Knowledge, Attitude and Practice Regarding Needle-Stick Injuries among Nursing Staff in a Tertiary Care Hospital, Mangalore, India

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ABSTRACT

BACKGROUND

Health care workers are more prone to occupational hazards, like needlestick injuries, blood, and body fluid exposures. Needlestick injuries (NSI) are responsible for the transmission of serious infections like HIV, HBV and HCV. The occurrence of needlestick injuries is highest among the nurses. The objective of the study was to assess the knowledge, attitude and practice regarding needlestick injuries among nursing faculty in Justice K. S. Hegde Charitable Hospital, Mangalore.

METHODS

A cross-sectional survey was conducted among the nursing faculty working in a tertiary care hospital based on a structured questionnaire, and the obtained data were further analysed statistically.

RESULTS

The percentage of needle stick injury was 13.3 % among 75 nursing faculty. 94.7 % of the nurses were aware of the universal precaution guidelines and 84 % knew about post-exposure prophylaxis (PEP). 36 % of nurses knew the preventive guidelines' full details, but 50.7 % of the nurses were unaware of it. Many participants were aware that NSI transmits HIV (92 %) and Hepatitis B (68 %). The leading cause of NSI might be heavy work (54.7 %) followed by hurried procedures (41.3 %). 29.3 % of the nurses were still inclined to recapping the needle after use. 68 % of the nurses were mindful of washing hands with only water post exposure. 28 % were not willing to report a NSI. 80 % of nurses were fully immunised against Hepatitis B.

CONCLUSIONS

The best way to reduce NSI is to impart knowledge and awareness to the faculty. Our study showed that the knowledge, attitude, and practice among the nursing faculty were promising but requires to be further strengthened.

KEY WORDS

Needlestick Injury, Nursing Staff, Knowledge, Attitude, Practice

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DOI: 10.14260/jemds/2021/468

How to Cite This Article:
Khelgi A, Raj R, Reji R, et al. Knowledge, attitude and practice regarding needlestick injuries among nursing staff in a tertiary care hospital, Mangalore, India. J Evolution Med Dent Sci 2021;10(30):2290-2293, DOI: 10.14260/jemds/2021/468

Submission 20-03-2021,
Peer Review 23-05-2021,
Acceptance 31-05-2021,
Published 26-07-2021.

BACKGROUND

Needlestick injury (NSI) means penetrating stab wound, introducing blood or other potentially hazardous material into the body of healthcare worker (HCW), during the performance of their duties, by a hollow bore needle or sharp instruments including needles, lancets, scalpels.[1] World Health Report 2002 states that 2 million people experience percutaneous exposure to infectious diseases each year among the 35 million healthcare workers.[2] NSIs among HCWs are associated with various health hazards; the potential high-risk pathogens are the Human immunodeficiency virus (HIV), Hepatitis B (HBV) and Hepatitis C (HCV). World Health Report 2002 also noted that 37.6 % of Hepatitis B, 39 % of Hepatitis C and 4.4 % of HIV / AIDS in health care workers worldwide were due to needlestick injuries.[2] Many studies worldwide have shown that more than 35 million HCWs are facing percutaneous injuries with contaminated sharps every year.[3] In India, around 3 – 6 billion injections are given per year, of which two‑third injections are unsafe (62.9 %), and the use of glass syringe is constantly associated with a higher degree of unsafeness.[4]

Health care workers are at increased risk of acquiring blood-borne infections as they are occupationally exposed to blood and body fluids. Nurses are potentially exposed to infectious materials such as blood, body fluids, tissue, medical equipment or environmental surfaces contaminated with these substances in their workplace. They are frequently exposed to occupational hazards such as needle stick injuries, sharps injury, contact with the mucous membrane of an infected person's eyes or mouth, contact with non-intact skin exposed with blood or other potentially infectious body fluids. Nurses have been found with more needlestick injury rates among health care workers[5] as they are the primary contacts with patients in a medical care setting. The lack of knowledge about NSIs and awareness of preventive measures might be one of the reasons for a higher rate of NSIs among them.

