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Prevalence of Needle Stick Injury among Nursing Staff Working at a Tertiary Care Hospital in Latur District of Maharashtra

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ABSTRACT
Nursing staff are the back bone of health care. Needle stick injuries are the occupational hazard faced by nursing staff which carry risk of transmission of infections like HIV, HBV, HCV. It is estimated that 50 percent of needle stick injuries that occur are among nurses. The present study was conducted to see the prevalence of the needle stick injury among nursing staff and their knowledge, attitude and practice towards it. A Hospital based cross-sectional study was conducted at the tertiary care hospital in Latur district, Maharashtra. All the nursing staff who gave consent to participate in the study were taken as sample size. Total staff is 316, out of which 280 staff has given consent to participate in the study. A preformed and pretested questionnaire was used to gather data on NSI, then entered in Microsoft Excel and analysed with SPSS. Out of 280 staff participated in the study, 205 were female and 75 were male. A total of 73 (26.07%) participants had needle stick injury but only 39 (53.42%) reported to the hospital authority. Most common (39.72%) procedure during which injury occurred is injecting drugs. 72.85% and only 8.2% respectively are aware that Hepatitis B and Hepatitis C are transmitted through Needle stick injury. The study revealed that knowledge associated with needle stick injury is inadequate. Regular training sessions should be conducted to nursing staff on risk and preventive measures of needle stick injury.

INTRODUCTION

Needle stick injuries are defined as any penetrating wound with an instrument that is potentially contaminated with body fluids of another person. Needles and sharps are one of the most hazardous wastes generated in health care[1,2]. Even though guidelines for NSI and needles and sharp waste management have decreased the risk of NSI over the past 30 years, these injuries continue to happen. NSI may be caused by hypodermic needles, blood collection needles, suture needles, IV Cannulas. Accidental Needle stick injuries are one of the most common occupational hazards faced by healthcare workers especially nursing staff as they have maximum exposure to needles. They may be caused at different healthcare activities like administering drugs, recapping activity, segregation and disposal of needle and sharp waste etc[3].

WHO estimates that globally, 2 million healthcare workers sustain needle stick injuries every year among which 50 percent are nursing staff. Needle stick injuries may cause more than twenty types of serious blood borne infectious diseases, most significant among them are Hepatitis B virus (HBV) Hepatitis C virus (HCV) Human immunodeficiency vdirus (HIV). The transmission rate of infection per injury 0.3 percent in HIV, 3 percent in Hepatitis C and 6-30 percent in Hepatitis B.

According to WHO, NSI are the cause of 36.7 percent HBV, 39 percent HCV, 4.4 percent HIV/AIDS infections. It is estimated that approximately 66,000 HBV, 16000 HCV and 200-5000 HIV infections occur among healthcare workers annually worldwide. Infections HIV and HCV does not have any prophylactic immunisation and the only way to avoid them is to prevent NSI. Apart from infectious diseases, NSI also lead to psychological consequences like anxiety, depression and emotional stress. Due to this risk of diseases Needle and sharp waste should be managed properly to ensure the safety of Health care workers and the community at large[4,5].

According to CDC, even though developing countries have the most prevalence of Needle stick injuries, their incident documentation is very less. So the injuries noticed through reporting system may underestimate the true NSI rate as much as 10 times. Most of the NSI can be prevented if circumstances of injury are known and suitable preventive measures are taken. Understanding their knowledge and practice gap can give a hint on measures an institution need to take to prevent NSI. Hence the present study is conducted to estimate the prevalence and to know the knowledge, attitude and practice among nursing staff towards NSI.

MATERIAL AND METHODS

Study design and setting: A Hospital based cross-sectional study was conducted among all the nursing staff working at tertiary care centre in the district of Latur, Maharashtra.

Study population and sample size: Total staff is 316, but 280 gave consent to participate in the study, so a sample size of 280 was taken.

Study duration: Present study was conducted from January-march 2023.

