



Original Research Article

A CROSS-SECTIONAL STUDY ON OCCUPATIONAL INJURIES AMONG HEALTHCARE WORKERS IN TERTIARY CARE HOSPITAL IN TAMILNADU

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ABSTRACT

Background: Healthcare workers are at elevated risk of several diseases in comparison to other occupations since they are exposed to a variety of potentially harmful conditions. Many healthcare providers frequently overlook needle stick injuries, this route predominantly facilitates the transmission of severe blood-borne diseases such as Hepatitis B, Hepatitis C, and HIV, etc.;

Objectives: 1. To study the prevalence of occupational injuries among healthcare workers in tertiary care hospital in Tamil Nadu. 2. To explore the patterns of occupational injuries among healthcare workers.

Materials and Methods: A cross-sectional study was carried out among 200 healthcare workers in a Tertiary care hospital in Tamil Nadu. The participants were interviewed using a predesigned semi-structured questionnaire. Data was compiled in MS Excel and analyzed and analyzed using SPSS v25.0.

Results: The prevalence of occupational injuries among healthcare workers (N=200) was found to be 66%. Among all occupational injuries, needle stick injury was more common. The occupation and hours of shift (12 hrs) were found to be statistically significant with occupational injuries. Only 21.2% of injuries were reported. Injuries were more often during the morning shift inwards and while doing procedures.

Conclusion: The study shows a high prevalence of occupational injuries among doctors, the most common being needle stick injury, emphasizing the importance of implementing safe measures to handle sharps to prevent transmission of infection.

Keywords: Occupational injuries, Needle stick injury, Health care workers.

INTRODUCTION

Healthcare workers face a higher risk of contracting various diseases compared to individuals in other professions due to their exposure to a range of potentially hazardous conditions.^[1] They are not only at high risk of various infections but also of lifestyle diseases due to their stressful schedules and a high degree of professional responsibility.

According to the WHO, around 35.7 million healthcare professionals worldwide are at risk of needle stick injury. On a global scale, it is approximated that sharps injuries result in approximately 66,000 HBV, 16,000 HCV, and 200-5000 HIV infections among healthcare workers annually. Additionally, it was also reported that

every year, around 2 million of them get percutaneous exposure to infectious diseases.^[2,3]

Needle stick and sharp injuries (NSSI) frequently result in bleeding, tiny surface scratches, and minor visible skin injuries, but the main risk is the transfer of viral infections,^[4] DAĞCI2021. The degree of risk depend on the number of patients with that infection in the health care facility and the precautions that the HCWs (Health Care Workers) take when dealing with these patients.^[5]

There are more than 20 blood-borne diseases, but those of primary concern to healthcare professionals are hepatitis, caused by either the hepatitis B virus (HBV) or the hepatitis C virus (HCV), and acquired immunodeficiency syndrome (AIDS), caused by HIV.^[6] Ass per a recent study conducted by

Sardesai et al., around 40% of the infections are accounted for HBV and HCV along with 2-3% of HIV contamination (Sardesai 2018).

Many HCWs overlook needle stick injuries despite the fact that they are a common way for infectious diseases to spread. Even in situations where there was no transmission of a serious infection, needle stick injuries can have a profound and enduring emotional impact.^[7] Nearly 80% of needle stick injuries can be prevented by utilizing safer goods and effective safety procedures.^[8]

The evaluation of the necessity for post-exposure prophylaxis is sparked by NSSI reporting, which also enables early seroconversion detection and reduces worry. Injury reporting reduces the chance of more injuries by identifying potentially dangerous equipment or practices.^[9]

It was also proposed that every healthcare facility should maintain a registry of possible occupational exposures, and hospital staff members should be aware of what to do at situations in which they come into touch with potentially infectious materials. Any instance of such exposure should be reported to the infection control team or the doctor in charge of the PEP. Their job is to determine whether a blood-borne infection is possible and to take appropriate action based on the type of exposure.^[10]

The purpose of this study was to ascertain the frequency, trends, and reporting of work-related injuries in order to prevent their recurrence in the future.

MATERIALS AND METHODS

This cross-sectional study was done from June 2022 to August 2022 in a tertiary healthcare institution (ACS Medical College and Hospital) in Chennai, Tamil Nadu. All healthcare professionals (including physicians, nurses, laboratory technicians, and ward attendants) employed at the institution were chosen as participants for the study.

