

Frequency of Needle Stick Injury among Dental Students and Dentists of Karachi

¹Kashif Ikram, ²Humayun Kaleem Siddiqui, ³Sana Maqbool, ⁴Maham Altaf, ⁵Sania Khan

ABSTRACT

Objective: To determine the frequency of needle stick injury in dental practice and to evaluate the level of knowledge, attitude and practices of the dental students and dentists regarding needle stick injuries prevention.

Materials and methods: This descriptive cross-sectional study was undertaken at eight different institutes of Karachi from July 2014 to March 2015. Data were collected in 800-sample questionnaire forms that comprised of ten questions in English language. Questionnaire was designed to obtain information regarding frequency, awareness and prevention of needle stick injury. Data were entered and analyzed in Statistical Package for the Social Sciences (SPSS) Version 20.

Result: A total of 800 samples were returned with a 100% response rate. About 73% participants gave a history of needle stick injury during practice. Of these 42% were the house officers. It was reported that knowledge regarding vaccination against hepatitis B was prevalent among participants. Most of the participants agreed that they have received guidelines regarding prevention and protection from needle stick injury.

Conclusion: It was concluded from this study that hepatitis B vaccination is necessary to prevent needle stick injury and proper instruments/guidelines should be given to all health related professionals in order to minimize the risk of blood-borne infections through needle stick injury.

Keywords: Dental professionals, Needle stick injury, Occupational hazards.

How to cite this article: Ikram K, Siddiqui HK, Maqbool S, Altaf M, Khan S. Frequency of Needle Stick Injury among Dental Students and Dentists of Karachi. World J Dent 2015;6(4): 213-216.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Needle stick injuries are wounds caused by needles that accidentally puncture the skin. Accidents with needles are one of the most common types of injury in the healthcare setting.¹ Dentists, as well as other dental personnel are constantly exposed to a number of specific occupational hazards. They cause the appearance of various ailments, specific to the profession, which develop and intensify with years.² Needle stick injury is the foremost cause for the spread of cross-infections. Exposure to bloodborne pathogens due to needle stick injuries in particular is a potential risk for healthcare workers, including dentist, dental students and dental staff.³

Needle stick injuries are a hazard for people who work with hypodermic syringes and other needle equipment. These injuries can occur at any time when people use, disassemble or dispose of needles.

Dentists and dental students are exposed to blood and other body fluids in the course of their work. Consequently, they are risk of infection with bloodborne viruses including human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV).⁴ The risk of infection for dentists depends on the prevalence of disease in the patient population, nature and frequency of exposures.⁵

While using needles and sharp instruments, injuries can happen at any time of procedure due to various reasons.⁶ An injury can occur when performing a procedure on a patient with a sharp instrument, when there is an unexpected movement by the patient or work colleague, or a momentary lack of concentration.⁷ Re-sheathing a used needle is a common cause of needle stick injuries. Even though a healthcare worker may have repeated the procedure many times, one slip can cause injury with potentially serious consequences.⁸

Inadequate staff, lack of experience, insufficient training, duty overload and fatigue may lead to occupational sharp injuries.⁹

It is estimated that approximately 600,000 to 800,000 needle stick injuries occur each year among healthcare workers in the United States. More than half of these injuries are not reported. In Pakistan, the incidence of needle stick injury is approximately 2.9% in general dental practitioners, 2.4% in undergraduates' students,

¹Principal, ²Head, ³Research Analyst and Coordinator

^{4,5}House Officer

^{1,2}Department of Oral and Maxillofacial Surgery, Baqai Dental College, Baqai Medical University, Karachi, Sindh, Pakistan

³Department of Dental Education, Baqai Dental College
Department of Public Health, Baqai Institute of Health Sciences
Baqai Medical University, Karachi, Sindh, Pakistan

^{4,5}Department of Oral and Maxillofacial Surgery, Baqai Dental College, Karachi, Pakistan

Corresponding Author: Sana Maqbool, Research Analyst and Coordinator, Department of Dental Education, Baqai Dental College
Department of Public Health, Baqai Institute of Health Sciences
Baqai Medical University, Karachi, Sindh, Pakistan, Phone: 0092-331-0374307, e-mail: drsana.maqbool@gmail.com

16.3% in faculty and 44.7% in house officers.¹⁰ The average percutaneous transmission rates for hepatitis B and C are 33.3% and 3.3% respectively. Administration of pre-exposure vaccination or postexposure prophylaxis is effective in preventing HCV infection.¹¹ According to World Health Organization (WHO) study, the annual estimated proportions of healthcare workers (HCW) exposed to bloodborne pathogens globally were 2.6% for HCV, 5.9% for HBV and 0.5% for HIV corresponding to about 16,000 HCV infections and 66,000 HBV infections in healthcare workers worldwide.¹²

