpur, Punjab 146022, INDIA

ABSTRACT

Needle stick injuries continue to be common in the medical field, and needle stick safety is an important subject that must be addressed. Scant attention is paid to occupational health safety for nurses in Indian hospital in the context of blood-bome infection. The public tends to believe that patients are cured solely due to the efforts of doctors. The doctors may be the team leader, but it is the nurses who physically care for patients. Common procedures that involve blood and body fluids- starting an intravenous line, suctioning a patient's throat, mouth, handling a bleeding accident victim in the emergency department- expose nurses to a variety of diseases. It is the who generally attempts to stop bleeding, cleans the patient of blood on his body, and starts blood transfusion.

An exploratory research design was used for the study to assess the incidence of needle stick injury and its contributing factors among nurses in the year 2012. A total 824 nurses were selected for the study. Data was collected by self report method to assess the needle stick injury and its contributing factors among nurse working in various hospitals at Hoshiarpur, Punjab.

About half of the subject (52.2%) of needle stick injury occurred in the critical care unit followed by general wards (35.3%). Nearly half of the subjects (49.8%) reported about needle stick injury to the ward in charge (45.5%). Most of NSI (36.0%) occurred during the drawing blood followed by recapping of used needles (18.0%), inserting intravenous line (9.4%). Injecting with precautions (4.7%), manipulating an intravenous line (3.3%), handling lancet or other device for taking samples (2.3%), respectively. Regarding the perceived factor of NSI among the subjects (22.7%) was too busy followed by lack of attention (2.6%), lack of awareness was (0.7%) respectively. There was significant association of needle stick injury with socio- demographical variable .i.e. age, working experience, professional qualification and in- service education on prevention of NSI.

Proper training and wide range of education playing significant role to provide awareness among health- care workers, as well as improving adherence to good clinical practice. Based on these findings, it is strongly recommended that there is need of frequent training and education to prevent needle stick injuries among nurses.

KEY WORDS : Needle stick injuries, occupational health safety, contributing factors.

INTRODUCTION :

Accidental exposure to blood borne diseases through needle stick injures [NSI] is very common among health care workers. They are more prone to hospital acquired transmission of blood pathogens via contaminated needles. Almost 90% of all the needles stick injuries occurred in nurses due to lack of knowledge, resources and training. About 2 millions needles stick injuries are reported in health care providers every year. But these are only the reported cases and about 40-70% cases of needles stick are unreported in developing countries.

Injuries related to needle stick are very hazardous for health care professionals, who practice with hypodermic syringes and other needle elements. Such injuries can taken place at any time when health care professionals use, disassemble, or dispose of needles. Improper disposed of needles can concealed in linen or garbage and injure to any other, who encounter them suddenly. Needle stick injuries transmit infectious diseases such as AIDS (Acquired Immune Deficiency Syndrome). Hepatitis B, and Hepatitis C and especially blood borne diseases.

Needle stick injuries continue to be common in the medical field, and needle stick safety is an important subject that must be addressed. According to the Occupational Safety and Health Administration approximately 8 million healthcare workers are at risk of occupational exposure to blood borne pathogens. According to the 2006 study of NSI and safety Devices, the majority of U.S. nurse surveyed repot being accidentally stick by a needle while working; nearly half (47%) of all nurses in the survey were stuck by a contaminated needle. Of the nurse reporting needle sticks, some were stuck multiple times.

According to the World Health Organization, 16000 Hepatitis C (HCV), 66000 Hepatitis B (HBV) and 1000 cases of HIV may have occurred worldwide in the year 2000 among health professionals usually nurses have exposure to needle stick injuries. Because needle stick injuries usually do not reported. Injuries recorded through standard occupational reporting system may underestimate the true injury rate, as much as 10-fold.

