

Knowledge and Attitude of Dental Professionals, Students and Dental Auxiliary Staff Towards Needle Stick Injury and Sharp Injuries



Fizza Jawaaid Baig¹

BDS, RDS

Hiba Qazi²

BDS

Maham Nadeem³

BDS

Shahid Islam⁴

BDS, FCPS

Elham Habib⁵

BDS

Azam Aliuddin⁶

BDS, FCPS

OBJECTIVE: The present study aims to evaluate the knowledge and attitude of dental professionals, students and auxiliary towards needle stick and sharp injury.

METHODOLOGY: A cross-sectional questionnaire-based survey was carried out among 200 dental practitioners, students, and auxiliary staff using OpenEpi calculator. Final data were analyzed using SPSS version 23.0.

RESULT: The result revealed that 97% of the participants had an understanding of NSI and the risks associated with it and about 87.5% participants were found to be vaccinated against Hepatitis B.

In addition to that, 72% of dental healthcare workers especially the auxiliary staff (96.3%) had experienced needle stick injury and 97% of the subjects were found to have a habit of recapping the needle after use.

CONCLUSION: The knowledge of dental practitioners especially the auxiliary staff concerning needle stick injury was found to be inadequate. More awareness should be raised regarding NSIs for the dental healthcare workers and practicing of universal guidelines must be emphasized greatly.

KEYWORDS: Needle stick injury and sharp injuries

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INTRODUCTION

A puncture or tear from a needle or any razor-sharp object that is contaminated with blood or bodily fluid of an individual carrying an infectious disease. Healthcare workers in hospitals and clinics, including doctors, paramedical staff, assistants, and technicians, all are liable to such injuries caused by soiled needles or sharp objects, therefore they are at a greater risk of acquiring hematogenic infectious diseases due to increased exposure

to viruses and microorganisms. Needle stick injury (NSI) is the most common cause for the spread of blood borne communicable diseases such as Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human Immunodeficiency Virus (HIV). Dental practitioners and students are exposed to blood and body fluids during work on a daily basis and dental auxiliary are exposed while handling of used instruments; hence, they are all at a risk of acquiring blood borne diseases as a result of needle stick and sharp injuries (NSIs).

As per WHO, the annual approximate proportion of healthcare workers (HCWs) exposed to blood borne pathogens globally were 2.6% for HCV, 5.9% for HBV and 0.5% for HIV.^{1,2} More than 90% of these transmissible infections occur in developing countries but most of these needle stick injuries remain unreported.³ Occupational sharp injuries can be a consequence of insufficient experience, inadequate training and exhaustion.⁴ The existence of blood

1. Dental practitioner, Kashif Dental Clinic, Fatima Jinnah Dental College, Karachi.
2. FCPS-I, Orthodontic Resident at Alvi dental hospital Fatima Jinnah Dental College, Karachi.
3. House Officer, Fatima Jinnah Dental College, Karachi.
4. Assistant Professor, Fatima Jinnah Dental College, Karachi.
5. Lecturer, Sindh Institute Oral Health Sciences, Jinnah Sindh Medical University, Karachi.
6. Assistant Professor, Baqai Medical University, Karachi.

Corresponding author: "Dr. Fizza Jawaaid Baig" <fizza.baig95@gmail.com>

and mucus, and the vast variety of microbial flora in the oral cavity along with the regular usage of sharp instruments in dental treatment, contributes to elevated risk of blood borne infections in the dental office.⁵ The load of SIs and NSIs can be diminished in the dental work environment, when dental professionals act in accordance with the contemporary and universally approved quality precautionary measures against needle stick injuries.⁶ Possible exposures are unregulated to needle sticks alone as manipulation of other sharp instruments or mucous membrane disclosure to infected bodily fluids also can result in the conveyance of infectious diseases.⁷

So, the aim of this study is to evaluate knowledge and attitude towards preventing needle stick and sharp injury, its complications and awareness regarding post exposure prophylactic measures amongst dental healthcare workers. Previously, limited and brief studies have been conducted on this subject. Hence, the rationale for our study is to deeply assess the understanding of NSI and sharp injuries in dental professionals, students and auxiliary staff members of different tertiary care dental hospitals in our country. This will help us determine the severity of this issue and allow us to take steps to alleviate the frequency of NSI injuries within our dental community.