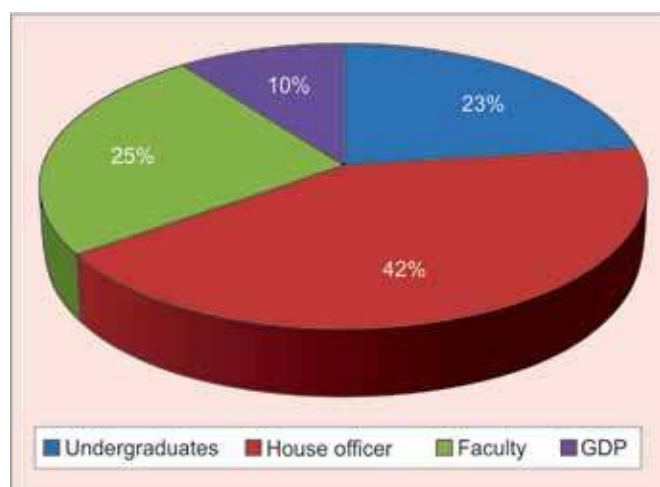
So, the aim of this study was to determine the frequency of needle stick injury in dental practice and to evaluate the level of knowledge, attitude and practices of the dental students and dentists regarding needle stick injuries prevention.

METHODOLOGY

This descriptive cross-sectional study was carried out at eight different institutes of Karachi, Pakistan from July 2014 till March 2015. Undergraduates, house officers, faculty and general dental practitioners (GDPs) of various colleges were approached and after taking their consent, they were provided questionnaire forms which comprised of ten questions regarding knowledge, attitude and practices related to needle stick injury. Statistical Package for the Social Sciences (SPSS) Version 20 was used to analyze the data.

RESULT

A total of 800 questionnaires were returned from eight different institutes of Karachi, with a response rate of 100%, in which 184 (23%) were undergraduates, 337 (42.1%) were house officers, 197 (24.6%) were faculty and 82 (10.3%) were general dental practitioners (Graph 1). Out of these, 585 (73.1%) gave a history of needle stick injury during practice. Around 742 (92.8%) participants were vaccinated



Graph 1: Frequency of number of participants in the study

Table 1: Frequency, knowledge and practice regarding needle stick injury

Items	Yes	No	Do not know
Have you ever been inoculated by needle during practice?	73.1%	24.5%	2.4%
Are you vaccinated against hepatitis B?	92.8%	3.5%	3.8%
Have you ever been provided with any instructions associated with the risk of bloodborne infections within the framework of your clinical training?	82.3%	7.6%	10.1%
Do you think that the vaccination you have received will protect you from viral hepatitis?	Yes 73.0%	No 3.0%	May be 24.0%
Do surgical gloves reduce the probability of NSI by the wearer?	38.5%	18.0%	43.5%
Should needle be recapped after use?	51.0%	4.8%	44.3%
You know PEP after NSI	70.1%	12.3%	17.3%

for hepatitis B, among them 584 (73%) participants were sure that vaccination will protect them from viral hepatitis, while 192 (24%) were not sure. A total of 82% of the participants agreed that they have been provided with the instructions associated with the risk of bloodborne infections in clinical training. Of these, 38.5% participants agreed that a surgical glove reduces the probability of needle stick injury where as 43.5% did not agree with this.

The practice of recapping needle after use was still prevalent among the participant, i.e. 51%. Some participants also revealed that they are not sure about recapping needle after use, i.e. 44% (Table 1).

When the participants asked about prevention of needle stick injury, 38% suggested that re-sheathing should be avoided, 34% suggested that needle approximation should be done carefully and 27% suggested that needle should be placed in sharp container after being used. They also suggested that training and education (54%) should be provided to the workers and protocols should be laid down in outpatient departments (OPDs) (40.5%).

The action taken after needle stick injury included washing the site under tap water (46%), history taking to the patient (20%), no action (24%), medical advice (5%) and blood test (4%) (Table 2).

It was good to note that about 70% of the participants that included undergraduates, house officers, faculty and general dental practitioners knew about the availability of post exposure prophylaxis (PEP) services after needle stick injury.

