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Original Article

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Prevalence of Needlestick Injuries and the preventive response of affected Dental healthcare persons working in Islamabad, Rawalpindi, and Abbottabad Pakistan.

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ABSTRACT

BACKGROUND & OBJECTIVE: Needle sticks and other sharps injuries are common and serious hazards in healthcare facilities, exposing healthcare workers to blood-borne pathogens like HIV, hepatitis B, and C and affecting the physical and psychological health of dental staff. Our study aims to find the prevalence of needle injuries and preventive responses by affected ones.

METHODOLOGY: A cross-sectional study was conducted at various Dental hospitals and clinics in Islamabad, Rawalpindi, and Abbottabad Pakistan, from December 2023 to May 2024. A close-ended questionnaire was distributed among 400 dentists and other healthcare workers at participating dental hospitals and clinics to collect the data. A total of 345 completely filled forms were collected and assessed by using SPSS 22.

RESULTS: Out of 345, 241 healthcare persons reported needle injury at least once. The majority of injuries (78%) occurred at the chairside, 14% in the operation theatre and 8% at other locations. 197(81.7%) were self-inflicted during needle uncapping/recapping, and 44 (18.3%) were by the assisting staff. About 82% of injuries were with syringes while 18% were by sutures or other sharps. To manage the Needlestick injury (NSI), 159(66%) immediately washed the injury site with water and soap, 27(11%) pressed to bleed, 19(8%) applied antiseptic, 17(7%) took post-exposure prophylaxis against Hepatitis B, C and HIV/AIDS and 8 % did nothing.

CONCLUSION: This study showed that Needlestick injury (NSI) was a common finding at dental workplaces, leaving a physical and psychological fear impact on healthcare persons.

KEYWORDS: Prevalence, Prevention, Needlestick Injury, Health Care Professional.

INTRODUCTION

Dental surgeons and health care workers are always at an increased risk of unintended incidence of needle sticks [1-3]. Body fluids especially blood, one of the major sources of contamination transmission, can put healthcare employees at raised chances of acquiring hepatitis B, C, HIV, and several other infections during various medical and dental procedures [4-7]. A WHO study regarding an annual exposure of healthcare workers (HCW) to blood-borne infections, has reported to be estimated about 2.6% for HCV, 5.9% for HBV, and 0.5% for HIV globally [8].

Dental surgeons and other staff in the Dental hospitals and clinics generally don't report the prevalence resulting in less interpretation of quantity of cases of needle injuries. According to a study, the estimation of prevalence maybe 10 times less pronounced than recorded by Standard occupational reporting systems [9,10]. Needlestick injuries resulting from minor ignorance or lack of training not only potentiate health consequences but also lead to emotional misery among dentists and other healthcare workers [11, 12]. It may affect the health care services and resources by affecting dental surgeons and their staff and increasing disease burden in the population especially in developing countries like Pakistan.

Beneficial Guidelines for safe practice introduced by the Viral Hepatitis Prevention Board (VHPB) are observed very effective in reducing the prevalence of needle-stick incidences in many countries [13,14].

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However effective and strict implementation of these guidelines among healthcare people along with dentists in Pakistan, is now not reported ensuring the prevalence of such incidences. Additionally, the actions and responses of dental care providers after needle accidents are not always properly prepared and up to the guidelines to prevent infections from spreading [13,14].

The present study aimed to spotlight the prevalence of needlestick incidences under the instances they occur and to see the protective response of the affected care providers against such incidences at Dental setups of Rawalpindi, Islamabad, and Abbottabad, Pakistan.

METHODOLOGY

This cross-sectional study was conducted at teaching dental hospitals and dental clinics in Rawalpindi, Islamabad, and Abbottabad Pakistan, from December 2023 to May 2024. The dental college's ethical review board granted permission (Ethical Approval No. EC-27/15/12/2023) to research the topic. The sampling procedure was convenient sampling and close-ended questionnaire-based. A total of 400 Questionnaires were printed. In Inclusion criteria, all dentists and related Staff who experienced NSIs with complete data forms between Dec 2023 to May 2024 were included in the final sample size.

