Original Article

Knowledge Attitude and Practices Regarding Needle Stick Injury Among the Nursing Staff of Jorhat Medical College and Hospital

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ABSTRACT

Background- Exposure to infectious blood and body fluid is a common problem among healthcare workers, which puts them at risk for various blood-borne infections like hepatitis B, hepatitis C, HIV, etc. Nurses are a high-risk group for occupational exposure to needlestick injuries. Better knowledge, positive attitudes, and proper practices related to needlestick injuries play a key role in reducing their incidence.

Objectives- To assess the knowledge, attitude, and practice regarding needle stick injuries among the nurses in Jorhat Medical College & hospital.

Materials and Methods- A hospital based cross-sectional study was conducted among 94 nurses selected randomly from the various clinical Departments of Jorhat Medical College and Hospital. Predesigned proforma were used among the respondents.

Results- Among the respondents, 96% were aware that blood-borne infections could occur following NSI. Similarly, 96% correctly identified the appropriate bin/box for needle disposal, and 59% were aware that used needles should not be recapped. Although 91% knew that hepatitis B vaccination provides protection against HBV, only 45% reported being vaccinated. NSI was reported by 39% of participants, of whom only 32% informed health authorities and initiated post-exposure prophylaxis (PEP). The majority (95%) of injuries occurred during the act of needle recapping. The most common immediate response following NSI was washing the injured site with soap and water (78%).

Conclusion- The study reveals that there is a wide gap in the participants' knowledge and attitude towards NSI and what they did after sustaining the injury.

Keywords: Knowledge, attitude, practices, needle stick injuries, nurses.

INTRODUCTION

Needle-stick injuries (NSIs) represent a significant occupational health and safety concern encountered by healthcare professionals worldwide. Exposure to infectious blood and body fluid is a common problem among healthcare workers, which puts them at risk for various blood-borne infections like hepatitis B, hepatitis C, HIV, etc.[1] Needle stick injuries (NSIs) are wounds caused by needles used in health-care set-up that may accidentally puncture the skin resulting in exposure to blood or other body fluids.[2] According to the World Health Organization (WHO), needlestick injuries (NSIs) are responsible for approximately 36.7% of Hepatitis B (HBV), 39% of Hepatitis C (HCV), and 4.4% of HIV/AIDS cases amongst health care workers.[3] In India, approximately 3 to 6 billion injections are administered annually, and about 62.9% of these are considered unsafe.[4]

Needlestick injuries have substantial indirect impacts on healthcare delivery, particularly in developing nations. Beyond the potential health risks, these injuries often lead to emotional distress among nurses, which can result in absenteeism and, in turn, negatively affect healthcare services and strain available resources.[5] Nurses are a high-risk group for occupational exposure to needlestick injuries due to their direct involvement in patient care tasks such as administering injections, initiating IV lines, and drawing blood samples. Earlier studies emphasized that nurses with better knowledge, positive attitudes, and proper practices related to needlestick injuries play a key role in reducing their incidence.[6]

Objectives

To assess the knowledge, attitude and practice regarding needle stick injuries among the nurses in Jorhat medical college & hospital.

MATERIALS AND METHODS

Study Setting - The study was conducted at Jorhat Medical College and Hospital (JMCH), Jorhat, Assam, India, a tertiary care teaching hospital

Study population - The study population comprised registered nursing professionals working in various clinical departments of JMCH. These individuals were regularly involved in procedures requiring the use of needles and were considered at potential risk for needle-stick injuries (NSIs).

Study Subjects- The Study subjects, comprised of 94 nurses, selected randomly from the Clinical Departments of Jorhat Medical College and Hospital.

Type of study- Hospital-based cross-sectional study.

Period of study - The present study was undertaken for a period of Two Months –June and July 2018

Ethical and legal consideration. Ethics clearance was taken from the institutional ethics Clearance Committee (Human).

Eligibility Criteria -

1. Inclusion criteria

- Registered nurses (General Nursing & Midwifery or B.Sc. Nursing qualification).
- Nurses who routinely handle needles as part of their clinical duties.
- Nurses who provided written informed consent for participation

2. Exclusion criteria

- Nursing students or trainees.
- Nurses who did not frequently handle needles.
- Individuals unwilling to participate or who did not provide complete information

Study variables

Demographic variable – age, educational status, marital status, work experience

Variables related to Knowledge, attitude and Practices regarding needle stick injuries among nurses.

Sample size

The sample size was calculated by using the following formula

$n = Z\alpha^2pq/ L^2$

Considering the prevalence (p) of needle stick injury among the nurses to be 37.4% .[7]

We have, p = 37.4% q = 62.6%. Allowable error of 10% has been taken. The sample size was calculated to be 93.6 ~ 94.

