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Analysis of injuries by the needlestick or sharp instruments in dental interns at a medical university hospital

Occupational safety, health, and well-being are very important to support the fields of occupational, environmental, and mental health for health workers. Dentists as well as dental students are exposed to highly stressful environments which might result in higher risk of burnout and even depression.¹ Without proper practice and lack of enough clinical experiences will evoke stress and anxiety of dental interns and novice dentists. In dentistry, dental professionals face a risk of injury such as needlestick and sharp instruments in clinical workplace, decontamination unit, and supply room. The potential consequences of occupational exposure to transmitted or infected blood-borne pathogens would be harmful to health and even life threatening. The most incidents of dental professionals with less work experience tend to cause sharp injuries. The purpose of this study was to analyze the characteristics of injury by the needlestick or sharp instruments in dental interns.

In the study, the analysis of sharp injuries was conducted at Department of Dentistry, Chung Shan Medical University Hospital, Taichung, Taiwan. The incident reports were obtained from dental administration office from 2020 to 2022. As shown in Table 1, a total of 15 incidents were reported during the past three years. Concerning the sharp injury, the accidents caused by the needlestick were 9 cases (60%) and those caused by the sharp instruments were 6 cases (40%). In addition, 10 accidents happened during a surgical procedure. The other 5 events occurred in the cleanup process. Concerning the factor of location, the majority (9/12, 75%) of accidents of sharp injury occurred at the outpatient department.

Recently, an epidemiological survey found that the needlestick injury among dental students during clinical training were approximately 36.2% in Mainland China.² Similar findings were shown that dental intern was the top one victim of needlestick and sharps injuries at one university hospital in Taiwan.³ In this study, the ratio of injury by needlestick and sharp instruments was gradually raised during past three

Table 1 Analysis of injuries by the needlestick or sharp instruments.

Year	Case	Sex	Location	Cause	Type of procedure
2020	No. 1	Male	OR	Surgical instrument	Treatment
	No. 2	Female	OPD	Surgical instrument	Cleanup
	No. 3	Male	OPD	Needle	Treatment
2021	No. 1	Female	OPD	Surgical instrument	Treatment
	No. 2	Male	OPD	Needle	Treatment
	No. 3	Male	OR	Needle	Treatment
2022	No. 1	Male	OPD	Needle	Treatment
	No. 2	Female	Supply room	Surgical instrument	Cleanup
	No. 3	Female	OPD	Needle	Treatment
	No. 4	Female	OPD	Needle	Cleanup
	No. 5	Male	OPD	Surgical instrument	Treatment
	No. 6	Female	OPD	Needle	Cleanup
	No. 7	Female	OPD	Needle	Cleanup
	No. 8	Male	OPD	Needle	Treatment
	No. 9	Female	OPD	Surgical instrument	Treatment

OR: operation room.

OPD: outpatient department.

<https://doi.org/10.1016/j.jds.2023.06.016>

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years. The peak of sharp injuries was shown in 2022. The reasons may be explained as follows. The face-to-face teaching and educational activities of pre-clinical dental curriculum were interrupted.⁴ Fully-virtual courses or hybrid-teaching program were adapted in dental schools. Lack of simulation laboratory learning courses actually reduce the opportunity to hone the dental students' pre-clinical skills. Therefore, the implementation of haptic virtual reality simulator into dental curriculum to facilitate pre-clinical skill before clinical training is very important either during COVID-19 pandemic or post pandemic era.⁵ The unlimited practice could not only enhance skill but also boost future occupational safety. Moreover, education or didactic teaching during undergraduate years is important to delivery and support infection control as well as safety systems.

Taken together, it is necessary to establish standard operating procedure for sharp safety in clinical dentistry, not only for dental interns but also for the whole dental team. In addition, the longitudinal follow-up and the characteristics of dental incidents for improving the quality and safety of dental healthcare providers are required in the further studies.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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Received 15 June 2023

Final revision received 15 June 2023

Available online 23 June 2023