

Assessment of knowledge regarding needle stick injury among health care workers in tertiary care hospital

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Abstract

Background: Needle-stick and sharp injuries present the single greatest occupational hazard to Health Care Workers(HCWs). There are more than 20 blood-borne diseases, but those of primary significance to HCWs are hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) infections. Needle Stick Injuries (NSIs) have been neglected and most go unreported.

Methodology: A cross-sectional study was conducted among 400 HCWs of two tertiary care hospitals. Data was collected from study participant using a pretested and predesigned questionnaire, which included socio demographic profile and knowledge regarding needle stick injury. Statistical analysis was done using Chi square test and 'p' value less than 0.05 was considered significant.

Results: Out of the total 400 study participants, maximum 314 (78.5%) were in the age group of 21-30 years and 247(61.7%) of the HCWs were female. Regarding distribution of study participants by religion 319(79.8%) were Hindu. About 237(59.2%) were staff nurse and 176(44.0%) had completed A.N.M/G.N.M courses, followed by 82(20.5%) who had completed B.Sc Nursing. Most of them 307(76.8%) were having 0-5 years of work experience. The mean(\pm standard deviation) knowledge score of HCWs regarding needle-stick injuries was 6.8 \pm 1.52 and 268(67.0%) study participants had average knowledge score.

Conclusion: The participants had average knowledge score regarding NSI whereas poor and good knowledge score were similarly distributed among HCWs.

Keywords: Needle stick injury, Health care workers, Post exposure prophylaxis

Introduction

Needle-stick and sharp injuries present a single greatest occupational hazard to Health Care Workers(HCWs). There are more than 20 blood-borne diseases, but those of primary significance to HCWs are the hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) infections. Needle Stick Injuries (NSIs) have been neglected, most go unreported and the International Classification of Diseases -10 coding is not available.⁽¹⁾

Globally thousands of HCWs suffer accidental NSI during their role of caring for patients. These injuries can result in a variety of serious and distressing consequence ranging from extreme anxiety to chronic illness and premature death. Blood borne exposures encountered can be career and life-ending.⁽²⁾ The authentic data on NSIs is very less. It is known that around 3-6 billion injections are given per year, of which two-third injections are unsafe (62.9%).⁽³⁾

Annually about 16 million injections are administered, in developing and transitional nations and approximately 3 million individuals are injured due to NSSI(Needle stick and subcutaneous Injury).⁽⁴⁾ In developing countries like Ghana, Indonesia and Uganda, 80-90% of patients who visited a health centre received one or more injections per visit.⁽⁵⁾ In a country like India, in spite of large number of awareness programmes, it is not possible to estimate the annual incidence of NSI in different occupations because of the scarcity of data.⁽⁶⁾

The World Health Report 2002 estimates that 2.5% of HIV, 40% of HBV and HCV cases among HCWs worldwide are the result of occupational exposures. Considering the seriousness of the issue and as no studies have been done in this part of Karnataka in relation to needle-stick injuries among the health care workers, so the present study aims to assess the knowledge regarding needle-stick and sharp injuries among the health care workers of a tertiary care hospital.

Materials and Methods

Source of the study, sampling procedure and Data collection: This was a cross sectional study and the study population included Doctors, Staff Nurse, Nursing intern, Laboratory technicians and Health assistant working in two tertiary care hospitals of Belagavi. Sample size was calculated using the formula $n = 4pq/d^2$ where p was 50% i.e. awareness about NSI among HCWs. So the sample size was 400.

Using simple random sampling method 400 HCWs were selected proportionate to their designation. Data collection involved interview method using the pre-designed and pre tested questionnaire.

Knowledge score regarding NSI: There were total nine questions pertaining to knowledge regarding NSI. For every correct answer one mark was given and wrong answer was considered as zero. Knowledge score was further divided according to marks scored by each participant.

Poor knowledge score: Below (mean - SD)

Average knowledge score: (Mean - SD) to (Mean + SD)

Good knowledge score: Above (Mean + SD)

Needle stick injury was defined as 'any cut or prick to respondents by a needle previously used on a patient and sustained within the hospital premises

Ethical clearance: Ethical clearance was obtained from Institutional Ethical and Research Committee and informed consent was obtained from the study participants.

Data analysis: Collected data was analyzed using the statistical package for social sciences (SPSS) version 20. Frequency and percentage were used to analyze the knowledge regarding needle stick injury among HCWs. Chi-square test was used to find the association between socio- demographic variables and knowledge score regarding NSI

Results

The present study showed that out of the total 400 study participants, maximum 314 (78.5%) were in the age group of 21-30 years and 247(61.7%) of the HCWs were female. Regarding distribution of study participants by religion 319(79.8%) were Hindu. About 237(59.2%) were staff nurse and 176(44.0%) had completed A.N.M (Auxillary Nurse Midwifery)/ G.N.M(General Nursing Midwife) courses, followed by 82(20.5%) who had completed B.Sc Nursing. Most of them 307(76.8%) were having 0-5 years of work experience.