An effective infection control program requires information on occupational exposure and prevalence of the disease and its factors. Such data helps in developing and revising infection control policies and procedures.[6] There is a need for such data in our institute to strengthen the infection control and prevention program. Hence, this study was done to determine the prevalence of NSIs and assess the knowledge, attitude, and practice among nursing faculty regarding NSIs in our tertiary care hospital located in Mangalore, Karnataka.

METHODS

This study was a cross-sectional survey conducted among the nursing faculty of Justice K. S. Hegde Charitable Hospital, Mangalore from April to September 2018. Institutional ethics committee clearance was obtained. The study population constituted staff nurses of the hospital who were actively involved in patient care. With reference to a previous study[7] having a prevalence of NSI as 74 % with 10 % absolute precision & 95 % confidence level, Sample size was calculated as 74. A convenience sampling technique was done. A total of 75 nursing faculty had given consent to be part of the study. They were informed about the design and purpose of our research. The confidentiality of the participants was maintained strictly.

Data was collected using a prevalidated, structured and guided interview - based questionnaire consisting of closed and open-ended questions. A researcher was present during the survey to answer queries raised by respondents. The questionnaire included a section on demographic items such as age, gender, and work experience. Another part collected data about their vaccination status, knowledge and occurrence of NSIs, the reasons for not reporting an NSI if there was one, knowledge and practice of universal precaution guidelines, and knowledge about post exposure prophylaxis (PEP).

Statistical Analysis

The data collected was recorded and entered in an MS Excel master sheet. Data obtained were tabulated and analysed using MS Excel and SPSS version 22. Categorical data were presented as frequency and percentage. Qualitative variables were analysed using Fisher exact tests, and a P - value of < 0.05 was considered significant.

RESULTS

All the 75 nurses included in the study were females. The mean age of the study subjects was 29.74 years (minimum age 20 years, maximum age 55 years). 10 (13.3 %) nurses among them experienced a needle stick injury.

Work Experience	Number of Nurses (%)	NSIs
0 - 10yrs	62(82.6)	9
11 - 20yrs	8(10.6)	1
21 - 30yrs	5(6.6)	0
Total	**75 (100)**	**10**

Table 1. Work Experience of the Nursing Staff and the NSIs among Them

(Fisher exact test – $P > 0.05$)

Table 1 shows the work experience of the nurses included in the study population and the occurrence of NSIs in each age group. The majority of the nurses (82 %) were having work experience of lesser than ten years, and similarly, the number of needle stick injuries (09) was also more among this group, but it was not statistically significant. ($P > 0.05$)

Table 2 shows the knowledge of the nurses about NSI. 94.7 % of the nurses were aware of the universal precaution guidelines, and 84 % knew about post-exposure prophylaxis (PEP). 68 % of the nurses were aware of washing hands with only water post exposure, but 5.3 % thought that finger needed squeezing. 36 % of nurses knew the full details of the preventive guidelines, but 50.7 % of the nurses were unaware of preventive guidelines. Only 45.3 % of the nurses knew the possibility of transmitting all three infections, i.e., HIV, HBV & HCV, by NSI. A large number of participants were aware that HIV (92 %) and Hepatitis B (68 %) were transmitted by NSI, although only 42.7 % of participants knew that NSI transmitted Hepatitis C as well.

Table 3 shows the attitude and practices of nurses regarding NSI. 85.3 % of the nurses had received formal training regarding proper handling of sharps. 86.7 % used gloves as PPE while using a needle. Usage of trays to keep the sharps during procedures were seen in 96 % of the nurses. 29.3 % of the nurses still thought of recapping the needle after

use. The needle stick injuries were seen in 13.3 % of nurses. According to them, the leading cause of NSI was heavy work (54.7 %) followed by hurried procedure (41.3 %). Even though 92 % thought that NSI needs to be reported, when asked whether they would report it, 28 % responded negatively. When asked why they did not want to report, 40 % of the nurses told NSIs due to sterile needles need not be informed, 29.3 % thought reporting was not essential, and 26.7 % said lack of time. 80 % of the nurses were vaccinated with all the three doses of the hepatitis B vaccine, and 17.3 % had received at least one dose of the hepatitis B vaccine.