Data collection: Data was collected after getting the approval of the Institutional Ethics Committee. Data was collected using a preformed, pretested questionnaire. Consent was taken and confidentialilty was maintained during the collection of data. The questionnaire contains the details like demographic data (age, gender, years of experience) knowledge and attitude regarding needle stick injury, infections caused by NSI, protocol to be followed after NSI, Reporting of incident. Practice after NSI, whether to report, wash hands, get tested for infections.

Data analysis: Data collected was coded and entered in Excel sheets and then was analysed using SPSS.

RESULTS

Out of 280 staff, A total of 73 (26.07%) participants were reported of having Needle stick injury, so the prevalence of the NSI is 26.07 percent. Among 280 participants, 205 (73.21 per) were females and 75 (26.79 per) were males. frequency of NSI was high among females (79.45%) but it is not statistically significant. Mean age of the staff that incurred NSI was 36.42 and the high rate of injuries were found in age group 20-29 years (36.98%) followed by 40-49 years (31.50%) which was found to be significant. Average years of experience among staff with NSI was 10.74 years. Among the nurses that had NSI 30.13 per had 6-10 years of experience while 27.39 per had less than 5 years of experience which is statistically significant (Table 1). Injecting drugs (39.72%) followed by handling sharp waste (20.54%) were the common procedures in which injuries occurred (Table 2). Knowledge related to NSI was assessed, study subjects that know HIV and HBV are transmitted through NSI were 100 per and 72.85 per respectively but only 23 (8.2 per) know that HCV is transmitted. About wound management, 100 per staff know to wash the wound after injury and 178 (67.50 per) know not to squeeze the wound. Staff with knowledge of not recapping the needle was 67.50 per while 56.07 per staff had knowledge about the guidelines for disposal of sharp waste (Table 3).

In attitude related to NSI, all staff agree that they should wash the wound after NSI but 59.64 per agree about not squeezing the wound. Staff that agree to report to the authorities if they had NSI were 81.78 per

Table 1: Distribution of study subjects according to age, gender and job experience

	With NSI (N = 73) n (%)	Without NSI (N = 207) n (%)	Total (N = 280) n (%)	p- value
Gender				
Male	15 (20.55)	60 (28.99)	75 (26.79)	x^2-1.95, df = 1
Female	58 (79.45)	147(71.01)	205 (73.21)	p>0.05
Age				
Mean±SD	36.42±10.76	34.36±8.95	34.90±9.48	x^2-10.17, df = 3
20-29	27 (36.98)	73 (35.26)	100(35.71)	p<0.05
30-39	14 (19.17)	75 (36.23)	89 (31.78)	
40-49	23 (31.50)	48 (23.18)	71 (25.35)	
≥50	09 (12.32)	11 (05.31)	20 (7.14)	
Years of job experience				
Mean±SD	10.74±6.82	10.56±6.72	10.60±6.73	
≤5	20 (27.39)	76 (36.71)	96 (34.28)	
6-10	22 (30.13)	19 (09.17)	41 (14.64)	x^2-23.60, df=4
11-15	11 (15.06)	56 (27.05)	67 (23.92)	<0.05
16-20	11 (15.06)	42 (20.28)	53 (18.92)	
≥20	09 (12.32)	14 (06.76)	23 (08.21)	

Table 2: Procedure in which NSI occurred. (n = 73)

Procedure	Frequrequ
Injecting drugs	29 (39.72)
Handling sharp waste	15 (20.54)
Assisting in surgery	09 (12.32)
Drawing blood sample	09 (12.32)
Recapping needle	07 (09.58)
Others	04 (05.47)
Total	73 (100)

Table 3: Knowledge of study subjects about NSI (n = 280)

Do you know the infections transmitted by NSI?	Yes n (%)	No n (%)
HIV	280 (100)	0(0)
HBV	204 (72.85)	76 (27.15)
HCV	23 (8.21)	257(91.79)
Do you know about wound management?		
Washing the wound	280 (100)	0 (0)
No squeezing of blood	178 (63.57)	102(36.43)
Do you know about no recapping?	189 (67.50)	91(32.50)
Do you know about disposal of needle and sharp waste?	157 (56.07)	123(43.93)
Do you about HBV vaccination?	211(75.35)	69(24.65)