METHODOLOGY

This cross-sectional study was held in Karachi, Pakistan during 2019 and 2020 and the study population comprised of final year dental students, dental house- officers, dental practitioners and dental auxiliary staff from four prestigious dental institutions in Karachi. The dental institutes involved were Fatima Jinnah Dental College and Hospital (FJDC), Karachi Medical and Dental College (KMDC), Baharia University (BU) and Dow University of Health Sciences (DUHS).

The sample size for this study was calculated by using OpenEpi calculator and was estimated to be 200. It was randomly collected from dental students, practitioners and auxiliary staff from the above mentioned four colleges. Written consent was also taken from the participants before taking samples.

A valid questionnaire that comprised of 14-close ended questions was designed specially to test the knowledge and attitude of participants regarding NSI and its risks and the cross infections associated with use of needle and sharp instruments, the preventive measures and techniques and immediate management after experiencing NSI. The status of vaccination of the participants against Hepatitis B and their techniques for prevention against NSI were also evaluated in the present study.

The information collected in this study was then carefully tabulated and the statistical analysis was performed to get the percentages which were then further calculated and the final result was obtained by using SPSS version 23.0.

RESULT

In total 200 subjects were included in the study and the participants comprised of 64.5% female and 35.5% male. Among them were undergraduate students (20.5%), house officers (50.5%), dental postgraduates (11.5%), dental consultants (4%) and dental auxiliary staff (13.5%). According to the study majority (97%) of participants were aware of needle stick/sharp injury and the communicable

Fig 1: Most Common Cause of Needle Stick/Sharp Injury

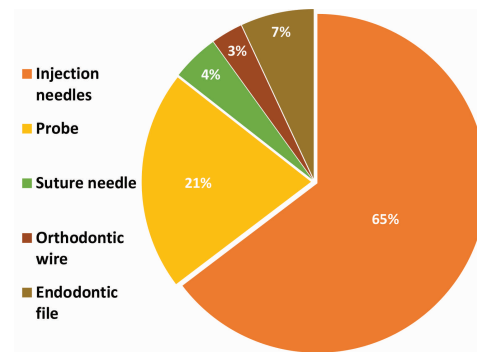


Table 1: Knowledge and Attitude on Needle Stick Injury

Questions	UG	HO	PG	Consultant	AS	Total
Habit of recapping						
Yes	38 (93)	99 (98)	22 (96)	8 (100)	27 (100)	194 (97)
No	3 (7)	2 (2)	1 (4)	0 (0)	0 (0)	6 (3)
Technique of recapping preferred						
• Scoop method	29 (71)	93 (92)	21 (91)	8 (100)	15 (56)	166 (83)
• Two handed technique	9 (22)	6 (6)	1 (4)	0 (0)	12 (44)	28 (14)
Method of disposing needles:						
• Needle cutter	30 (73)	54 (53)	21 (91)	8 (100)	18 (66)	131 (65.5)
• Needle burner and syringe destroyer	4 (10)	12 (12)	0 (0)	0 (0)	1 (4)	17 (8.5)
• Puncture resistant sealed containers	5 (12)	21 (21)	1 (4)	0 (0)	7 (26)	34 (17)
• Needle incinerator	2 (5)	14 (14)	1 (4)	0 (0)	1 (4)	18 (9)

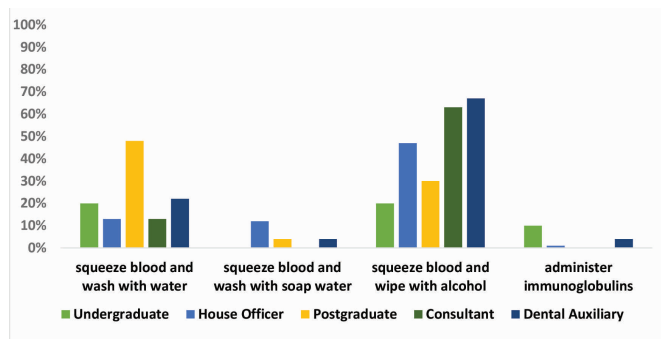
UG= Undergraduate, HO= Dental House Office, PG= Dental Postgraduate, As= Dental Auxiliary Staff