Sampling design -Simple Random Sampling

Sampling Technique- The present study was conducted in eight (8) clinical departments comprising of – Surgery (3), Medicine (33), Obstetrics and Gynaecology (5), Pediatrics (5), Orthopedics (10), ENT (6), Dermatology (10) and Ophthalmology (5).

*Number in brackets indicate the number of nurses

The total number of nurses working across these departments was 204.

To ensure representation from each department, proportionate stratified random sampling was employed. The sample size for each department was determined using the formula:

Departmental Sample Size (N) = (94 X 100)/ Total number of nurses working in the 8 selected departments = (94 × 100)/ 204

This yielded a sampling fraction of approximately 46.07%, which was uniformly applied to each department. The final selection of participants was done using the lottery method from departmental staff rosters.

Data Collection Tools and Technique

Data were collected using a pre-designed and pre-tested semi-structured questionnaire, which included both open-ended and closed-ended questions. The tool was designed to capture information on:

Demographic variables: age, gender, marital status, educational qualification, and years of work experience.

Knowledge, attitudes, and practices (KAP) related to needle-stick injury and post-exposure prophylaxis.

Data Collection Procedure

Eligible nurses were approached as per their duty rosters. Interviews were conducted in-person, ensuring minimal disruption to clinical duties. Each participant was explained the purpose and scope of the study, and verbal and written informed consent was obtained.

Analysis of data - The data obtained were entered into Microsoft Excel Program and results were analysed at the end of the study and represented through Tables

RESULTS

Table 1 shows that out of 94 respondents, most of the respondents (47%) were in the age group of 33-42 years, followed by 38% were in the age group of 23-32 years and only 2% were in the age group of 53-60 years. All (100%) the respondents were female. Majority (89%) of the respondents were married whereas 11% were unmarried. Almost all (99%) the respondents were GNM whereas only 1% had done B.Sc. nursing. Most of the respondents (40%) had an experience of 1-5years followed by 28% had an experience of 6-10 years and 12% had an experience of less than 1 year. Only 10% had an experience of 10-15 years and above 15 years respectively.

Table 2 Shows the knowledge of the respondents regarding Needle stick injury (NSI). Majority (96%) knew that blood borne infections occur following needle stick injuries, 96% had Knowledge about Biomedical waste management/ color coded bins. Majority (71%) had Knowledge regarding Universal Safety Method. A significant proportion (78%) were familiar with Post Exposure Prophylaxis (PEP)

Table 1: Socio-demographic profile of the respondents

Socio-demographic profile	No. of respondents (N=94)	Percentage (%)
Age group (years)		
23-32	36	38
33-42	44	47
43-52	12	13
53-60	2	2
Sex		
Male	0	0
Female	94	100
Marital status		
Married	84	89
Unmarried	10	11
Education		
GNM	93	99
B.Sc. nursing	1	1
Experience (years)		
<1	11	12
1-5	38	40
6-10	26	28
10-15	9	10
>15	10	10

Table 2: Distribution of respondents according to their knowledge regarding Needle stick injury (NSI)

Sl. No	Questions	Yes	No	Not sure	Total
1	Needle stick injuries are preventable	87 (93%)	3 (3%)	4 (4%)	94(100%)
2	Blood borne infections occur following needle stick injuries	90 (96%)	0	4(4%)	94(100%)
3	Knowledge about Biomedical waste management/color coded bins	90(96%)	1(1%)	3(3%)	94(100%)
4	Knowledge about not to be recapped the used needles	55 (59%)	39 (41%)	0	94(100%)
5	Knowledge about Correct bin/ box for disposal of used needles	86 (96%)	1(1%)	3(3%)	90 (100%)
6	Prevention of Hepatitis B infection following Hepatitis B vaccine	86 (91%)	1(1%)	7(8%)	94(100%)
7	Knowledge regarding availability of Hepatitis-B Vaccine in Jorhat Medical College	82 (95%)	2 (2%)	2 (3%)	86(100%)
8	Knowledge regarding Universal Safety Method	67 (71%)	27 (29%)	0	94(100%)
9	Knowledge whether adoption of Universal Safety Method reduces the risk of disease transmission or not	50 (75%)	3 (4%)	14 (21%)	67(100%)
10	Knowledge regarding ART center	84 (90%)	6 (6%)	4 (4%)	94 (100%)
11	Knowledge regarding Post Exposure Prophylaxis (PEP)	73 (78%)	12 (13%)	9 (9%)	94 (100%)

Table 3 shows that out of 90 respondents who knew that blood-borne infections occur following NSI, 99% knew that HIV/AIDS is transmitted through needle stick injury, followed by Hepatitis B (84%) and Hepatitis C (33%).