Based on the inclusion criteria, all the healthcare providers who had more than one year of experience in the relevant units were included in the study. Based on the literature review, the sample size was computed with the awareness level of occupational injuries, which was found to be 68.3% in the study done by Archana Lakshmi P.A et al,^[11] using the Cochran sample size method,

$N = \frac{4pq}{l^2}$,

With a 95% confidence interval and allowable error of 10%, the sample size was calculated as 200.

After obtaining the institutional ethics committee's approval, the participants were selected by a simple random sampling method according to the sample size calculated. Data was collected after explaining

the purpose of the research and getting informed consent, with a predesigned, semi-structured questionnaire consisting of demographic details, hours of work per day, place and modes of occupational injuries, etc. The collected data were analysed using SPSS version 25.

RESULTS

This study was carried out with 200 participants. Most of the participants (70%) were aged 26 to 35 years. There were 45% (89) doctors, 20% (40) nurses, 20% (40) technicians and 25% (13) ward attendees. The majority of them, 163 (81.5%), had 7 hours work shift per day. [Table 1]

Among 200 healthcare providers, 66% (132) had encountered occupational injury, out of which 92 healthcare providers had NSSI during their career. Out of 132 occupational injuries, a majority (75) were found among doctors.

The needle stick injury was the most common injury (64%), followed by glass items (25%) and venflon (15%). The majority of healthcare workers sustained an injury while performing medical procedures (62%), and hands being the most common site of injury (94%). A majority of them sustained injury in wards (25%) followed by casualty (22%). Among sharp injuries occurred, about 45% of the sharps were contaminated. [Table 2]

Half of the healthcare workers utilized only one pair of gloves during the injury incident. The majority (60%) of them had completed the full course of Hepatitis vaccination

Among healthcare professionals exposed to contaminated NSSI, 6% have been found to be infectious (HIV/HbsAg), while 44% were unaware of the patient's infectious status

for whom they were giving care. Among healthcare workers with occupational injury, it was found that only 21% have reported the injury to the concerned department. [Table 3]

Table 4 – When occupational injury and multiple variables were analysed, only profession, gender, and shift hours had statistically significant association.

The occupational injury was more prevalent among nurses compared to other profession and it was found to be statistically significant ($p = 0.029$). Females were more commonly injured compared to males which was found to have statistically significant association ($p = 0.000$).

The occupational injury was more common among healthcare workers working in 12 hours shift compared to 7 hours shift and this difference was found to be statistically significant ($p = 0.03$). [Table 4]

Table 1: Demographics (N=200)

VARIABLES		FREQUENCY (%)
Age	19-25	22 (11%)
	26-35	139 (69.5%)
	>45	39 (19.5%)

Gender	Male	100 (50%)
	Female	100 (50%)
Profession	Doctors	89 (44%)
	Nurses	40 (20%)
	Lab technicians	40 (20%)
	Ward attendees	31 (15%)
Shift hours	7 hours	163 (81.5%)
	12 hours	36 (18%)
	Others	1 (0.5%)

Table 2: Distribution of hazards of occupational injuries among study participants (N =132)

VARIABLES	FREQUENCY (PERCENTAGE)
Items that caused the injury.	
Needle	85 (64.5%)
Glass items	33 (25%)
Venflon	21 (15.9%)
Chemicals	12 (9.1%)
Others	19 (14.4%)
Circumstances leading to injury	
While doing procedure	83 (62.9%)
While recapping the syringe	49 (37.1%)
Disposing of sharps	24 (18.2%)
While transferring patients	1 (0.8%)
Others	15 (11.4%)
Place of injury	
Out Patient Department	21 (15.9%)
Operation theatre	23 (17.4%)
Intensive Care Unit	22 (16.7%)
Wards	33 (25%)
Casualty	29 (22%)
Others	28 (21.2%)
Status of sharp item	
Contaminated	60 (45.5%)
Uncontaminated	44 (33.3%)
Unknown	13 (9.8%)
Not applicable	15 (11.4%)
Site of injury	
Hands	125 (94%)
Legs	27 (20.3%)

Table 3: Distribution of PPE use, immunization status, infectious state, and reporting among study participants (N= 132)

VARIABLES	FREQUENCY (PERCENTAGE)
Personal protection at the time of injury	
Single pair of gloves	66 (50%)
Doble pair of gloves	13 (9.8%)
No gloves	53 (40.2%)
Hepatitis B Immunization status	
Completed course	80 (60.2%)
Incomplete course	40 (30.1%)
Not taken	13 (9.8%)
HIV/ HbsAg status of the patient at the time of injury	
Positive either for HIV or HBsAg	6 (4.5%)
Negative	54 (40.9%)
Unknown	48 (36.4%)
Not applicable	24 (18.2%)
Reporting of injury to the concerned department	
Reported	28 (21.4%)
Not reported	103 (78.6%)