NEED OF STUDY :

While working with the patients the researchers found that the incidence of NSI in hospital among staff nurses are increasing due to many reasons e.g. recapping of used syringes, increasing due to many reason e.g. recapping of used syringes, increased nurse patients , ratio etc. through the personal experience of the researchers, they found that the staff nurses as well as the nursing students are not fully aware the proper method of needle and syringes disposal method and the consequences of the needle stick injury. Therefore researchers feel an urgent need to assess the incidence of needle stick injury and it contributing factors and post exposure.

PROBLEM STATEMENT :

An exploratory study on incidence of needle stick injury and its contributing factors among nurses working in selected hospitals at Hoshiarpur.

OBJECTIVE :

- To assess the incidence of needle stick injury among nurses.
- To assess the contributing factors of needle stick injury among nurses.
- To find the post exposure prophylaxis practice among the nurses after needle stick

injury.

- To determine association of needle stick injury with socio demographic variables i.e. age, gender, marital status, habitat, professional qualification, experience, working area, duty shift and in-service education on prevention of needle stick injury.

MATERIALS AND METHODS :

Research design

An exploratory research design was under for the study to assess the incidence of needle stick injury and its contributing factors among nurses working in Selected Hospitals, Hoshiarpur, Punjab.

Sample Variables

Age, Gender, Marital Status, Habitat, Professional Qualification, Experience, Working Area, Duty Shift and Inservice Education.

Study Setting

The study was conducted at selected hospitals of Hoshiarpur.

Target population

The target population for conducting the research study consisted of the nurses working in selected hospitals, Hoshiarpur, Punjab.

Sampling technique

Total enumerative sampling technique was employed to collect the data.

Sample Size

A total 824 nurses working in selected hospitals of Hoshiarpur were selected for the study.

Development and description of research tool

As the study was related to assess the needle stick injury and its contributing factors among nurses working in a selected hospital, Hoshiarpur. The tool was prepared on the basis of:

- An extensive review of relevant literature and
- Consultation with experts in the field of research and nursing.

The tool for data collection was a self structured questionnaire and it consists of the following:

Section 1: Sociodemographic data e.g. age, gender, marital status, habitat, professional qualification, experience, working area, duty shift, inservice education on prevention of needle stick injury.

Section 2 (a): Questionnaire was prepared to find out the incidence of needle stick injury. This part consists of 12 items.

Section 2 (b): Checklist was prepared to find out the contributing factors of needle stick injury. This part consists of 13 items.

Validity of research tool

The validity of research tool was checked as follows:-

- Consultation with guide regarding content and language of the tool.
- The tool was given to the experts from different nursing fields for the validation of the tool.
- Tool was found complete in terms of content and clarity of language. However, some changes were incorporated as per requirement after consultation with guide.

Reliability of research tool

The reliability of research tool was confirmed by split half method.

Data collection procedure

Data collection was done in the month April and May 2012. Prior permission was taken from the Nursing Superintendent of hospitals and consent from samples. Data was collected by self report method to assess the needle stick injury and its contributing factors among nurses.

Ethical considerations

This study did not include any intervention on the subjects. A written permission was taken from Superintendent of hospitals. An informal verbal consent was also taken from the subjects. Anonymity of subjects and confidentiality of information was maintained. It was ensured that the study did not affect the subjects in any way.

ANALYSIS AND INTERPRETATION OF DATA :

Table 1: Socio demographic profile of subjects

Sociodemographic Variables	f (%)
Age (In Yrs.)	
20-30	538 (65.3)
31-40	235 (28.5)
41-50	46 (05.6)
>50	05 (00.6)
Gender	
Male	16 (01.9)
Female	808 (98.1)
Marital status	
Married	484 (58.7)
Unmarried	340 (41.3)
Habitat	
Rural	235 (28.5)
Urban	589 (71.5)
Professional qualification	
ANM	33 (04.0)
GNM	728 (88.3)
Post Basic B.Sc.	15 (01.8)
B.Sc.	48 (05.8)
Working Experience	
<1	78 (09.5)
1-3	180 (21.8)
4-5	189 (22.9)
>5	377 (45.6)
In-service education on prevention of NSI	
Yes	477 (57.9)
No	347 (42.1)