Table 4: Attitude of study subjects towards NSI (n = 280)

1.Do you agree about local wound management;	Yes. n (%)	No. n (%)
Washing the wound	280 (100)	0
No squeezing of blood	167 (59.64)	113 (40.36)
Do you agree about reporting to the authorities after injury?	Yes	N o
	229 (81.78)	51 (18.22)
Do you agree about getting tested for HIV/ HBV after injury?	Yes	No
	169 (60.36)	111 (39.64)
Do you agree about taking PEP?	Yes	No
	219 (78.21)	61 (21.79)

Table 5: Practice of study subjects after NSI (n = 73)

	Yes. n (%)	No. n (%)
Rinsed with soap and water?	54 (73.97)	19(26.03)
Reported to the authorities?	39 (53.42)	34(46.58)
Screened for infections?	24 (32.88)	49 (67.12)

and 60.36 per agree to testing while 78.21 per agree to take post exposure prophylaxis treatment (Table 4). Practice after NSI among staff revealed that 73.97 per cleaned the injured site with soap and water, 53.42 per reported to the authorities after NSI, while only 32.88 per screened for infections after NSI (Table 5).

DISCUSSIONS

The study assessed prevalence of needle stick injury to be 26.07 per which is considerably lower than studies conducted in tertiary care hospital in North India by Bharti *et al.*[6] 66.7 per Datar *et al.*[7] 30.3 per and 69 per at Hospital in Bareilly conducted by Gupta *et al.*[8] low prevalence may have been due to low reporting of NSI by staff for various reasons as this study is based on self-administered questionnaire. present study shows NSI occurred mainly in female 79.45 per can be due to majority nursing staff being female which is similar to study conducted by Gupta *et al.*[8]. The present study has 20-29 years as the majority with NSI which is similar to the study by Deshpande *et al.*[9] and contradicting to the study conducted by Mohapatra *et al.*[10] which has 30-35 years as the majority. Job experience of most staff is ≤5 years unlike the study conducted by Alsabaani *et al.*[11] which is 6-10 years. Most common procedures in which NSI occurred is injecting drugs (39.74 per) followed by handling of sharp wastes which is similar

to study conducted by Laishram *et al.*[12] but study conducted by Alsabaani *et al.*[11] showed NSI occurred during IV cannula (33 per) while study by Gupta *et al.*[8] showed NSI occurred during venipuncture followed by recapping of needle.

All the staff have knowledge about transmission of HIV through NSI but knowledge about transmission of HCV is too low 8.2 per which is unlike the study by khelgi *et al.*[12] which is 42.7 per. According to ICMR and CDC prevention of needle stick injury guidelines recapping of needles is avoided[1,3] but 67.50 percent of the staff in the present has knowledge of it which similar to Radha *et al.*[14] with 66 per this shows the need and importance of nursing education sessions on NSI prevention by the hospital institutions. Vaccination is one of the effective ways to prevent infectious diseases but it is available only for HBV, though all health care workers are recommended to take HBV vaccine, only 75.35 per staff have knowledge about it. Though all the staff has knowledge and positive attitude towards washing of injured site, only 73.97 per has practiced it after the injury, which is high to that of a study by Laishram *et al.*[12] and Radha *et al.*[14] In the present study 53.72 per staff reported the injury to the hospital authorities and staff that screened for infections is even less with 32.88 per which is more compared to the study by Deshpande *et al.*[9].

This study is done in nursing staff as they are more prone to Needle stick injuries and the results of this study may not be generalized to other nurses working in hospitals in the state. The results emphasize the need of promotion of safety measures to prevent NSI.

CONCLUSION

The needle stick injuries and there under reporting is still a concern among Nursing staff. Continuous Nursing Education on hazards, preventive measures, post-exposure prophylaxis, treatment to Needle stick injury for nursing staff should be conducted by the hospital authorities to reduce risk and under reporting of NSI. Regular training and monitoring should be done at Bio-medical waste management to eliminate risk of NSI.

LIMITATIONS: As the Data was collected with a self-administered questionnaire, it may lead to Information and social Bias.

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