Table 2: Measures to Prevent Needle Stick/Sharp Injury (%)

	Careful Handling of Instruments	Using Scoop Method for Recapping	Proper Disposal of Needles	Other	All Measures
UG	6 (15)	3 (7)	1 (2)	1 (2)	30 (74)
HO	12 (12)	13 (13)	2 (2)	0 (0)	74 (73)
PG	2 (9)	6 (26)	0 (0)	0 (0)	15 (65)
Consultant	0 (0)	3 (37.5)	0 (0)	0 (0)	5 (62.5)
AS	17 (63)	0 (0)	3 (11)	1 (4)	6 (22)
Total	37 (18.5)	25 (12.5)	6 (3)	2 (1)	130 (65)
P	0.000				

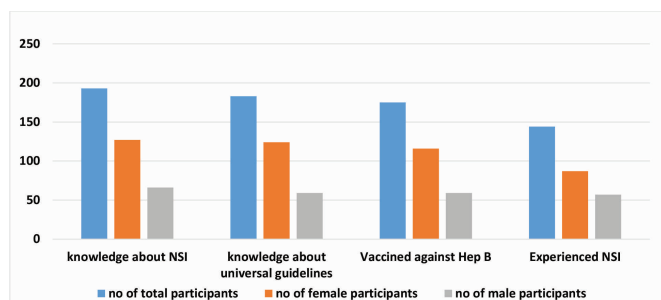
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Fig 2: Measures Taken After Experiencing
Needle Stick/ Sharp Injury



UG= Undergraduate, HO= Dental House Office, PG= Dental Postgraduate, As= Dental Auxiliary Staff

Fig 3: Difference in result of male and female participants



conditions caused by it. About 91.5% participants practiced universal precautions and 89.5% of them took detail medical history of patients. Nearly 87.5% participants were vaccinated against Hepatitis B. Further-more 65% of the participants also stated injection needle to be the most common cause of contracting NSI.

DISCUSSION

Even though universal precautionary guidelines and general awareness among healthcare providers have lowered the risk of needle stick injuries (NSIs) all around the world over the past 30 years, these injuries continue to occur till this day, albeit at a much lower rate. Mostly surgeons, dental practitioners and nurses are found to be most susceptible to NSI.

Dental health care providers and the auxiliary staff have higher chances of exposure to blood and oral fluids and therefore they are at a greater risk of acquiring communicable blood-borne illnesses. The degree of risk depends upon the amount of patients that are infected and the level of precautionary measures taken by the dental healthcare workers while dealing with these patients.

The current study shows that 96.5% of the Dental healthcare workers were aware about needle stick injury

(NSI) and its association with communicable infections such as Hepatitis B, C and HIV. Only 4% of them which majorly involved the auxiliary staff were quite oblivious about it. Similar results were found in the study done by Pavithran VK⁹ in which, 88% of the dental practitioners count NSIs as a leading cause of Hep B, C and HIV communication. We also found that 91.5% of the dental HCW practiced general precautionary guidelines while treating patients and only 8.5% which mostly comprised of auxiliary staff (37%). Whereas in a study by Santhosh Kumar⁷ only 37% of dental students and in a study by Pavithran VK⁹ 58% dental professionals practiced universal precautions.

We also discovered that 89.5% of the Dental HCW majority being dental practitioners and dental students took detailed medical history of their patients before starting any dental procedures. When asked about the vaccination status of the dental health workers we found out that about 87.5% participants acquired vaccination against hepatitis B while the remaining 12.5% of DHW especially the auxiliary staff (48%) were unfortunately not vaccinated against hepatitis B. Similar results were seen in the studies done by Muhammad Shahzad¹³ (68%), Rana Pratap Maurya¹¹ (94-100%), Santhosh Kumar⁷ (87%) in which it was noted that majority of the participants had been vaccinated against Hepatitis B.