Exclusion criteria: The healthcare persons who refused to fill forms and those incompletely filled forms were excluded The authors and nominated dental surgeons distributed the questionnaires /data forms at their dental hospitals and various Dental clinics. Dental faculty members, dental surgeons, house officers, dental students, and paramedical staff all were included in the study. The responders gave their informed consent. Filled data forms about needle injury and their response were collected after a given time.

Statistical analysis: Included the incidence/prevalence of NSIs among the affected male and female participants. The data of 345 participants including 241 NSI incidents recorded was entered into SPSS Software and Pearson Chi-test was applied to find the significance of results.

RESULTS

There were 345 healthcare persons (157 males and 188 females) who participated in the study. Participants and affected persons are shown in Fig 1 and Table 1. The p-value is 0.69 showing that the results found are not significant at $p < 0.05$ and suggests that both male and female participants are similarly affected by NSI.

Figure I: Showing the Number of Dental Professionals and healthcare staff affected by needle stick injury (N=241)

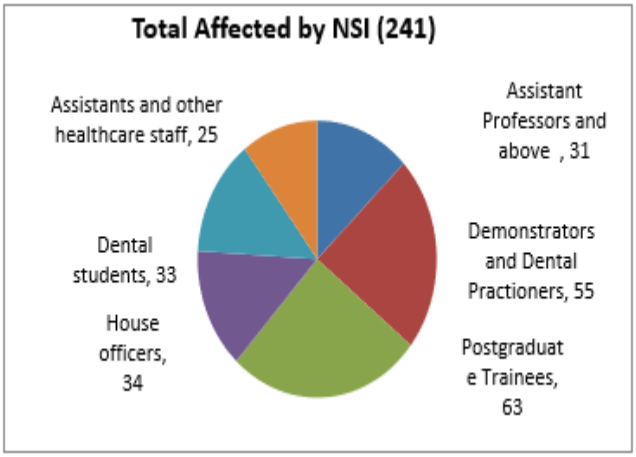

Table-II: shows the type of needles involved and the timings of Needlestick injury.

Variables	Categories	n(%)
Type of needle	Hollow bore needle	181(75)
	Solid needle	41(17)
	Other sharps	19(8)
Injury timings	Chairside	173(71.8)
	Operating theatre	42(17.4)
	Others	26 (10.8)

The p-value is 0.7. The result found is not significant at $p < 0.05$. It suggests that the causes of injury among the participants are almost similar.

Table- IV: shows the response of HCWs to manage NSI. The p-value of 0.2 shows that the results found are not significant at $p < 0.05$ and suggests that the protective response of affected male and female healthcare persons is almost the same.

Table -I: Distribution of gender and affected by NPI.

	Categories	Affected or Not Affected		Total n(%)	P-Value
		Not Affected n(%)	Affected n(%)		
GENDER	Male	49(14.2)	108(31.3)	157 (45.5)	0.69
	Female	55(15.9)	133(38.6)	188 (54.5)	
	Total	104(30.1)	241(69.9)	345(100.0)	

Table-III: shows various causes of NSI during dental procedures.

Gender	Cause of Injury						Total n(%)	P-Value
	Uncapping and recapping	Cleaning of needle	Passing of needle	Loading of needle	Suturing	Other reasons are rush, lack of assistance, skills, and fatigue		
Male	65(27.0)	6(2.5)	11(4.6)	7(2.9)	5(2.1)	14(5.8)	108(44.8)	0.70
Female	70(29.0)	9(3.7)	10(4.1)	11(4.6)	8(3.3)	25(10.4)	133(55.2)	
Total	135(56.0)	15(6.2)	21(8.7)	18(7.5)	13(5.4)	39(16.2)	241(100)	

Table-IV: Response of the health care workers after the most recent needle stick injury.

