

# Needle Stick Injury: A Survey of Five Dental Colleges of Karachi

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## ABSTRACT

**Objective:** The goal of this research is to find out the rate of needle stick injury in dental practitioners and to check the awareness level among dental health care workers of Karachi.

**Study Design:** Description / Cross-Sectional Study.

**Place and Duration of Study:** The study was conducted at the Jinnah Medical and Dental College. The data was collected from five different dental colleges of Karachi (JMDC, FJDC, DIDC, LCMD and Hamdard) from 15 November 2016 to February 2017.

**Materials and Methods:** A 15-item questionnaire was used to collect the data. To examine the research questions, data was collected from 180 respondents comprising of faculty and graduates of the respective dental colleges (JMDC=50, FJDC=58, DIDC=53, LCMD=8 and Hamdard=11).

The respondents filled the questionnaires in the presence of the researcher to expedite the process and to answer any potential inquiries. This study used simple random sampling procedure to gather an unbiased data from a large population. The data was stored in excel worksheet and analyzed using SPSS.

**Results:** Out of the 180 dental practitioners evaluated for this research, 58.88% reported with a positive history of needle stick injury. Among these 27.77% have had the injuries multiple times. At the time of injury, 54.4% of dental practitioners were wearing gloves. 81.11% of practitioners took immunization history, 30% practitioners got their blood screening done after the injury. 86.66% dental practitioners were immunized against Hepatitis B and only 36.66% know their hepatitis B antibody titer.

**Conclusion:** The results of this study indicates that dental students in Karachi have some knowledge of NSIs. Nevertheless majority of them failed to recognize appropriate management and reporting of such injuries, therefore, there is a need for improvements in the clinical training, in particular more instructional time devoted to prevention and management of NSIs.

**Key Words:** Needle stick injury, immunization, dental health care workers

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## INTRODUCTION

Accidental exposures to blood-borne pathogens following a needle stick injury is the most common occupational health accident in medical care.<sup>1,2</sup> Needle stick injuries are common among dental practitioners because of their work environment.<sup>3</sup> Exposure caused by needle stick injury, carries the risk of infection by blood-borne viruses such as hepatitis B, hepatitis C, and HIV.<sup>4,5,6</sup> Other less frequent blood-borne microorganism which can be transmitted via blood exposure include Cytomegalovirus, Epstein-bar virus, Parvovirus and Plasmodium etc.

According to WHO study the annual burden of health care workers exposed to blood borne pathogens include; 2.6% HCV, 5.9% HBV and 0.5% for HIV<sup>7</sup>. Nurses have the highest rate of needle stick injury among health care workers.<sup>8</sup>

The goal of this research is to find out the rate of needle stick injury in dental practitioners and to check the awareness level among dental health care workers. It also will help to find out the awareness of dental health care workers regarding the protocol for needle stick injury, their immunization status against HBV and to see how many infection control departments are working in the town and whether the practitioners are aware of them.

## MATERIALS AND METHODS

The study was conducted at Jinnah Medical and Dental College. The data was collected from five different dental colleges of Karachi (JMDC, FJDC, DIDC, LCMD and Hamdard).

A 15-item questionnaire was used to collect the data. To examine the research questions, data was collected from 180 respondents comprising of faculty and

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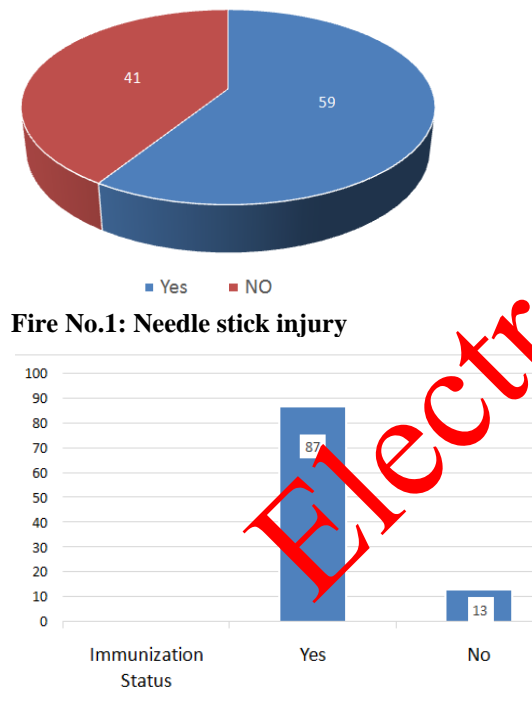
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graduates of the respective dental colleges (JMDC=50, FJDC=58, DIDC=53, LCMD=8 and Hamdard=11). The respondents filled the questionnaires in the presence of the researcher to expedite the process as well as to answer any potential inquiries. This study used simple random sampling procedure to gather an unbiased data from a large population. The data was stored in excel worksheet and analyzed using SPSS.