Table 4: Association between occupational injuries and various factors

Variable	Category	Number (Percentage)		Chi-square value	P-value
		Yes	No		
Profession	Doctors	61 (68.5%)	28 (31.5%)	10.899	0.029 [#]
	Nurses	31 (77.5%)	9 (22.5%)		
	Technician	27 (67.5%)	13 (32.5%)		
	Ward attendees	11 (44%)	14 (56%)		
Gender	Male	52 (52%)	48 (48%)	17.469	0
	Female	80 (80%)	20 (20%)		
Hours of shift	7 hours	103 (63.2%)	60 (36.8%)	5.818	0.03 [#]

	12 hours	30 (81%)	7 (19%)		
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Percentage in brackets represent row tables

- Fisher's Exact Test

DISCUSSION

Understanding and addressing needle-stick and sharps injuries (NSSI) among healthcare workers is essential for societal well-being. In addition to endangering immediate health, NSSI promotes the spread of potentially fatal illnesses (Sharma 2020). In order to promote workplace safety, develop a culture of best practices in healthcare settings, and guide targeted interventions and legislation, studies on the prevalence and prevention of NSSIs are essential.

In the present study, 66% had an occupational injury during their career, which was comparable with a report of Archana et al,^[11] (68.3 %). In this study, the rate of NSSI was 69.7%, aligning with the findings of Kebede et al., who reported a prevalence of 30.8%. NSSI was more among the doctors (64%) which was similar to the study done by Varun Goelet al.^[13]

The majority of participants sustained injuries while performing procedures (76, 58%). The most common item responsible for injury was the hypodermic needle (84, 64.1%), which is in line with findings from the study conducted by Bhattaraiet al.^[14] The most common type of injuries from needle sticks and sharp objects is hypodermic needle injury (Bouya 2020). Their frequency serves as a reminder of the serious risks that medical personnel must take when performing standard operations like venipunctures and injections. However, recent studies have also reported that surgical devices are the main cause of NSSI when only physicians are considered (Alfulayw, 2021).

HCWs working 12-hour shifts sustained more injuries compared to 7-hour shift workers, which correlate with the study done by Thomas et al.^[15] Hands were found to be the most affected 125 (94%), which was comparable with the study done by Ziad A. Memish et al.^[16]

Most of the healthcare workers (50%) got injured while wearing single pair of gloves and the findings were found similar with the study done by Anjum Hashmi et al,^[17] which was found to be 59.4%. The commonest place of injury was wards 34 (26.2%) which was in accordance with the study done by Sharma et al were the NSSI happened commonly in wards.^[18]

Nearly 60% of healthcare workers have completed the full course of Hepatitis B vaccination, which was consistent with the findings of Vinodhkumaradithyaet al.^[19]

The majority of the healthcare workers (78.6%) have not reported to the concerned authority, which was comparable with the study conducted by Salelkar et al,^[20] was found to be 91.7%. Only 21.4% of cases were reported to the relevant authority, where subsequent follow-up actions

initiated. However, the majority of incidents were significantly underreported. The reason for underreporting in the present study was concerned with patients not being infectious (table 3), which was in concordance with the study done by Archana et al,^[11] (40%). The results were in favor of the fact that Needle stick injuries go unreported.

Although ICC is obligatory in all healthcare institutions, it is not consistently followed; therefore, preventive initiatives must be developed, and NSI reporting should be made mandatory. Issues requiring attention include the use of safety-engineered devices (SED), recording and reporting of incidents, training of all HCWs in handling and disposal of sharps, establishing a staff-student health service, and inculcating a responsible attitude among HCWs.

CONCLUSION

The study finds that occupational injuries—especially needle-stick and sharps injuries (NSSI) are remarkably common. In order to reduce the incidences and their negative consequences, there is an urgent need for increased collaboration between all stakeholders, given their important and continuous role in exposing healthcare workers to dangerous and potentially fatal infections. Even though total eradication may not be possible, healthcare workers (HCWs) need to be on the lookout for potential occurrences and take extra precautions to reduce the risk of them happening. To guarantee thorough surveillance and response systems, it should also be mandatory to record such instances, even in the absence of urgent infectious concerns.

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