

Prevalence of Percutaneous Injuries among Dentists in Palestine: A Cross Sectional Study

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Abstract Dentistry is a profession which commonly deals with contact of secretions from the oral cavity. Percutaneous injuries can further accentuate the dentist's risk for diseases such Hepatitis B and HIV. Hence we conducted a study which aimed to assess the prevalence of percutaneous injuries and the associated factors among dentists. A total of 300 dentists from Palestine were requested for an online survey regarding percutaneous injuries, among which 201 dentists responded. Demographic data, Hepatitis B vaccination status, use of personal protective barriers and incidences of percutaneous injuries from dental instruments were assessed. The prevalence of percutaneous injuries was 90% among the dentists. 97.5% of the dentists were vaccinated against Hepatitis B. However, only 87% had received all the three recommended doses. Percutaneous injury was more common with probes/ explorers, endodontic files and needles in the decreasing order, accounting to 31.3%, 31% and 26.6% respectively. Hence the study showed that the prevalence of percutaneous injuries was high among dentists and it is necessary to emphasize the importance of personal protective barriers and vaccination against Hepatitis B.

Keywords: *injuries, hepatitis, dental injuries, percutaneous*

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1. Introduction

The profession of dentistry is well known for its regard and human service. However, a plethora of occupational health hazards still pose a threat to the modern dentist. One of them being percutaneous injury, as it poses a great risk for developing Hepatitis B, Hepatitis C and HIV [1,2]. HCV is a leading cause of chronic hepatitis and cirrhosis [3], and to date there is no protective vaccine against HCV. Thus, it is extremely important to arm ourselves with strategies to monitor and manage percutaneous injuries among dentists. The extent to which practicing dentists follow recommendations to minimize their risk of a needle-stick injury varies. Neither the magnitude of the risk of needle stick injury nor the practices associated with it have been defined [4,5,6]. However, the transmission risk is influenced by the type and number of microorganisms present in the blood, presence of visible blood on the needle, depth of the injury and size and type of needle used [7].

More commonly sharps injuries among dentists have been reported to be common with the use of burs in various studies [8,9]. The one that needs more concern is the needle stick injury, which usually occurs when giving injections with residual body fluid, still present in the needle. This greatly increases the chance of transmission of diseases and hence adequate precautions should be taken to avoid them by following universal precautions,

personal protective barrier usage and effective sharps waste disposal management. Hence, it becomes very important to assess the prevalence of percutaneous injuries among dentists and its associated risk factors. Although percutaneous injury among dental health care workers has been widely explored in several western nations, very few data are available from Middle Eastern countries. No data have been reported on percutaneous injuries among dentists in Palestine. Therefore, this study aims to assess the prevalence of percutaneous injuries and associated factors among dentists in Palestine.

2. Materials & Methods

The study was a cross sectional study with a sample population of 300 Palestinian dentists practicing in Palestine. The study was conducted through an online survey among the dentists registered with Palestinian Dental Association. Among the 300 dentists who were requested for the online survey, 201 dentists responded to complete the questionnaire (n=201). The study was approved by the ethical committee. A structured, self-administered questionnaire was designed to assess the prevalence of percutaneous injuries among dentists. The questionnaire sought information about sociodemographic characteristics such as age, sex, years of experience and type of practice. The questionnaire assessed Hepatitis B vaccination status, serum conversion test status, use of personal protective barriers such as masks, gloves & head

cover, and incidences of percutaneous injuries from dental instruments.

The definition of a percutaneous injury was any injury of any depth caused by a small, medium or large bore hollow syringe needle, endodontic file, probe, explorer, curette, scaler or dental bur which did or did not involve visible blood at the time of injury. A yes/no response was used to report the same. A written consent to participate in this study was obtained. The respondents were assured about confidentiality.

3. Statistical Analysis

Continuous variables were described using mean and standard deviation (SD). All categorical variables were described using frequency tables. Descriptive analysis was used to compare the association between independent variables. The chi-squared test was used to assess the association between categorical independent variables and being injured. The level of significance was set at $p < 0.05$.

4. Results

Out of 300 dentists who were requested for the online survey, 201 dentists responded accounting the response rate to be 67%. Of the 201 dentists who participated in the study, 123 were females (61.2%) and 78 (38.8%) were males. Considering their experience, 117 dentists had less than 5 years' experience (58.2%), 69 had experience between 6 to 9 years (39.2%) and 15 dentists had experience for more than 10 years (7.5%). Based on practice, it was noted that dentists in public practice and dentists having specialty practice had increased prevalence rates of percutaneous injuries compared to their

counterparts of private practice and general dentistry practice respectively [Table 1]. A total of 196 (97.5%) dentists had been vaccinated against HBV infection. However, only 175 dentists (87%) had completed the recommended three doses of the vaccination. Frequency of percutaneous injuries among dentists in Palestine by demographic characteristics, practice type and vaccination status has been shown in Table 1.

Percutaneous injury was reported among 181 out of 201 dentists accounting to 90% prevalence rate [Figure 1]. Percutaneous injury was more common with probes/explorers, endodontic files, needles, curette/scaler, burs and blades in the decreasing order, accounting to 100 incidents (31.3%), 99 incidents (31%), 85 incidents (26.6%), 14 incidents (4.4%), 14 incidents (4.4%) and 7 (2.2%) incidents respectively [Figure 2]. It was also noted that dentists used personal protective barriers such as gloves (99%) and masks (76.6%) more than eye goggles (1.5%) and head cover (0.1%) [Figure 3].