Sl. No.	Questions	Yes N (%)	No N (%)
1	Do you know about universal precaution guidelines?	71(94.7)	4 (5.3)
2	Do you know about post - exposure prophylaxis (PEP)	63(84)	12 (16)
		Options	Response n (%)
3	What are the post-exposure measures to be taken?	Squeeze finger	4 (5.3)
		Nothing	1 (1.3)
		Wash with water	51 (68)
		Wash with soap & water	17 (22.7)
		Apply antiseptic / spirit	2 (2.7)
4	Awareness of any preventive guidelines	Know full details about them	27 (36)
		Know some details about them	6 (8)
		Only heard about them but don't know the details	4 (5.3)
		Have not heard about them at all	38 (50.7)
5	Infections transmitted by NSI	Hepatitis B	51 (68)
		Hepatitis C	32 (42.7)
		HIV	69 (92)
		All three	34 (45.3)
		None	2 (2.7)

Table 2. Nurse's Knowledge Regarding Needlestick Injury

Sl. No.	Questions	Yes N (%)	No N (%)
1	Did you receive sharps related training?	64 (85.3)	11 (14.7)
2	Do you wear gloves while using a needle?	65 (86.7)	10 (13.3)
3	Do you regularly use a tray to keep syringes?	72 (96)	3 (4)
4	Should the needle be recapped after use?	22 (29.3)	53 (70.7)
5	Any needlestick injuries to you?	10 (13.3)	65 (86.7)
6	The leading cause of the injury		
	i)Heavy work	41 (54.7)	34 (45.3)
	ii)Hurried procedure	31 (41.3)	44 (58.7)
	iii)Lack of preventive measures	14 (18.7)	61 (81.3)
	iv) Lack of assistance	8 (10.7)	67 (89.3)
7	Needles stick injuries needs to be reported?	69 (92)	6 (8)
8	Will you report NSI?	54 (72)	21 (28)
9	Reasons for not reporting	Response n (%)	
	Do not think it is important	22 (29.3)	
	Do not have time	20 (26.7)	
	Injury due to sterile needle	30 (40)	
	Do not know the reporting procedure	2 (2.7)	
	Will get blamed or get in trouble	1 (1.3)	
10	Hepatitis B vaccination status	Response n (%)	
	Received only one dose of the hepatitis B vaccination	13 (17.3)	
	Received all three doses of hepatitis B vaccination	60 (80)	
	Got antibody titres checked after vaccination	1 (1.3)	
	Did not receive Hepatitis B vaccine	1 (1.3)	

Table 3. Nurse's Attitude and Practice Regarding Needlestick Injuries

	Awareness of Any Preventive Guidelines			
Formal Training	Know Fully	Do Not Know Fully	Do Not Know	Total
Received	27	9	28	64
Not received	0	1	10	11
Total	**27**	**10**	**38**	**75**

Table 4. Nurse's Awareness of Preventive Guidelines for NSI after Formal Training

(Fisher exact test $p = 0.007$)

Table 4 shows the awareness regarding the preventive guidelines for NSI after formal training. Even though 85.3 % of the nurses received training, 50.7 % were unaware of such policies, showing a statistical significance with a P - value of 0.007.

DISCUSSION

Occupational exposure and hazards constitute a significant concern worldwide, more so in a developing country like India. The medical faculty has constantly ignored the importance of occupational health and safety and disaster management in teaching, training and epidemiological research. Nurses have been the significant faction among the medical fraternity to experience a needle stick injury.[5] In the present study, the prevalence of needlestick injuries among the nursing staff in the tertiary care hospital was 13.3 %. Data from the EPINet system suggests that health care workers incur approximately 30 needlestick injuries per 100 beds each year. In a study,[8] 36 % of health care workers had a history of needle stick injury. In their research, Gupta D et al.[9] found NSIs among 69 % of the nurses, which constituted 42 % of nursing staff and rest were nursing students.