Table 2: Needle stick injury related profile of subjects

Variables	F (%)
Incidence of NSI	
Present	422 (51.2)
Absent	402 (48.8)
Depth of injury (n=422)	
Superficial	305 (72.3)
Moderate	103 (24.4)
Deep	14 (03.3)
Frequency of NSI	
Once	167 (39.6)
Twice	148 (35.1)
Thrice	39 (09.2)
>Thrice	68 (16.1)
Shift of NSI	
Morning	137 (37.6)
Evening	97 (26.7)
Night	130 (35.7)
Area of work while NSI	
Critical care unit	221 (52.2)
General wards	149 (35.3)
OT/OPD**	25 (06.1)
Family wards	17 (04.2)
Thalasemia	10 (02.4)

Table 2 reveals that among 824 subjects, more than half of the subjects 422 (51.2%0 experienced NSI. More than half of the subjects 305 (72.3%) had superficial injury, 103 (24.4%) had moderate and 14 subjects (3.3%) had deep injury. About 167 (39.6%) of the subjects had at least one time NSI where as 148 (35.1%) had twice followed by thrice and more than thrice i.e. (9.2%, 16.1%) respectively. Most of the NSI 137 (37.6%) occurred in the morning shift followed by night shift 130 and in the evening 97 (35.7%, 26.7%) respectively. More than half of the subjects got NSI in critical care units (52.2%) followed by general wards (35.3%), OT/OPD (6.1%), family wards (4.2%) and thalasemia ward (2.4%).

Table 3: Post Needle stick injury reporting among nurses

Variables	**F (%)**
	Report about NSI
Done	210 (49.8)
Not done	212 (50.2)
Person to whom NSI was reported (n=210)	
Ward incharge Doctor	109 (45.5)
Doctor	84 (37.8)

Nsg Supdt Colleague	09 (03.4)
Colleague	08 (04.2)
Reason for not reporting for NSI (n=212)	
Too busy	89 (41.9)
Lack of awareness	47 (22.1)
Forgetfulness	26 (12.2)
Superficial injury	16 (07.5)
Follow up is too long	10 (04.7)
Afraid of losing job	10 (04.7)
Negative viral marker of patient	10 (04.7)
Careless approach of employer	04 (01.9)

Table 3 Illustrates that among 422 subjects 210 subjects (49.8%) had reported about NSI where as 212 subjects (50.2%) had not reported the NSI. 109 subjects (45.5%) reported to the ward incharge about the NSI followed by doctor (84,37.85) nursing superintendent (9, 3.4%), colleague (8, 4.2%) respectively. Reason for not reporting NSI (41.9%) because of too busy followed by lack of awareness 47 (22.1%), forgetfulness (12.2%), superficial injury (7.5%), follow up is too long (4.7%), afraid of losing job (4.7%), negative viral marker (4.7%) and careless approach of employer (1.95) respectively.

Table 4: Post exposure prophylaxis profile of subjects.

Variables	F (%)
Post exposure management	
Wound cleaning	275 (65.2)
Tetanus vaccination	38 (09.0)
Post exposure prophylaxis	17 (04.0)

None	92 (21.8)
Time to approach for PEP (n=17)	
30 minute	08 (47.0)
1-5 hours	03 (17.6)
1 day to 1 week	06 (35.2)
Completion of course of PEP	
Yes	12 (70.5)
No	05 (29.4)
Reason for not completed the PEP (n=5)	
Busy schedule	02 (40.0)
Lack of knowledge	01 (20.0)
PEP takes more time	01 (20.0)
Negative viral marker of the patient	01 (20.0)

Table 4 depicts the response to post exposure management, more than half of the subjects 275 (65.2%) had done the wound cleaning, 38 (9.9%), took tetanus vaccination and only 17 subjects (4.4%) got the post exposure prophylaxis, whereas, 92 subjects (21.8%) did nothing after NSI. Regarding the PEP 8 subjects (47.0%) approach for PEP within 30 minute followed by 1 day to 1 week 6 (35.2%), 1-5 hrs 3 (17.6%) respectively. Only 12 subjects (70.5%) had completed the PEP. Reason for not completing the PEP was busy schedule 2 940.0%) followed by lack of knowledge 1 (20.0%), PEP takes more time 1 (20.0%), negative viral marker 1 (20.0%), respectively.