Table 3: Distribution of respondents according to their knowledge regarding the type of diseases transmitted through NSI

Disease transmitted through NSI	No. of Respondents (N=90)	Percentage (%)
HIV/AIDS*	89	99
Hepatitis A	14	16
Hepatitis B*	76	84
Hepatitis C	30	33
Tetanus/Cholera	14	16
Pneumonia/Tuberculosis	5	5

*Multiple response

Table 4 reveals attitude towards NSI. The majority of the respondents (96%) thought that NSI is a matter of concern. Most (59%) felt that there is no necessity of recapping the used needles and 41% feel that it was necessary. Majority (98%) thought that the used needles should be discarded immediately and 2% were not sure about it. Almost all (99%) thought that there is necessity of wearing gloves in the workplace before giving injection or instrument cleaning. Out of 90 respondents who knew about colour coding segregation in BMW, majority (99%) thought that there is necessity of colour coded bins. A significant proportion (68%) felt the necessity to maintain a record of NSI and 72% of the respondents felt the necessity of a designated person to be made available for management of NSI.

Table 5 reveals the practice of the respondents. Out of 55 respondents who had the knowledge about not to be recapped the used needles, among them 40% of the respondents still practicing recuing of used needles. All 100% took precautionary measures for prevention of NSI. Out of 86 respondents who knew that Hepatitis B vaccination protects themselves from HB infection, among them only, 45% had received Hepatitis B vaccine. About 39% had recent history of exposure of needle stick injury. Out of 37 respondents who had exposure of NSI, most (68%) didn't initiate PEP following NSI.

Table 4: Attitude towards NSI

Sl. No	Questions	Yes	No	Not sure	Total
1	Respondents who thought that NSI is a matter of concern	90 (96%)	4 (4%)	0	94 (100%)
2	Respondents who thought that NSI are frequent event in health care setting	86 (91%)	3 (3%)	5(6%)	94(100%)
3	Necessity of recapping of used needles	55 (59%)	39 (41%)	0	94(100%)
4	Necessity to do with the used needle	92 (98%)	0	2 (2%)	94(100%)
5	Necessity to do some measures following NSI	89 (95%)	1 (4%)	4 (1%)	94(100%)
6	Necessity of using gloves in the workplace before performing any procedure	93 (99%)	1 (1%)	0	94(100%)
7	Necessity of the reporting of NSI	87 (93%)	0	7 (7%)	94(100%)
8	Necessity of color-coded bins	89 (99%)	1 (1%)	0	90(100%)
9	Necessity to maintain a record of NSI	64 (68%)	15 (16%)	15 (16%)	94(100%)
10	Necessity of a designated person to be made available for management of NSI	68 (72%)	21 (23%)	5 (5%)	94(100%)

Table 5: Practice related questions

Sl. No	Questions	Yes	No	Total
1	Practices of recapping of used needles	22(40%)	33(60%)	55 (100%)
2	Precautionary measures taken	94 (100%)	0	94(100%)
3	Respondents who had received Hepatitis B vaccine	39 (45%)	47 (55%)	86(100%)
4	Initiation of Post exposure prophylaxis following NSI	12 (32%)	25 (68%)	37(100%)
5	Reporting of NSI to Health facility authority	12 (32%)	25 (68%)	37(100%)

Table 6 shows that out of 94 respondents, 39% had recent history of NSI and most (49%) had injury during morning shift. Majority (95%) had injury while recapping a needle. Most common reason given for NSI was heavy workload followed by tiredness (67%).

Table 6. Distribution of respondents according to the status of needle stick injuries recently

Characteristics	No. of respondents	Percentage (%)
History of exposure of NSI in last one year	**(N=94)**	
Yes	37	39
No	57	61
Could not recall	0	0
Total	**94**	**100**
Incidence of NSI recently	**(N=37)**	
Once	9	24
2-3 times	12	32
>3 times	16	44
Total	**37**	**100**
Shift of duty when NSI occurred	**(N=37)**	
Morning	18	49
Evening	8	21
Night	11	30
Total	**37**	**100**
Activity done during NSI	**(N=37)**	
Recapping a needle*	35	95
Drawing blood sample*	17	46
Carelessly handling a needle	0	0
During suturing*	30	81
Others*	7	19
Reasons for NSI		
Heavy workload*	35	94
Tiredness*	25	67
Inattention	0	
Lack of protective measures	0	
Total	37	100

*Multiple response

Table 7 shows that majority (91%) followed appropriate procedures in handling and disposing the sharp items, 89% washed hands and other exposed skin surface and 62% use barriers for prevention of NSI.

Table 7: Distribution of the respondents according to the types of precautionary measures taken for prevention of NSI

Type of precautionary measures taken	No of respondents (N=94)	Percentage
Washed hands & other exposed skin surfaces*	84	89
Follow appropriate procedures in handling & disposing the sharp items*	86	91
Routinely used barriers such as gloves, eye protection & gowns*	58	62
Others	0	0

*Multiple response

Table 8 shows that Out of the 37 respondents having NSI, majority of respondents (78%) cleaned the site with water and soap followed by 60% cleaned with antiseptics and 51% expressed blood from the site.