Gender	Response After Injury					Total n(%)	P-Value
	Did nothing n(%)	Simply wash with water and soap n(%)	Pressed to bleed n(%)	Applied antiseptic/ Alcohol swab n(%)	Reported to hospital and took post-exposure prophylaxis n(%)		
Male	11 (4.6)	67(27.8)	14(5.8)	11(4.6)	5(2.1)	108(44.8)	0.261
Female	8(3.3)	92(38.2)	13(5.4)	8(3.3)	12(5.0)	133(55.2)	
Total	19(7.9)	159(66.0)	27(11.2)	19(7.9)	17(7.1)	241(100)	

DISCUSSION

Local anesthesia is frequently used in dental treatments. The use of needles in the form of syringes and stitches is very common in dentistry. These needles sometimes do cause injury to the dentist and other staff while dealing with patients. Several studies have shown that many healthcare personnel including dental surgeons, experience such injury during their practices [15-20]. A study in Saudi Arabia in 2021 found the incidence of NSI was about 22.2%, whereas a WHO study on sharps injuries has also estimated such injury incidences averaged between 0.2 to 4.7 per healthcare worker in a year [15, 21].

The present study was conducted to find out the incidence of such needle injuries and the protective response of affected persons in dental settings. The 241(70%) NSI incidences recorded in the current study show huge numbers where the dental professionals, professors demonstrators, dental surgeons, students, and assisting staff were all among the affected individuals similar to the results seen in a past study. [15].Also, the Results regarding needle type and injury timings, obtained in our study (mentioned in Table-II) are very much consistent with the previous study [22].

Un-capping and Recapping, cleaning, rushing, fatigue, loading, and passing needles are significant contributing factors to Needle Injury in healthcare workers. The careful uncapping and prohibition of recapping of used needles is strictly emphasized in every training session but the data gathered in our study still found a lot of incidences resembling to the findings in earlier studies [23,24]. Dentists must try to avoid hurrying and long working hours to minimize the risk of injury to themselves as well as to patients. The results of the present study indicating about 16.2% of incidences reported, were due to hurry, fatigue, lack of assistance, and skills while needle handling, similar to seen in other studies [9,23,24].

The protective response of most of the affected persons recorded in the results of this study, Table-IV, was very similar to other studies [9]. As seen from the results, only a small percentage (7%) of NSIs are reported to the healthcare system or to a senior or supervisor in the hospital. Reporting such incidences should be a crucial component of prevention programs. All teaching hospitals should have a strategy to deal with NSIs and appropriate facilities for quick treatment reaction to them as mentioned in studies [25].

Injuries usually happen while ignoring safety measures. Personal protective equipment (PPE) like Gloves and needle safety rings are to be the first line of defense against such injuries. However, many dental surgeons and the majority of dental assistants and technicians don't wear them during routine procedures and get injured [26]. It should be highlighted in safety training sessions and courses that

special safety measures should be taken while handling needles and sharp objects from usage to disposal [3,9].

Needlestick injuries resulting from minor ignorance or lack of training not only potentiate health consequences but also lead to emotional misery among dentists and other healthcare workers [11,12]. It may affect the health care services and resources by affecting dental surgeons and staff thus increasing the disease burden in the population especially in developing countries like Pakistan. Safety training must be a routine practice and educational materials highlighting the safety measures during the use of needles and cutting the used needles rather than recapping them, should be displayed in the clinics.

RECOMMENDATIONS

Needlestick injuries may be reduced significantly by adopting preventive measures. The Dental surgeons and helping staff should use protective gear and safety devices to avoid injuries. They should not hurry or panic while dealing with needles. Trained staff should be encouraged and at busy practices, and departments, more staff should be allocated. Implementation of routine training in teaching hospitals can be helpful in decreasing the incidences.

CONCLUSION

Needlestick injuries are a common occupational risk that dental surgeons and other hospital workers deal with on a regular basis and realistically, it might be impossible to avoid it at all. High prevalence may be due to ignoring safety measures and lack of training. Moreover, preventive response after such injuries lacks guidance and information resulting in compromising the health and safety of dentists and patients as well. It highlighted various causes and risk factors of needle injury, the protective response of affected dental staff, and necessary training at teaching institutes and hospitals for prevention or to minimize such common but serious injuries.

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Authors' Contribution:

Muhammad Umair: Substantial contributions to the conception.
Abdul Manan: Design of the work.
Sadia Rashid: The acquisition and analysis of data for the work.
Abdul Qadir: Interpretation of data for the work.
Nusrat Tariq: Drafting the work.
Akif Mahmud: Reviewing it critically for important intellectual content.

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