

A Study of Safe Injection Practices and Needle Stick Injuries among the Nursing Personnel in a Tertiary Care Hospital in Kolkata

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Abstract : Needle stick injury is a major occupational health and safety issue among the health care workers. The Objectives of the present study were to evaluate the knowledge and attitude regarding safe injection practices and to explore the occurrence of needle stick injuries among the nursing personnel in a tertiary care hospital in Kolkata. It was a cross-sectional, descriptive study conducted in Medical College, Kolkata. Total 63 staff nurses were studied during the 3 month study period (Feb 2014-April 2014). The mean age of the nursing personnel was 36.78± 7.58 years (range 25 to 58 years). Out of the study population 92.05% were vaccinated against Hepatitis B and 56(88.88%) had received training of "safe injection practice" in last 2 years. Among them 90.47% (57) had knowledge regarding "safe injection practice" and 82.54% (52) had knowledge regarding necessary to wear gloves during injection procedure. The entire staff nurses (100%) had knowledge regarding correct use of syringe and 87.30% nursing personnel had knowledge regarding correct disposal of needle. "Disposable syringe better than sterile glass syringe" was strongly agreed by 71.43% of staff nurse. Use of gloves not possible agreed by 69.84%. Hub cutter is necessary in the ward agreed by 35(55.55%). Washing or disinfecting of hands thoroughly before and after giving injection is absolutely necessary agreed by 52.38%. Among them 36 (57.14%) had needle stick injury and all of them were single episode. Most of the events (44.44%) of Needle stick injury occurred during disassembling needle /sharp device and mostly during evening (47.22%).

Keywords: safe injection practices, needle stick injuries (NSI), nursing personnel

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I Introduction

Needle stick injury is a major occupational health and safety issue faced by health care workers. Increase in the incidence of deadly infections due to greater exposure to micro-organisms and viruses that cause blood-borne infections, such as the human immunodeficiency virus (HIV) and the Hepatitis B and C viruses has led the medical community to initiate efforts to prevent and limit exposure among health care workers (HCW). On this background we conducted the study among the nursing personnel in our institution. **'A safe injection'**: The World Health Organization defines 'a safe injection' as one that does not harm the recipient, does not expose the provider to any avoidable risk, and does not result in any waste that is dangerous to the community. To achieve this, the injection needs to be administered using a sterile syringe and needle. After administration, sharp equipment needs to be discarded in a puncture-proof container for appropriate disposal. Any break or departure from this procedure represents a risk, rendering the injection unsafe.^[1] **Needle stick injury (NSI)** means the parenteral introduction into the body of healthcare worker, during the performance of their duties, of blood or other potentially hazardous material by a hollow bore needle or sharp instruments, including, but not limited to, needles, lancets, scalpels, and contaminated broken glass.^[2]

II Methodology

Our study was an observational descriptive study to evaluate the safe injection practices and needle stick injuries among the nursing personnel in a tertiary care hospital, Kolkata. This cross-sectional study was conducted in Medical College, Kolkata. The study population was staff nurses from Medicine, Emergency, Surgery and Gynae & Obs department. Baseline demographic data, immunization status against Hepatitis B and training status of "safe injection practice" in last 2 years were recorded. Data was captured on a pre-designed pre-tested semi structured questionnaire. Knowledge information was taken about different questions eg. type of syringe used, wearing of gloves during procedure, treatment of used needle, disease associated with NSI and action taken after NSI. To obtain information regarding attitude Likert scale was chosen.

III Results

During the 3 month study period (Feb 2014-April 2014), total 63 staff nurses were recruited from medicine, surgery, gynecology & obstetrics and emergency ward of Medical College Kolkata. Among the staff nurses majority (47.62%) are of age group 30-34years .The mean age of the staff nurses was 36.78± 7.58 years(Range 25 to58 years).The mean duration of service of them was 86.79± 78.38 months. (Range 1 -360 months). Out of the study population 17(25.98%) staff nurses were recruited from Medicine and 10 (15.87%) from Emergency department.18 (28.57%) staff nurses were recruited from both Surgery department and Gynae &Obs department. Out of the study population 92.05% were vaccinated against Hepatitis B and 56(88.88%) nursing personnel had received training of “safe injection practice” in last 2 years. (Table 1)