Table 8: Distribution of respondents on the basis of the action taken after NSI

Immediate action after a needle stick injury	No. of Respondents (N=37)	Percentage (%)
Clean the site with water and soap*	29	78
Clean with antiseptic (e.g. methylated spirit)*	22	60
Express blood from the site*	19	51
Take no action	1	3

*Multiple response

DISCUSSION

The present study revealed that 93% of the nurses had knowledge that needle stick injuries were preventable, and 96% knew about the blood borne infections following NSI. In contrast, a study conducted by Madhavan A et al where only 48.9% had knowledge of infections transmitted through NSI.[6] This discrepancy may be attributed to better education and awareness among nurses working at Jorhat Medical College. In our study, 96% of the participants correctly identified the appropriate bin/box for the disposal of used needles, whereas a lower percentage (62.3%) was observed in a similar study conducted by J. Gogoi et al.[8] Furthermore, 78% of the nurses in our study exhibited knowledge regarding post-exposure prophylaxis (PEP), in contrast to a conducted in Kuala Lumpur, Malaysia, where only 53.8% had heard about PEP.[9]

Regarding transmission risks, 99% of participants correctly recognized needle-stick injury as a mode of transmission for HIV/AIDS, 84% for hepatitis B virus (HBV), and 33% for hepatitis C virus (HCV). Comparable findings were noted in a study by J. Gogoi et al., where 100% of nurses identified HIV transmission risk and 98.9% identified HBV transmission risk following NSI.[8]

Despite regulations prohibiting unsafe injection practices, including needle recapping, as per the Occupational Safety and Health Administration (OSHA) Bloodborne Pathogen Standards (United States), the practice of recapping needles remains prevalent and has been reported at alarmingly high rates in numerous studies.[10,11] In our study also although 59% had Knowledge that used needles should not be recapped, 40% of them still practised recapping of needles.

In the current study, among the 86 respondents who knew that hepatitis B vaccination provides protection against HBV infection, only 45% had completed the full three-dose vaccination schedule. This figure is significantly lower than that reported by Priyanka et al., where 85.7% of nurses had received all three doses of the hepatitis B vaccine.[12] This finding could be attributed to inadequate knowledge about PEP among the study participants. Similarly, a study conducted by G.K. Joardar revealed that only 5% of nurses who had sustained NSIs had received hepatitis B vaccination.[13]

Our study found that 39% of the participants reported a history of exposure to NSI in the past year. The majority (49%) sustained injuries during the morning shift, and 95% of injuries occurred during the act of needle recapping. The most frequently cited reasons for NSIs were heavy workload and tiredness (67%). Post-exposure management practices were suboptimal: only 32% of the exposed individuals-initiated PEP following NSI. The most common immediate action was washing the injured site with soap and water (78%), and only 32% reported the NSI to the healthcare facility authority.

In a comparable study by Jahangiri M. et al., the majority of NSIs (57.8%) occurred during the morning shift, with recapping being the leading cause (41.4%). Washing the site with soap and water (70.2%) was the most common immediate response. [14] In another study by Laishram et al., the prevalence of NSI within the last year was 28.1%. Most injuries occurred during intravenous (53.5%) and intramuscular (16.3%) injections or blood withdrawal (15.1%). Immediate washing with soap and water was performed by 46.5% of participants, 43% did not report the injury, and only 5.7% initiated PEP. [2]

Sharma R reported that 79.5% of healthcare workers had experienced at least one NSI in their careers, with fatigue identified as a contributing factor in 50.4% of cases. Recapping was responsible for 34.0% of the injuries.[5] Similarly, a study by Muralidhar S. demonstrated that the most common activity leading to NSIs was blood withdrawal (55%), followed by suturing (20.3%). [4] Wilburn SQ and Osborn S.H.G report that approximately 40% to 70% of needle-stick injuries in healthcare settings remain unreported.[15, 16] Various studies have identified needle recapping as a significant contributor to the occurrence of needle-stick injuries.[17,18,19,20,21] Extended durations of clinical duty have been associated with an increased risk of needle-stick injuries, as identified in various studies. [22,23]

CONCLUSION

The present study brings to light, the knowledge, attitude and practice of the nursing staff of Jorhat Medical College and Hospital regarding Needle Stick Injury. Needle stick injuries are a serious matter of concern. There was a wide gap in the participants' knowledge and attitude towards NSI and what they actually did after sustaining the injury. The results of the study were intimated to the hospital authorities and they were recommended to address this issue with particular attention. They were advised to formulate strategies not just to create awareness but also to increase the adherence of nurses to standard precautions.

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