The mean \pm standard deviation knowledge score of HCWs regarding needle-stick injuries was 6.8 ± 1.52 and 268(67.0%) study participants had average knowledge score. Out of 400 study participants, 319(79.8%) correctly knew that after needle stick injury it should be washed with soap and water whereas other participants had wrong knowledge. Majority 342(85.5%) knew about universal precaution guidelines. Regarding HBV and HIV transmission by NSI, 361(90.3%) answered that there is more possibility of HBV transmission than HIV by NSI. Regarding rate of disease transmission 194(48.3%) and 179 (45.0%) participants had correct knowledge about HIV and HBV transmission respectively. Result concerned to time taken to report NSI 266(66.5%) mentioned that it should be reported within two hours whereas 127(31.8%) mentioned within twenty-four hours and remaining mentioned within 48 or 72 hours. Every participant knew that HIV, HBV, HCV can be transmitted by NSI.(Table 1, 2)

Table 1: Distribution of study participants according to knowledge regarding needle stick injuries

Knowledge regarding NSI	Number	Percentage
What should be done after NSI		
squeeze the blood out	54	13.5

apply spirit	17	4.3
wash with soap and water	319	79.8
do nothing	3	0.8
squeeze the blood out and wash with soap and water	7	1.6
Is there more possibility of HBV transmission than HIV by NSI		
Yes	361	90.3
No	39	9.7
Do you know Universal Precaution Guidelines		
Yes	342	85.5
No	58	14.5
Rate of HIV transmission by NSI		
0.3%	194	48.3
3%	84	21.1
5%	122	30.6
Rate of HBV transmission by NSI		
0.3%	68	16.6
3%	153	38.4
5%	179	45.0
Total	400	100

Table 2: Distribution of study participants according to knowledge regarding needle stick injuries

Knowledge regarding NSI	Number	Percentage
HCV can be transmitted by NSI		
Yes	323	80.6
No	77	19.4
Whom do you report needle stick injuries		
Infection control committee	334	83.5
Friend	1	0.2
Senior Consultant	30	7.5
Head of department	17	4.3
Nursing superintendent	18	4.5
Reporting NSI to concerned authority within how many hours		
2 hours	266	66.5
24 hours	127	31.7
48 hours	5	1.3
72 hours	2	0.5
Which infections are transmitted through NSI(HIV, HBV and HCV)		
One infection	205	51.3
Two infection	54	13.5
Three infection	141	35.2
Total	400	100

Good knowledge score was seen more 23 (31.5%) among the study participants of age ≥ 31 years, average knowledge score was highest 238 (75.8%) among 21-30 years and poor knowledge score was seen among 9(69.2%)

HCWs who were aged ≤ 20 years. So as the age of the participant increased the knowledge score also increased. This difference was statistically significant with $p < 0.001$. Good knowledge score regarding NSI was highest 27(39.2%) among doctors as compared to other HCWs. Majority 180(75.9%) staff nurse had average knowledge score and poor knowledge score was highest 8(38.1%) among nursing intern followed by health assistants. This difference was statistically significant ($p = 0.000$).

In the present study as the work experience increased knowledge regarding needle stick decreased. Among total 400 study participants, good knowledge score was seen among 26(34.2%) study participants who had 6-10 years of work experience, the average knowledge score was highest 222(72.3%) among participants having 0-5 years work experience. This association was statistically significant ($p < 0.001$). (Table 3, 4)

Table 3: Association between age of study participants and knowledge score regarding NSI

Age(in years)	Knowledge score								$\chi^2 = 63.562$ df= 4 $p < 0.001$
	Poor		Average		Good		Total		
	No	%	No	%	No	%	No	%	
≤ 20	9	69.2	2	15.4	2	15.4	13	100	
21-30	47	15.0	238	75.8	29	9.2	314	100	
≥ 31	22	30.1	28	38.4	23	31.5	73	100	

Table 4: Association between work experience and designation of study participants and knowledge score regarding NSI

Work Experience (in years)	Knowledge score								$\chi^2 = 43.385$ df=4 $p < 0.001$
	Poor		Average		Good		Total		
	No	%	No	%	No	%	No	%	
0-5	57	18.6	222	72.3	28	9.1	307	100	
6-10	13	17.1	37	48.7	26	34.2	76	100	
More than 10	8	47.1	9	52.9	0	0	17	100	