**RESULTS**

Out of the 180 dental practitioners evaluated for this research, 58.88% reported with a positive history of needle stick injury. Among these 27.77% have had the injuries multiple times. Multiple injuries occurred as frequently as 8.8% in a month to 11.66% within a year. Most prevailing cause of injury was individual carelessness in 31.66% of practitioners, other causes being poor disposal. Further on we found out that at the time of injury 54.4% of dental practitioners were wearing gloves and also that depth of injury was mostly superficial. Among these injured dental practitioners, 25.55% were injured by a new needle.



Upon further questioning, it was recorded that the protocol of needle stick injury was not known by all dental health care workers. As a result, only 81.11% of practitioners took immunization history, 30% practitioners got their blood screening done after the injury, only 22.77% practitioners received medical attention after the injury and 45.55% practitioners did not even make their patients undergo screening. To top it all, 52.22% dentists had no awareness about infection control department. It has been documented that 86.66% dental practitioners were

immunized against Hepatitis B and only 36.66% know their hepatitis B antibody titer. This study thus proves that needle stick injury is a neglected topic in this part of the world. Therefore practicing dentists should be constantly sent reminders about prevention and measures to be taken after the injury.

**DISCUSSION**

The incidence of NSIs in this study was 58.8%, which when compared with other countries like in France it was 24%,<sup>9</sup> in USA it was 30–33%,<sup>10,11</sup> in UK it was 12–33%<sup>12</sup> and in Singapore it was 35%.<sup>13</sup> Although blood contacts with skin and mucous membranes may be reduced through use of traditional barriers, such as gloves which reduces the inoculum of blood when the needle pass through glove, these barriers are not effective in preventing injuries with sharp instruments. Like in our study, gloves were worn by 54.4% dental practitioners whereas, 38% were not wearing gloves at the time of injury. Injuries in a dental college are due to many causes. Some are related, directly or indirectly to patient treatment. Others occur during preclinical laboratory exercise or in a dental laboratory. In our study 3.3% reported the cause to be poor disposal, individual carelessness in 31.66%, whereas 16.11% could not remember and there were 7.2% dental practitioners who stated there were some other causes of injury besides the ones mentioned above. The dental practitioners always carry this fear of contracting infections like HIV, HBV and HCV. The impact of NSI can be severe and carry a burden of insecurity of losing the career and sometimes life.<sup>14</sup> This leads to underreporting of the injuries which is well documented in literature.<sup>15</sup> Vaccination rates compared favorably with those seen in other studies (percent of vaccination). Previous investigation of NSIs among Australian medical and dental students showed their hepatitis B vaccination rates to be 98% and 95%, respectively.<sup>16</sup> Whereas our study showed that 86.67% of operators were immunized. Such a result would be particularly desirable, as hepatitis B is one of the major infectious disease threats for health care workers. This study showed that 8.33% of operators were not immunized against HBV. This is a serious deficiency which need strict monitoring and reinforcement. These non-vaccinated students carry 6-30% risk of becoming infected with the blood borne virus due to NSI.<sup>17</sup> This is evident from our data that 47.16% of the operators have had needle stick injury multiple times which increases their risk of infection by many folds. The results of this study revealed that post-exposure management was completely inadequate. 92.77% of practitioners were aware of the NSI protocol, still 40% of them did not receive any medical attention after exposure. Majority of them did not get their or

patient's screening after injury. It is important that such protocol and post-exposure incident services be introduced to students at the time of their orientation before they begin their clinic experiences. Access to such programmes should be readily available and rapid so that the time between exposure and post-exposure prophylaxis is as short as possible.

The prevention of NSIs remains a key in minimizing the risk of transmission of blood-borne viral infections. To that end, there is a need to invest resources into educating students on the proper use of devices, focusing on administration of local anesthetic, recapping the needle, changing the anaesthetic carpule, proper disposal of sharp instruments and cleaning of instruments, as these factors contributed to a significant proportion of injuries among dental professionals in this study. These measures, if reinforced in dental school, will have a greater chance of being followed once the individual moves into private practice.

## CONCLUSION

The results of this study indicates that dental students in Karachi have some knowledge of NSIs. Nevertheless majority of them failed to recognize appropriate management and reporting of such injuries, therefore, there is a need for improvements in the clinical training, in particular more instructional time devoted to prevention and management of NSIs. In addition, to education, competence based training should be considered. They should also be made aware of the current procedure and protocol and need support and counselling by their Awareness and Control Department.

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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