Table 5: Contributing factors of needle stick injury among nurses.

Contributing Factors*	F (%)
NSI occurred during…….	
Drawing blood	152 (36.0)
Recapping used needle	76 (18.0)
Inserting intravenous / arterial line	40 (09.4)
Injecting percutaneously	20 (04.7)
Manipulating an intravenous line	14 (03.3)
Handling lancet or other device for taking sample	10 (02.3)
Perceived factors of NSI……..	
Too Busy	96 (22.7)
Lack Of Attention	11 (02.6)
Lack Of Awareness	03 (0.7)

Table 5 reveals that most of NSI 152 (36.0%) occurred during the drawing blood followed by recapping of used needles 76 (18.0%), inserting intravenous line 40 (9.4%), injecting percutaneously 20 (4.7%), manipulating an intravenous line 14 (3.3%), handling lancet or other device for taking samples 10 (2.3%), respectively. Regarding the perceived factor of NSI among the subject 96 (22.7%) was too busy followed by lack of attention 11 (2.6%), lack of awareness was 3 (0.7%) respectively.

Table 6: Relationship of age with needle stick injury among nurses

Marital status	Incidence of needle stick injury		Total	Chi Statistics
	Present f (%)	Absent f (%)		
20-30	301 (55.9)	237 (44.1)	538	X^2=22.122 df=3 p=0.001*
31-40	105 (44.7)	130 (55.3)	235	
41-50	12 (26.1)	34 (73.9)	46	
>50	04 (80.0)	01 (20.0)	05	
Total	422 (51.2)	402 (48.8)	824	

Table 6 reveals that the subjects who belong to the age group of >50 years had higher needle stick injury (80.0%) as compared to other age group. This was found to be statistically significant at the level of (p<0.001).

Table 7: Relationship of marital status with needle stick injury among nurses

Marital status	Incidence of needle stick injury		Total	Chi Statistics
	Present f (%)	Absent f (%)		
Married	237 (49.0)	247 (51.0)	484	*X^2=2.3696 df=1 p=0.1236 NS*
Unmarried	185 (54.4)	155 (45.6)	340	
Total	422 (51.2)	402 (48.8)	824	

Table 8 interprets the incidence of needle stick injury was higher (54.4%) among married than unmarried (49.0%). But it was found that there is no statistical association between needle stick injury and marital status.

Table 8 : Relationship of habitat with needle stick injury among nurses

Habitat	Incidence of needle stick injury		Total	Chi Statistics
	Present f (%)	Absent f (%)		

Rural	125 (53.2)	110 (46.8)	235	X2=0.5148 df=1 p=0.4730 NS
Urban	297 (50.4)	292 (49.6)	589	
Total	422 (51.2)	402 (48.8)	824	

Table 8 illustrates the incidence of needle stick injury was higher 125 (53.2%) among rural than the urban 297 (50.4%). But it was found that there is no statistical association between needle stick injury and habitat.

Table 9: Relationship of working experience with needle stick injury among nurses

Working experience	Incidence of needle stick injury		Total	Chi Statistics
	Present f (%)	Absent f (%)		
<1	40 (51.3)	38 (48.7)	78	$X^2=8.0511$ $df=3$ $p=0.05^{NS}$
1-3	99 (55.0)	81 (45.0)	108	
4-5	109 (57.7)	80 (42.3)	189	
>5	174 (46.2)	203 (53.8)	377	
Total	422 (51.2)	402 (48.8)	824	

Table 9 reveals that the nurses who have working experience of 4-5 years had higher incidence (57.7%) of needle stick injury than the others. It was found that to be statistically significant at the level of ($p<0.05$).