Designation									$\chi^2 = 84.865$ df=8 $p = 0.000$
Staff Nurse	47	19.8	180	75.9	10	4.3	237	100	
Doctor	3	4.3	39	56.5	27	39.2	69	100	
Laboratory technician	13	25.0	27	51.9	12	23.1	52	100	
Nursing Intern	8	38.1	8	38.1	5	23.8	21	100	
Health assistant	7	33.3	14	66.7	0	0	21	100	

Discussion

In the present study 319(79.8%) study participants correctly knew that after NSI it should be washed with soap and water and majority 342(85.5%) knew about universal precaution guidelines. Regarding HBV and HIV transmission by NSI, 361(90.3%) answered that there is more possibility of HBV transmission than HIV by NSI. Regarding rate of disease transmission 194(48.3%) and 179(45.0%) participants had correct knowledge about HIV and HBV transmission respectively. Majority 323(80.6%) participants also knew that HCV is transmitted by NSI and 334(83.4%) correctly knew whom to report in case of NSI. Regarding time taken to report NSI 266(66.5%) mentioned that it should be reported within two hours. Every participant knew that HIV, HBV and HCV can be transmitted by NSI.

In a study conducted in G.B Pant hospital New Delhi majority doctors 86(83.5%) and nurses 80(90.9%) correctly knew what should be done after NSI. Regarding HBV and HIV transmission by NSI, 208(76.2%) had answered that there is more possibility of HBV transmission than HIV by NSI. Regarding rate

of HIV and HBV transmission owing to NSI, 69(25.3%) participants had correct knowledge. Majority 208(76.2%) participants knew that HCV is transmitted by NSI and 194(71.1%) participants correctly knew to which department NSI should be reported.⁽⁷⁾ In, another study conducted in a tertiary care cardiac hospital, majority 180(94.7%) participants knew about universal precaution guidelines and 146(76.8%) mentioned that they would contact infection control nurse if they had NSI.⁽⁹⁾

In the present study the mean \pm standard deviation knowledge score of HCWs regarding needle-stick injuries was 6.8 ± 1.52 and the study findings also revealed that 268 (67.0%) of study participants had average knowledge score, 78(19.5%) poor knowledge score and 54(13.5%) had good knowledge score. In a study conducted in G.B Pant hospital New Delhi the mean (\pm standard deviation) knowledge score for HCWs regarding NSI was 6.56 ± 2.74 .⁽⁷⁾

Conclusion

Overall the participants had average knowledge score regarding NSI whereas poor and good knowledge score were similarly distributed among HCWs.

Limitation

The selection of hospitals was purposive.

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Further Implication

Further study can be conducted using in-depth interview to explore the factors influencing poor knowledge among HCWs regarding needle stick injuries.

Conflict of Interest

Nil

References

1. Rampal L, Zachariah R. Needle stick and sharp injuries and Factors associated among HCWs in a Malaysian Hospital. *Eur J Soc Sci.* 2010;13:354-62.
2. Susan Q, Wilburn, Eijkemans G. Preventing needle stick injuries among health care workers. *International Journal of Occupational and Environmental Health* 2004;13:356-60.
3. Kermode M, Muani V. Injection practices in the formal and informal healthcare sectors in rural north India. *Indian J Med Res.* 2006;124:513-20.
4. Injection safety. World Health Organization. Geneva (accessed on 17/10/2015). Available at www.who.int/factsheets/fs231/en
5. Murlidhar P, Pandey K. Injection practices in the formal and informal healthcare sectors in rural north India. *Indian J Med Res.* 2006;124:513-20.
6. Jayanth ST, Kirupakaran H, Brahmadathan KN, Gnanaraj L, Kang G. Needle stick injuries in a tertiary care hospital. *Indian J Med Microbiol.* 2009;27:44-7.
7. Bhargava A, Mishra B, Thakur A, Dogra V, Loomba P, Gupta S. Assessment of knowledge, attitude and practices among health care workers in a tertiary care hospital on needle stick injury. *International Journal of Health care Quality Assurance* 2013;26(6):549-58.
8. Shah R, Mehta HK, Fancy M, Nayak S, Donga BN. Knowledge and Awareness Regarding Needle Stick Injuries Among Health Care Workers in Tertiary Care Hospital in Ahmedabad, Gujarat. *National Journal of Community Medicine* 2010;1(2):93-96
9. Sharma S, Gupta A, Arora A. Knowledge, attitude and practices on needle-stick and sharps injuries in tertiary care cardiac hospital: A survey. *Indian Journal of Medical Sciences* 2010;64(9):396-4.