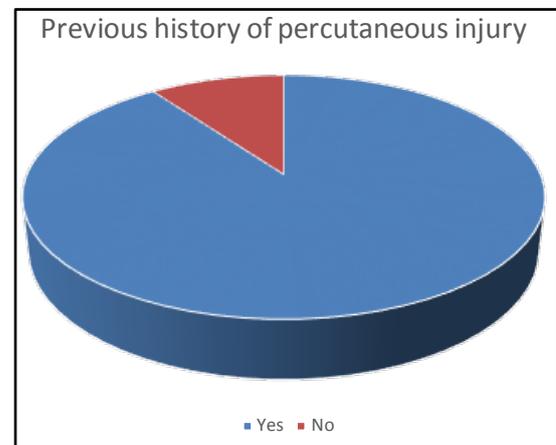


Figure 1. Previous history of percutaneous injury

Table 1. Frequency of percutaneous injuries among dentists in Palestine ($n = 201$) by demographic characteristics, practice type and vaccination status

	Injured No.	Injured %	Not injured No.	Not injured %	P value
Male	67	85.9%	11	14.1%	0.14
Female	114	92.7%	9	7.3%	
Hepatitis-B vaccinated	176	89.7%	20	10.2%	0.35
Non- vaccinated	5	100%	0	0%	
Less than 5 years	109	93.2%	8	68.4%	0.12
6-9 years	57	82.6%	12	17.4%	
More than 10 years	15	100%	0	0%	
Private practice	172	89.6%	20	10.4%	0.35
Public practice	9	100%	0	0%	

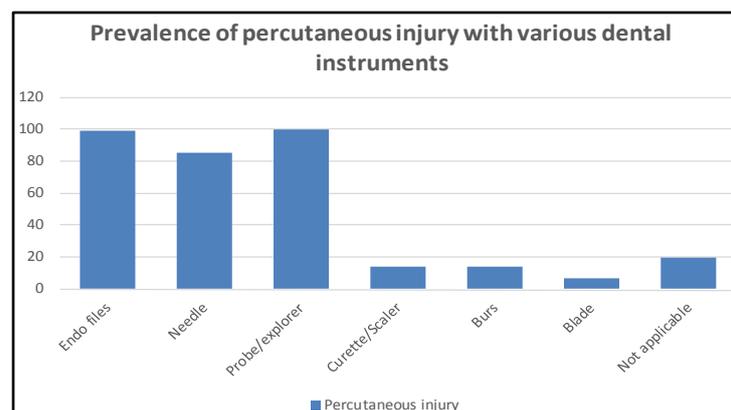


Figure 2. Prevalence of percutaneous injury with various dental instruments

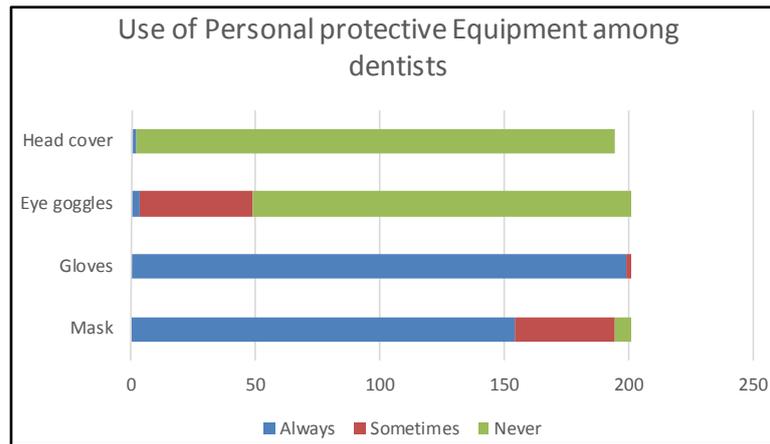


Figure 3. Use of personal protective Equipment among dentists

5. Discussion

Percutaneous exposure incident is a broad terminology that includes needle stick and sharps injuries, as well as cutaneous and mucous exposures to blood and serum. They represent the most efficient method for transmitting blood-borne infections between patients and health care workers. In our study we have shown a prevalence rate of 90%. Similar prevalence rates have been shown in different studies. A similar study from Jordan, revealed a prevalence rate of 66.5% of needle stick injuries among dentists [10]. Previous studies suggest that about half of all dentists report percutaneous injuries, particularly needle stick and sharps injuries, in both the United Kingdom [11] and in Thailand [12]. Only 14% of dentists reported needle stick injuries in a South African survey [13]. In a recent Australian study, the prevalence of needle stick injury was 28%, in particular needle stick injury contaminated by exposure to the patient's bodily fluids was 16% [8]. This may be relatively low compared to other published surveys of dentists which reported higher prevalence [11,12,13].

Needle stick and sharps injuries were, however, found to be common among dental students with 72% of dental students indicating a "sharps" injury of some description during their clinical training [14]. Dental students and dental assistants were found to have the highest rates of exposure in US studies, mainly due to syringe needle injuries [15,16]. A recent study from Brazil showed 59.8% prevalence rate of percutaneous injuries among dentists. A 10-year review of the literature indicated that percutaneous injuries may have been steadily declining [17]. Nevertheless, it is important that dentists continue to follow strict infection control guidelines for glove tears, and ensure that skin cuts and grazes are covered by waterproof dressings in the event of bodily fluid penetrating the gloves [18,19,20]. The limitation of the study is that we have considered the sample collection at a cross sectional level and hence further studies should be conducted with a larger sample size and longitudinal study design to conclude definitively.

6. Conclusion

This study has rightly thrown light on the need for safer work practices and instrumentation and continued worker

education, with particular regard to post-treatment handling of sharp dental instruments and equipment, which may reduce occupational blood exposure among dentists in Palestine. The vitality of the present topic cannot be ignored, as the study presents with an increased prevalence of percutaneous injuries among dentists in Palestine and the need to emphasize on universal safety precaution guidelines, Hepatitis vaccination and the importance of personal protective barriers.

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