Table 1: Profile of nursing personnel

	Numbers (%)	
Distribution according to posting in different departments	Emergency department	10(15.87)
	Medicine department	17(25.98)
	Surgery department	18(28.57)
	Gynae &Obs department	18(28.57)
Immunization status against Hepatitis B	Vaccinated	58(92.05)
	Not vaccinated	5(7.95)
Training status of “safe injection practice” in last 2 years	Training received	56(88.88)
	Not received	7 (11.12)

Knowledge and attitude:

Among them 90.47% (57) had knowledge regarding “safe injection practice”. Out of the nursing personnel 82.54% had knowledge regarding necessary to wear gloves during injection procedure. The entire staff nurses100% (63) had knowledge regarding correct use of syringe. Out of the study population 87.30% (55) had knowledge regarding correct disposal of needle. Among the staff nurses 84.12% (53) had correct knowledge regarding the disease transmission with NSI. Knowledge about the “Action should be taken after NSI” 57.14% staff nurses said that they wash the area with soap and water. Among them 87.30% had knowledge regarding availability of PEP (post exposure prophylaxis (Table-2).Disposable syringe better than sterile glass syringe strongly agreed by 71.43% staff nurse. During busy schedule use of gloves not possible agreed by 69.84%. Hub cutter is necessary in the ward agreed by 35(55.55%). Washing or disinfecting of hands thoroughly before and after giving injection is absolutely necessary strongly agreed by 33(52.38%). There is no harm in recapping needle after uses disagreed by 32(50.79%).Used needles, sharps can only be disposed in puncture proof container strongly agreed by 33(52.38%). One should always disinfect local site before procedure strongly agreed by 36.51%. Post exposure prophylaxis does not influence the probability of HIV/Hepatitis disagreed by 38(60.32%).Segregation of bio-medical waste is a mandatory procedure strongly agreed by 36(57.14%) nursing personnel (Table-3).

Table-2. Knowledge regarding “safe injection practice”

Knowledge about	Numbers (%)	
Knowledge about the term “safe injection practice”	Yes	57(90.47)
	No	6 (9.53)
Necessity to wear gloves	Yes	52 (82.54)
	No	11(17.46)
Correct type of syringe to be used	Yes	63 (100)
	No	0(0)
Disposal of used needle	Correct	55(87.30)
	Incorrect	8 (12.70)
Disease transmission with needle stick injury	Correct	53(84.13)
	Incorrect	10 (15.87)
“Action should be taken immediate after needle stick injury”	Clean the wound with sprit swab	7(11.11)
	Wash with soap and water	36(57.14)
	Apply readily available bandage	4(6.35)
	Wash with water only	16(25.39)
Availability of PEP (post exposure prophylaxis)	Correct	55(87.30)
	Incorrect	8(12.70)

Table-3. Attitude regarding Needle stick injury and safe injection practice (n=63)

Attitude regarding NSI and safe injection practice	Strongly agree No. (%)	Agree No. (%)	Uncertain No. (%)	Disagree No. (%)	Strongly disagree No. (%)
Disposable syringe better than sterile glass syringe	45(71.43)	4(6.35)	0	14(22.22)	0
During busy schedule use of gloves not possible	6(9.52)	44(69.84)	3(4.76)	7(11.11)	3(4.76)
Hub cutter is necessary	26(41.27)	35(55.55)	3(4.76)	0	0
Hand Washing before and after giving injection is absolutely necessary	33(52.38)	10(15.87)	9(14.29)	11(17.46)	0
No harm in recapping needle after use	2(3.17)	11(17.46)	2(3.17)	32(50.79)	16(25.40)
Used needles, sharps can only be disposed in puncture proof container	25(39.68)	33(52.38)	0	5(9.94)	0
One should always disinfect local site before procedure	23(36.51)	22(43.92)	12(19.05)	6(9.52)	0
Post exposure follow-up only induces anxiety and worry	2(3.17)	27(42.86)	2(3.17)	27(42.86)	5(9.94)
PEP does not influence the probability of HIV/Hepatitis	2(3.17)	14(22.22)	7(11.11)	38(60.32)	2(3.17)
Segregation of bio-medical waste is a mandatory procedure	36(57.14)	21(33.33)	3(4.76)	0	3(4.76)