DISCUSSION

Needle stick injury is a matter of concern as it has been shown that needle stick injury is being a route of

Table 2: Prevention of needle stick injury

	<i>None water</i>	<i>Medical advice</i>	<i>Blood test</i>	<i>History</i>	<i>Wash under tap</i>
What safety protocols did you use after NSI?	24.3%	5.4%	4.1%	20.0%	46.3%
	<i>No re-sheathing</i>	<i>Place the needle in sharp containers</i>	<i>Approximate needle carefully</i>		
How can you prevent NSI?	38.3%	27.4%	34.4%		
	<i>Training and education</i>	<i>Protocols should be laid in OPDs</i>	<i>Do not know</i>		
What suggestions do you have for preventing NSI?	54.4%	40.5%	5.1%		

transmission of certain potential detrimental diseases. Our findings indicate that house officers from different institutes of Karachi are at high risk of needle stick injury i.e. 42% followed by faculty and general dental practitioners that is 25 and 23% respectively. One study indicates that in private hospitals needle stick injuries are more common in doctors as paramedical staff strictly follow the protection protocols. Other studies have also shown higher prevalence of needle stick injuries in residents and junior dentists.³

Aeeza Malik et al study from Nepal reported 74% needle stick injury among dental practitioners and staff, while in a research conducted in Iran it was 39.4%.¹³ Many researchers have analyzed needle stick injuries among healthcare professionals and not only on general dental practitioners. Their results illustrated that 74% of participants know about precautions concerning needle stick injuries.¹³

Aslam M et al showed that 34% of participants with needle stick injury were exposed to needles that were contaminated with fluid of hepatitis B or C patients, which is alarming because it has been observed that large number of hepatitis infection occur as a result of needle stick injury.³

In our study, it has been observed that 82% participants were provided with instructions associated with the risk of bloodborne infections in their clinical training. However, 93% of participants have the knowledge about vaccination and 73% were confident that vaccination would protect them from viral hepatitis.

In a study of Sumathi Muralidhar et al revealed that 74% of healthcare workers were using gloves at a time of needle stick injury, a figure which fell short of the figures shown by Askarian et al (96.2%) in Iran.⁸ However, in our study 38.5% of the participants agreed that gloves reduces the probability of needle stick injury where as 43.5% of the participants were not sure about it.

CONCLUSION

It was concluded from this study that hepatitis B vaccination is necessary to prevent needle stick injury and proper instruments/guidelines should be given to all health related professionals in order to minimize the risk of bloodborne infections through needle stick injury.

REFERENCES

1. Martins AM, Santos NC, Lima MD, Pereira RD, Ferreira R. Needle stick and sharp instrument injuries among dentists in Montes Claros, Brazil. *Arquivos Odontol* 2010;46(3):127-135.
2. Gupta N, Tak J. Needles stick injuries in dentistry. *Kathmandu University Med J* 2011;35(3):208-212.
3. Aslam M, Taj T, Ali A, Mirza W, Ali H, Dar M, Badar N. Needle stick injuries among health care workers of public sector tertiary care hospitals of Karachi. *J College Physic Surg, Pakistan* 2010;20(3):150-153.
4. Ahmad A, Ali T, Ghazi A, Younus Khan M, Ali Z. Needle sticks injury and associated factors among medical students. *Pakistan J Surg* 2008;24(3):145-149.
5. Trim JC, Elliott, et al. A review of sharp injuries and preventive strategies. *J Hosp Inf* 2003;53(4):237-242.
6. Kapoor K, Gambhir RS, Singh S, Gill S, Singh A. Knowledge, awareness and practice regarding needle stick injuries in dental profession in India: a systematic review. *Niger Med J* 2013 Nov-Dec;54(6):365-370.
7. Moazzam A, Salem ZA, Griffith BR. Needle stick injuries: an overview of the size of the problem, prevention and management, occupational and environmental health and safety, Sheikh Khalifa Medical City, Abu Dhabi, United Arab Emirates. *J Med Biomed Sci* 2010;2(2):53-61.
8. Muralidhar S, Singh RK, Malhotra J, Bala MM. Needle stick injuries among health care workers in a tertiary care hospital of India. *Ind J Med Res* 2010 Mar;131:405-410.
9. Askarian M, Malekmakan L, Memish ZA. Prevalence of needle stick injuries among dental, nursing and midwifery students in Shiraz, Iran GMS. *Krankenhhyg-Interdiszip* 2012;7(1).
10. Zuberi BF, Zuberi FF, Hasan SR, Kumar R, Memon SA, Afsar S. Frequency of acute hepatitis C after needle stick

- injury and its treatment outcome. *Pak J Med Sci* 2009;25(5): 766-769.
11. Sjöström TH, Skyman E, Hellström L, Kula M, Grinevika V. Cross-infection prevention, basic hygiene practices and education within nursing and health care in Latvia: a Swedish-Latvian practice development project. *Nurse Educ Today* 2003;23(6):404-411.
 12. Sharma R, Rasania SK, Singh S. Study of prevalence and response to needle stick injuries among healthcare workers in a Tertiary Care Hospital in Delhi, India. *Ind J Community Med* 2010 Jan;35(1):74-77.
 13. Malik A, Shaukat MS, Qureshi A. Needle stick injury: a rising bio-hazard. *J Ayub Medical College, Abbottabad* 2012; 24(3-4):144-146.