In the current study 72% of dental HCW especially the auxiliary staff (96.3%) experienced NSI. 50% have had NSI once a year followed by 31% participants who had NSI once a month. In a study by T. Akhund¹² 54.2% qualified dentists and 51.1% of dental technicians had experienced NSI at least once in 12 months. Also 58% dental practitioners experienced NSI during the treatment and the remaining 42% that majorly include the auxiliary staff experienced NSI at the end of dental treatment while disposing off the used instruments.

It was noted in this study that 65% of the participants reported injection needle as the commonest cause of sharp injury. While 21% reported dental probe and 7% reported endodontic files as the common cause of sharp injury. Another study done by Maurya RP¹¹ reported orthodontic wires as the most frequent cause of NSI (18.75%) followed by explorer (15.63%). In the study by Pavithran VK⁹ about 21% of the participants considered surgical instruments as the most common cause for NSI.

Upon further questioning about measures taken immediately after NSI, among those who had experienced NSI about 42.5% of them assert that they squeeze their blood and wash the injured site with alcohol swab, followed by 19.5% who squeeze their blood and washed with water alone. Only 7% participants washed the site first with soap then with water. The results were found to be drastically

different to the findings by Maurya RP¹¹, who stated in his study that 93.33% participants washed the affected site with soap and water and knew about post exposure prophylaxis. In current study maximum number of participants had knowledge about post exposure prophylaxis and also knew that thorough cleaning of the affected side with either soap water or alcohol swab should be done right after contracting a sharp injury. In contrast to our findings, in the study by Alam M¹⁴ not many participants were aware about proper post exposure prophylaxis.

In this present investigation 63% of the dental HCW asserted that they would inform the health care department after experiencing NSI, whereas in a study conducted by Pavithran VK⁹ 81% dentists stated that they would first report to the medical emergency department. In addition to this we also believe that it is most significant to educate our colleagues and staff about hazards of NSI and its prevention. In our study we determine that 85% of the participants guided their staff/colleague regarding NSI and its prevention.

Far too many studies consider recapping of needles as a major source of contracting NSI and therefore condemn recapping of needle after use and state that it greatly helps in preventing NSI. According to the Occupation Safety and Health Administration guidelines, recapping of the needles has been interdicted.¹⁰ In our current study, 97% of the subjects had a habit of recapping the needle after use. In a study by Rana Pratap¹¹ (80%), Santhosh Kumar⁷ (76%) and A. Malik⁶ (88%) dental personnel believed that all needles should indeed be recapped after use. In this study 83% participants practiced the single-handed scoop technique while the remaining (14%) practiced two-handed technique, 44% of them were auxiliary staff. Pavithran VK⁹ and Santhosh Kumar⁴ stated that majority practiced single-handed technique for needle recapping (69% and 82%, respectively).

One of the most notable issue is disposal of used needles. According to our study 65% subjects used needle cutter for needle disposal, 17% used puncture resistant sealed containers and 9% used needle burner or syringe destroying device, similarly 9% used needle incinerator. In contrast Pavithran VK⁹ found that 54.5% dental professionals used needle heater and syringe destroyer, 21% used needle cutting appliance, 14% used impenetrable secured containers and 10.5% used needle incinerator machine. Rana Pratap¹¹ reported that only 43% participants had knowledge regarding the safe disposal of sharps in puncture proof containers.

In the present study 65% of the dental HCWs were aware and practice all measures to prevent NSI out of which only 22% were auxiliary staff. 63% auxiliary staff believed that only careful handling of instruments can prevent NSI. Education concerning prevention of NSIs and its PEP

measures should not only be provided to dental students but also to the auxiliary staff.

CONCLUSION

It was concluded that the awareness of dental professionals, students and especially dental auxiliary regarding NSIs and their prevention were quite inadequate. NSI can be prevented further by thoroughly instructing and training dental staff and healthcare workers. Moreover, importance of universal precautions should also be made clear to the dental HCWs, students and paradental staff. In addition to that, vaccination against Hepatitis B should be made compulsory for all dental HCWs. The status of their vaccination should also be reviewed yearly. Post exposure prophylaxis should be taught thoroughly so that all dental HCWs know what measures should be taken after contracting NSI/SI and how to report it to the healthcare department.

CONFLICT OF INTEREST

None declared

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