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Original Research Article

Burden of needle stick injuries among healthcare workers in primary health centers of Mandya district, Karnataka

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ABSTRACT

Background: Needle stick injuries (NSIs) are wounds caused by sharps such as hypodermic needles, blood collection needles, intravenous cannulas or needles. The health care workers (HCW's) are at an increased risk of accidental needle stick and sharps injuries, because of the environment in which they work. About 30 diseases like hepatitis B, hepatitis C, HIV can be transmitted by NSI. The incidence of NSI is considerably higher than current estimates, due to gross under-reporting. The objectives of present study was to determine the burden of NSIs among various categories of health care workers (HCWs) at primary health centres (PHC's) of Mandya district, to determine the factors influencing NSIs and to assess awareness regarding NSIs among various categories of HCWs.
Methods: This cross-sectional study was conducted at PHC's of Mandya district for a period of 6 months. Interview method was used to collect information regarding socio demographic details, occurrence of NSI, factors influencing NSI and awareness regarding NSI by using a pretested semi-structured questionnaire on HCWs.
Results: Of the 621 HCWs working during the study period, 366 participated in the study. 93 (25.41%) of the HCWs had at least one episode of NSI in the past 1 year. The common category of HCWs who experienced NSI was the medical officers 39 (41.94%). Majority 48 (51.61%) of NSI's occurred while vaccine/drug administration followed by withdrawing of drug from the bottle 23 (24.73%). The medical officers and staff nurses had better knowledge regarding the diseases spread through NSI.
Conclusions: Among the HCW's, doctors and nurses are more prone for NSI. Vaccine/drug administration and withdrawing of drug from the bottle are circumstances where NSIs commonly occur hence education regarding safe injection practices are necessary.

Keywords: Primary health centers, Health care workers, Needle stick injury

INTRODUCTION

Needle stick injuries (NSIs) as defined by the United States National Institute of Occupational Safety and Health are injuries caused by needles such as hypodermic needles, blood collection needles, intravenous (IV) stylets, and needles used to connect parts of IV delivery systems.[1] A sharps injury is a penetrating stab wound from a needle, scalpel, or other sharp object that may result in exposure to blood or other body fluids.[2] NSIs are common and to an extent inevitable in health-care workers (HCWs) during execution of their patient care services. Percutaneous exposure occurs as a result of a break in the skin caused by a needle stick or sharps contaminated with blood or body fluids. Mucocutaneous exposure occurs when body fluids come into contact with open wounds, non intact skin such as found in eczema, or mucous membranes such as the mouth and eyes.[3] HCWs are also exposed to droplets or splashes of blood, saliva, and urine. Percutaneous injury and splashes of fluids have been recognized as a source of exposure to blood-borne pathogens such as hepatitis B virus (HBV),

hepatitis C virus (HCV), and human immunodeficiency virus (HIV) for HCWs and responsible for a significant proportion of HBV, HCV, and HIV infections in this group.[4,5]

Needle stick injuries are an occupational hazard for millions of healthcare workers. Even though universal guidelines have decreased the risks of needle stick injuries over the past 30 years, these injuries continue to occur. Healthcare professionals at the highest risk for needle stick injuries are surgeons, emergency room workers, laboratory room professionals, and nurses. The use of needles is unavoidable in healthcare, and even though every hospital has guidelines on proper handling and disposal of needles and the newest design of safety conscious needles, needle stick injuries continue to occur. In most cases, needle stick injuries occur chiefly because of unsafe practices and gross negligence on the part of the healthcare workers. The reality is that most needle stick injuries are preventable by following established procedures.[6]

WHO reports in the World Health Report 2002, that of the 35 million health-care workers, 2 million experience percutaneous exposure to infectious diseases each year. It further notes that 37.6% of hepatitis B, 39% of hepatitis C and 4.4% of HIV/AIDS in Health-Care Workers around the world are due to needle stick injuries.[7]

The average percutaneous transmission rates for hepatitis B (HBV) and C (HCV) are 33.3 (6-33%) and 3.3 per cent (1-10%), respectively, while the sero conversion risk for HIV is 0.31 per cent.[8] The incidence of NSI is considerably higher than current estimates, due to gross under-reporting (often less than 50%).[9,10]

Preventing NSI is an essential part of any blood borne pathogen prevention programme in the work place. Every healthcare facility should have an infection control programme in place through a working hospital infection control committee. The present study addresses the important issue of NSI and aims at determining the occurrence of NSI among different categories of HCWs like medical officers, staff nurses, lab technicians, male and female health assistants, the circumstances under which these occur and the awareness regarding NSI.

METHODS

This cross-sectional study was conducted at primary health centers of Mandya district for a period of 6 months from 1st August 2018 to 31st January 2019 after getting approval from Institution Scientific Committee and District Health Office. Interview method was used to collect information regarding socio demographic details, occurrence of NSI, factors influencing NSI and awareness regarding NSI by using a pretested semi-structured questionnaire on HCWs. All the Health care Workers (HCW's) which includes medical officers, staff nurses, lab technicians, male and female health assistants were interviewed. Details of the primary health centres and total number of health care workers were collected from district health office, Mandya district. There were 115 medical officers, 49 staff nurses, 68 lab technicians, 261 female health assistants, 128 male health assistants were working during the study period. There were totally 621 HCW's taken for the study. Data were entered in Microsoft Excel and analysed using descriptive statistics by SPSS trial version.

Inclusion criteria

Inclusion criteria were those who gave consent for the study; those who were dealing with injections, deliveries and other activities involving needles in the last one year

Exclusion criteria

Exclusion criteria were those who were not available even after 2 visits.