Occurrence of needle sticks injury (NSI):

Among the nursing personnel 57.14% (36) had needle stick injuries. The incidence of needle stick injury in last 30 days was 9.52% (6) and all of them were single episode. Most of the cases 26(72.22%) the reason for their injury was rushed for all nurses having needle stick injury. “Could not prevent” and Fatigue was mentioned by 8.33%. Lack of assistance was mentioned by 11.11% staff nurses.(Fig 1).Most of the events of NSI occurred during disassembling needle /sharp device (44.44%) followed by disposal of needles or sharps (19.44%).(Fig 2). Among them needle stick injuries had occurred mostly during evening 17 (47.22%). No significance found between occurrence of needle stick injury with duration of service/training among staff nurses (p =0.512). (Table- 4)

Figure -1. Risk factors of NIS as mentioned by nursing personnel having needle stick injury (n=36)

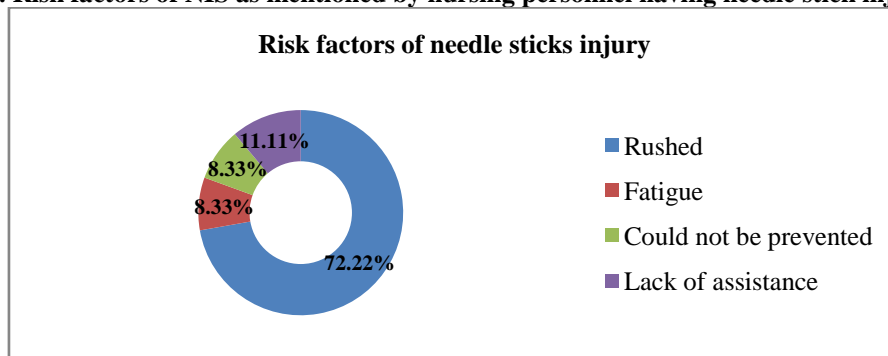


Figure-2. Activities during NSI as mentioned by personnel having needle stick injury (n=36)

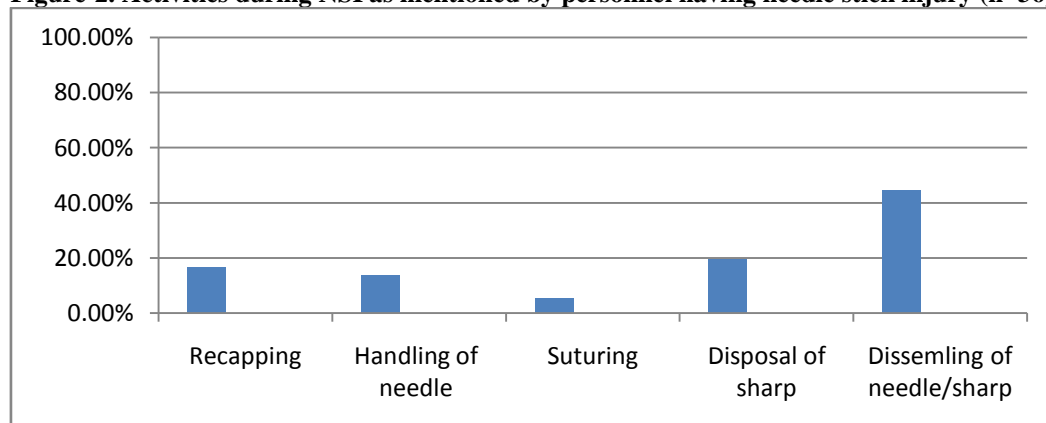


Table 4. Distribution of duration of service according to presence of needle sticks injury (n=63)

Duration of service (Years)	Needle stick injury		Chi-square test
	Present	Absent	
0-5	17	14	$\chi^2 = 2.302$ df =3 p =0.512
6-10	11	5	
11-15	5	3	
>15	3	5	