The significant population of nursing faculty in most healthcare facilities comprised younger nurses, as seen in many studies.[8,10] A similar observation was seen in our study where 82 % of the nurses had work experience of less than ten years. The knowledge regarding the universal precautions and post exposure prophylaxis was about 94.7 % and 84 %, respectively, among the nurses of our institute, which is a good observation when compared to studies like Gurubacharya DL et al. where the knowledge regarding universal precaution was found to be 66 %[7] and Gupta et al. where it was 42.5 %.[9] This knowledge is essential for a health care professional. It was evident in their practice as 86.7 % of our hospital nurses used gloves, and 96 % used sharp trays to keep syringes and needles while handling sharps during any procedures. Such practice was poorly observed in several other studies.[7,9,11] Good knowledge and practice may be the reasons for less occurrence of NSIs noted in our study than others.

The responses to post exposure measure were varied, with 68 % of the participants said washing with water, and 22.7 % said washing with soap & water. Similar responses were observed in the study by Sharma et al.[11] Healthcare personnel should be aware of the infections which can be acquired after occupational exposure. In this study, though many participants were aware that NSI transmits HIV (92 %) and Hepatitis B (68 %), only 42.7 % of participants knew that Hepatitis C could also be transmitted. Similar observations were seen in the study by Gupta et al.[10] The majority of participants (54.7 %) believed that substantial work is the leading cause of NSI, as seen in another study by Sharma et al.[12] with 50.4 %. Other reasons included hurried procedure (41.3 %), lack of preventive measures (18.7 %), which are in concurrence with other studies.[9,12]

In the present survey, 29.3 % of the participants practised recapping the needle after use. Recapping has been noted as a leading cause of NSIs in several studies,[7,8,9,11,12] like in a survey by Anupriya A et al.[12] recapping was done in 60.9 % of NSI. According to the occupation safety and health administration (OSHA) bloodborne pathogen standard, needle recapping is strictly not advised.[13] In our study, though 92 % of the subjects thought that NSIs should be reported, 28 % were not ready to

inform it. Underreporting of needlestick injuries is a common problem. In a study conducted in Massachusetts, half of all occupational NSI's were not reported;[14] a similar observation was seen by Gupta et al.[9]

80 % of the participants had taken all three doses and 17.3 % received at least one dose of Hepatitis B vaccination as a result of a free compulsory vaccination programme for all healthcare workers conducted by hospital management. Vaccination among healthcare professionals against Hepatitis B as pre-exposure prophylaxis has been seriously considered in several hospitals.[10,15] However, only 1.3 % have got their antibody titers checked after vaccination, which is poor compared to other studies,[7,8] ranging from 14 % to 18 %.

Sixty - four nurses in our hospital received formal training regarding sharp handling and infection prevention and control practices. It was surprising to know that even after that, at the time of study 50. 7 % of the nurses were unaware of preventive guidelines laid down by the hospital's infection control committee. This emphasizes that the training needs to be reinforced regularly as the nursing population changes and newer and younger nurses join the facility.

CONCLUSIONS

Needlestick injuries represent a severe occupational hazard that health care workers in hospitals face daily. The best way to reduce NSI is to impart knowledge and awareness about it. Our study showed that the nursing faculty's knowledge, attitude and practice are promising but requires to be strengthened. Reporting of sharp injuries, preventive measures and post exposure prophylaxis and follow up should be the core issues to be addressed as a part of Infection prevention and control training to all HCWs. The management should plan these as an ongoing activity in the hospital. Since this study included only a few participants, a further continuation of such surveillance activity will give a better picture.

Data sharing statement provided by the authors is available with the full text of this article at jemds.com.
Financial or other competing interests: None.
Disclosure forms provided by the authors are available with the full text of this article at jemds.com.
We are grateful to the participants and the tertiary care hospital's management authority for their kind cooperation towards the study.

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