RESULTS

Of the 621 HCW's working during the study period, 366 participated in the study. 180 were not at risk of exposure to NSI since they are not dealing with needles for past one year, 75 were unavailable even after 2 consecutive visits. There were 240 females and 126 males. The age range was between 25 years to 58 years. The work experience in healthcare field was between 3 months and 37 years (Table 1).

Table 1: Socio demographic characteristics of HCW's (n=366).

Socio demographic characteristics	Number (%)
Age (in years)	
20-29	57 (15.57)
30-39	136 (37.16)
40-49	147 (40.16)
>50	26 (7.11)
Sex	
Male	126 (34.43)
Female	240 (65.57)
Occupation	
Medical officers	93 (25.41)
Staff nurses	26 (7.11)
Lab technicians	48 (13.11)
Male health assistants	54 (14.75)
Female health assistants	145 (39.62)
Work experience	
≤12 months	10 (2.73)
13-60 months	116 (31.69)
61-120 months	97 (26.51)
≥121 months	143 (39.07)

Among 366 HCWs participated in the study, 93 (25.41%) of the HCWs had at least one episode of NSI in the past 1 year. The burden of NSI was more among medical officers (41.94%) followed by staff nurses (30.77%). 22.92% of lab technicians, 20.69% of female health assistants and 9.26% of male health assistants experienced at least one episode of NSI in the past one year (Table 2).

Table 2: Burden of NSI among HCW's.

Category of HCW's	Number	Number (%) of people who experienced NSI in past 1 year
Medical officers	93	39 (41.94)
Staff nurses	26	8 (30.77)
Lab technicians	48	11 (22.92)
Male health assistants	54	5 (9.26)
Female health assistants	145	30 (20.69)

Table 3: Circumstances of occurrence of NSI (n=93).

Circumstances of occurrence of NSI's	Number (%)
While drug/vaccine administration	48 (51.61)
While withdrawing drug from bottle	23 (24.73)
While recapping needle	10 (10.75)
While collecting blood	6 (6.45)
Taking needle from co worker	3 (3.23)
While removing the cap of needle	2 (2.15)
While conducting a procedure	1 (1.08)

Table 4: Knowledge regarding NSI.

Knowledge factor	Categories of HCW's	%
Common diseases which spread through NSI	Medical officers	93 (100)
	Staff nurses	26 (100)
	Lab technicians	46 (95.83)
	Female health assistants	125 (86.21)
	Male health assistants	46 (85.19)
Recapping of needle should not be done	Medical officers	70 (75.27)
	Staff nurses	17 (65.38)
	Lab technicians	30 (62.50)
	Female health assistants	88 (60.69)
	Male health assistants	31 (57.41)
Reporting of NSI	Medical officers	93 (100)
	Staff nurses	26 (100)
	Lab technicians	46 (95.83)
	Female health assistants	88 (60.69)
	Male health assistants	32 (59.26)

Majority (51.61%) of HCW's experienced NSI while drug/ vaccine administration. 24.73% of people experienced NSI while withdrawing drug from the bottle, 10.75% of people got prick while recapping needle. While collecting blood 6.45% experienced NSI, 3.23% got prick while collecting needle from co-worker (Table 3).

Regarding the common diseases (HIV, hepatitis B and C) which spread through NSI, majority of HCWs had better knowledge. Regarding recapping of needle, 75.27% of medical officers and 65.38% of staff nurses answered that recapping of needle should not be done. All medical officers and staff nurses aware that NSI should be reported (Table 4).

DISCUSSION

The present study had addressed certain aspects of NSI in Primary Health centres of Mandya district. In order to avoid the effects of recall bias, NSI was assessed in the past one year. It was found that 25% of HCW's had experienced at least one episode of NSI in the past one year. Whereas studies from New Delhi, India have shown relatively higher proportion of NSI among HCW's i.e., 79.5% and 80.1% respectively when compared to the present study findings.[11,12] In the study conducted in Nellore, Andhra Pradesh 10.81% of health care providers experienced NSI which is less than the present study.[13]

In the present study, medical officers and staff nurses have higher burden of NSI compared to other category of health care workers. Similar findings were reported in studies done in North India and Nigeria.[14,15]

In the present study, majority (51.61%) of HCW's experienced NSI while drug/vaccine administration. Next common cause of NSI was withdrawing of drug from the bottle (24.73%) and recapping of needle (10.75%). Whereas studies done by Muralidhar in New Delhi showed that withdrawing of blood was the commonest cause of NSI. (55%) and study by Sharma in Delhi showed most of the injuries (34%) occurred during recapping.[11,12]

In the present study regarding the common diseases (HIV, Hepatitis B and C) which spread through NSI, majority of HCWs had better knowledge, similar findings were reported by Muralidhar in his study in New Delhi.[11] In the present study, 236 (64.48%) answered that recapping of needle should not be done. Whereas study done in New Delhi revealed that 66.3% of HCW's had practice of recapping needles after using it.[11]

CONCLUSION

The NSI burden among HCW's in the past one year was 25%. Among the HCW's doctors and nurses are more prone for NSI. Vaccine/drug administration and withdrawing of drug from the bottle are circumstances where NSI commonly occur hence education regarding safe injection practices are necessary.

Recommendations

Adopting appropriate disposal of needles and ensuring safety during handling of biomedical waste could prevent more than half of injuries. Instructions regarding safe injection techniques should be placed in places like injection room, immunisation centre, wards etc. Simple steps like education regarding reporting of NSI and hepatitis B vaccination to all health care providers need to be emphasized on.

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