IV Conclusions

Results of this study highlighted that most of the nursing personnel (92.05%) were vaccinated against Hepatitis B and 56(88.88%) had received training of “safe injection practice” in last 2 years. Among them 90.47% (57) had knowledge regarding “safe injection practice” and 82.54% (52) had knowledge regarding necessary to wear gloves during injection procedure. The entire study population had knowledge regarding correct use of syringe and 87.30% nursing personnel had knowledge regarding correct treatment of needle. They should try to increase knowledge regarding needle stick injury. Disposable syringe better than sterile glass syringe strongly agreed by most of the nursing personnel. Use of gloves not possible agreed by 69.84%. Hub cutter is necessary in the ward agreed by 35(55.55%) nursing personnel. Washing or disinfecting of hands thoroughly before and after giving injection is absolutely necessary agreed by 52.38%.Among the study population 57.14% had needle stick injury and all of them were single episode. Most of the events of Needle stick injury (44.44%) occurred during dissembling needle /sharp device and mostly during evening.

V Discussion

In our study total 63 staff nurses were recruited from medicine, surgery, gynecology & obstetrics and emergency ward of Medical College Kolkata. Among the staff nurses majority (47.62%) are of age group 30-34years .The mean age of the staff nurses was 36.78± 7.58 years(range 25 to58 years). A similar study conducted by Rampal et.al,^[3] showed mean age of the respondents was 29.7years.A study conducted by Iram Manzoor et.al^[4] showed that maximum nurses, belonged to age group 20–30 years. In our study population 92.05% were vaccinated against vaccine.^[5] In a study by Sukriti, Pati N T in a tertiary care hospital, in Delhi, in 2008 reported that 55.4% HCW were vaccinated against Hepatitis B^[6].Study done by Paul B et al^[7] found 42 (52.5%) respondents received hepatitis B vaccination.

Knowledge: In our study out of the study population 82.54% (52) had knowledge regarding necessary to wear gloves during injection procedure. A study conducted by Mukherjee .S et al^[8] showed regarding necessary to wear gloves during injection procedure 96.1 % had correct knowledge .A study conducted by Sudhir et al^[9] showed the majority of correct knowledge was observed to be relating to the use of gloves (90%).In the present study entire study population had correct knowledge regarding correct use of syringe and 87.30% (55) had knowledge regarding correct treatment of needle Hepatitis B. A similar study conducted in United States, in 2007 showed that 75% of the HCW had received hepatitis B. A study conducted by Mukherjee .S et al^[8] showed that 83.1% had knowledge regarding correct use of syringe and 89.2 % had correct knowledge regarding correct disposal of needle. Out of the study population 84.12% (53) had the correct knowledge regarding the disease transmission with NSI. Knowledge about the “Action should be taken immediate after NSI” 57.14% staff nurses said that they wash the area with soap and water.

Attitude :Our study showed that post exposure follow-up only induces anxiety, it was agree or strongly agree (46.03%) , uncertain (3.17%) ,disagree or strongly disagree (50.79%). A study conducted by M. Karbakhsh et al^[10] in 2012 showed that post exposure follow-up only induces anxiety and agree or strongly agree (12.4%) ,no ideas(12.7%) ,disagree or strongly disagree (75%) in respondent. Our study showed that use of gloves is essential- was agree or strongly agree (73.02%), uncertain (3.17%), disagree or strongly disagree (23.81%). A study conducted by M. Karbakhsh et al^[10] showed that protective devices use during medical procedures in preventing blood borne infections- agree or strongly agree (91.7%) ,no ideas(4%) ,disagree or strongly disagree (3.7%) said by respondent. **Occurrence of NIS:** Present study shows that among the staff nurses (57.14%) had needle stick injuries. In the study by Singru S et al^[11] the incidence of accidental exposure to potential infectious material was the highest among the staff nurses at 39.63%, followed by interns at 37.34%, technicians at 26.92% and least among the resident doctors at 21.01%.Study among health care workers in tertiary care hospital of India conducted by Jaybhaye D et al^[12] found that staff nurses had highest percentage 54 (50.00%), followed by resident doctors 28 (25.93%) and interns 22(20.37%) respectively .Our study shows that 36 (57.14%) had needle stick injury out of 63staff nurses .A study conducted by Joardar G et al^[13] in West Bengal, showed that 61.4% of nurses had at least one needle stick injury in last 12 months.

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