Table 10: Relationship of professional qualification with needle stick injury among nurses

Professional qualification	Incidence of needle stick injury		Total	Chi Statistics
	Present f (%)	Absent f (%)		
ANM	09 (27.3)	24 (72.7)	33	
GNM	365 (55.0)	363 (49.9)	728	
Post Basic B.Sc.	109 (57.7)	06 (40.0)	15	$X^2=25.70$ $df=3$ $p=0.001^{NS}$
B.Sc.	174 (46.2)	09 (18.7)	48	
Total	422 (51.2)	402 (48.8)	824	

Table 10 depicts that the B.Sc. nurses experienced higher (81.3%) needle stick injury than others health care workers. It was found to be statistically significant at the level of ($p<0.001$).

Table 11: Relationship of in-service education with needle stick injury among nurses

In-service Education	Incidence of needle stick injury		Total	Chi Statistics
	Present f (%)	Absent f (%)		
Yes	263 (55.1)	214 (44.9)	477	X2=6.975 df=1 p=0.001NS
No	159 (45.8)	188 (54.2)	347	
Total	422 (51.2)	402 (48.8)	824	

Table 11 interprets that the nurses who attended in-service education on prevention of needle stick injury had higher (55.1%) needle stick injury than those who did not attended (45.8%) any in-service education on prevention of needle stick injury. It was found to be statistically significant at the level of ($p<0.001$). This may be because that they have not concentrated or did not follow the precautions carefully during the procedures.

CONCLUSION :

Finding of the study were concluded as following:

1. More than half of the subjects (65.3%) belong to the age group of 20-30 years and maximum (98.1%) were females.
2. More than half of the subjects (58.7%) were married and were from urban area (71.5%), with GNM (88.3%).
3. More of the subjects (45.7%) had working experience of >5 years and more than half of the subjects (57.9%) had in-service education o prevention of needle stick injury.
4. More than half of the subjects 422 (51.2%) had reported about the needle stick injury whereas 402 (48.8%) had remained without reporting.
5. More than half of the subjects 305 (72.3%) had superficial injury, 103 (24.4%) had moderate and 14 subjects (3.3%) had deep injury.
6. About 167 (39.6%) of the subjects had at least one time NSI where as 148 (35.1%) had twice followed by thrice & more than thrice i.e. (9.2%, 16.1%) respectively.
7. Most of needle stick injury (37.6%) occurred in morning shift and in the evening shift was (26.7%).
8. Half of the subjects (52.2%) of needle stick injury occurred in the critical care unit followed by general wards (35.3%).
9. Nearly half of the subjects (49.8%) reported about needle stick injury to the ward incharge (45.5%).
10. Most of NSI 152 (36.0%) occurred during the drawing blood followed by recapping of used needles 76 (18.0%), inserting intravenous line 40 (9.4%), injecting percutaneously 20 (4.7%), manipulating an intravenous line 14 (3.3%), handling lancet or other device for taking samples 10 (2.3%), respectively.
11. Regarding the perceived factor of NSI among the subjects 96 (22.7%) was too busy followed by lack of attention 11 (2.6%), lack of awareness was 3 (0.7%) respectively.
12. There was significant association of needle stick injury with socio-demographic variable i.e. age, working experience, professional qualification and in-service education on prevention of NSI.

RECOMMENDATIONS :

Based on the present study findings, it is recommended that:

- A similar study can be conducted on large sample to generalize the findings.
- Multicentre studies can be conducted involving more number of subjects and institutions.

- In-service education must be planned to reduce the risk of needle stick injury and awareness of post exposure prophylaxis among nurses.
- A modified tool may be developed and implemented as the subjects may not have sufficient time to respond a long questionnaire.
- It is suggested that patient nurse ratio should be decreased to reduce the risk of needle stick injury incidence.

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