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## Research Article

### OCCUPATIONAL ACCIDENTS WITH STUDENTS IN DENTISTRY DURING CLINICAL ACTIVITIES: A RELEVANT PROBLEM

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#### ABSTRACT

Dental students are in a group more prone to occupational accidents during clinical care because they are in the process of learning, presenting clinical inexperience and limited development of abilities, as well as working in a complex region and with a great presence of microorganisms. Thus, this study aims to analyze the history of occupational accidents in a dental school, as well as to verify which organs and dental materials were more prone to the occurrence of these accidents, in addition to the vaccination status of the injured students. For the development of this research, medical records were consulted for all dental students of the FCMS / JF who suffered accidents during clinical care between the years of 2012 and 2017, excluding students who had incomplete medical records. The results indicated a total of 75 accidents in the above-mentioned period, with a higher incidence of accidents in the school clinic of HMTJ (63). The anesthesia needle was the material with the highest accident rate (34.66%), consisting of the majority of the recurrences of the second left chirodactyl (22.66%), with 72% of the sample having a complete vaccine card. It is concluded that the great occurrence of accidents with students of dentistry is related to negligence regarding the biosafety and immunization norms, leading to injuries mainly affecting the chirodactyls by anesthesia needles.

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#### INTRODUCTION

Dentistry is a profession in which it requires the direct contact of clinical instruments liable to contamination by biological materials since the development of skills in undergraduate years<sup>11</sup>. As a result, because they have inexperience in the use of materials, limited development of manual skills and indiscriminate use of personal protective equipment (PPE), students fit into a group more prone to occupational accidents<sup>2,8,18</sup>.

The possibility of exposure to pathogens transmitted mainly by blood and salivary fluids is one of the threats of greater preponderance to the future dental surgeons during the clinical care stages. Due to this, in recent years, concern about Acquired Immunodeficiency Syndrome (AIDS), Hepatitis B and Hepatitis C has led to the development of research on the occurrence and prevention measures for such diseases<sup>7,15,9,5</sup>. Materials such as syringe needles, suture needles, scalpel blades, exploratory probe and drill bits used in motors are considerable sources for the occurrence of disasters in the care of patients by undergraduate dentistry students, which may lead to the contamination of pathological agents<sup>19</sup>. This can be

illustrated by a study by Sacchetto *et al.* (2013)<sup>16</sup>, which states that one of the main methods of contamination by the Hepatitis B virus is through accidental punctures with needles, recommending that in addition to the immunization against the disease the proper use of personal protective equipment be used to prevent contamination. The area of practice of dental surgeons and dentistry students in clinical care has a complex nature, variable shapes and dimensions and is often difficult to see or access. Moreover, such structures, especially those related to the oral cavity, have a high percentage of microorganisms that can cause infections, since their handling requires a considerable ability of the operator for the physical proximity between the professional and the patient, and a handling of complex and sharp instruments, which increases the risk of accidents in dental apprentices<sup>10,4</sup>. The report of occupational accidents occurring during dental care has great importance, as they evaluate the main factors related to its occurrence. Through these sources, possible strategies can be elaborated, precautions can be suggested and the dispersion of such information to other institutions can be achieved, aiming to avoid such incidents and to bring benefits to students, patients, employees and professors.

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Considering that, according to the critical literature, precautions regarding the handling of dental instruments are essential for the prevention of the development of infectious-contagious diseases. It is necessary to contribute to the scientific community by means of evidence that seek the exposure of occurrences of accidents at the academic level, in order to foster the search for the necessary care during clinical procedures and to encourage the work carried out through the principles of biosafety.

Thus, this study aims to analyze the history of occupational accidents occurred with dental students in clinical activities belonging to a dental school in the city of Juiz de Fora, MG, Brazil, as well as to verify which organs and dental materials were more prone to occurrence of these accidents, besides the vaccination situation of the injured students.

**METHODS**

For the development of this research, an opinion was issued by the Ethics and Research Committee of the Faculty of Medical Sciences and Health of Juiz de Fora - FCMS / JF - SUPREMA No. 2,545,972. For the beginning of the methodology itself, the students belonging to the FCMS / JF who suffered accidents with contaminated materials during the dental clinic of the Theresinha de Jesus Hospital and Maternity Hospital (HMTJ) were selected and during the supervised internship at the Center of Dental Specialties Southern Unit (CEO Sul) in the city of Juiz de Fora in the period between 2012 and 2017. However, participants were excluded from this analysis whose records did not present information about which organ was affected and which material was responsible for the accident during dental care.

In order to collect the data, the HMTJ work safety sector was consulted for the collection of information from a record of accidents with dental students injured during clinical activities between the proposed period. Therefore, the variables selected for the analysis were: total number of accidents in the proposed period, organs affected by the accident, causative materials and the vaccination status of those selected. Subsequently, a quantitative and qualitative analysis was performed for the counting and interpretation of the variables selected from the data collection.

**RESULTS**

The number of accidents occurred during the proposed period totaled seventy-five, and the number of accidents occurred in the HMTJ school clinic (sixty-three) considerably higher than those occurred in the Southern CEO (twelve), according to figure 1.

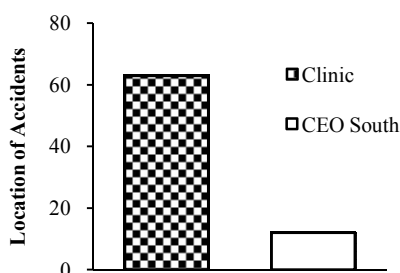


Figure 1 Quantitative of occupational accidents in dentistry academics distributed by place of performance.

In addition, in respect to the object that caused the accidents, the anesthetic needle was the predominant object (34.66%), followed by the disposable syringe needle (16%) and dental drills (13.33%). Regarding the anatomical parts affected, the second left chirodactyl was the most affected (22.66%), followed by the first right chirodactyl (17.33%) and second right chirodactyl (10.66%). Both situations can be illustrated in table 1.

Table 1 Percentage of occupational accidents in dentistry students according to the causative object and part of the body affected.

	n = 75	%
Causative Object		
Anesthesia Needle	26	34,66
Drill	10	13,33
Curette	2	2,66
Disposable Syringe Needle	12	16
Scalpel blade	4	5,33
Explorer probe	4	5,33
Suture Needle	4	5,33
Endodontic Lima	5	6,66
Ultrasound Catheter	3	4
Secretion, Blood and / or other Contaminated Liquids		
Young Arch	1	1,33
Dentine Spoon	1	1,33
Part of the Body Affected		
First Right Chirodactyl	13	17,33
Second Right Chirodactyl	8	10,66
Third Right Chirodactyl	5	6,66
Fourth Right Chirodactyl	2	2,66
First Left Chirodactyl	7	9,33
Second Left Chirodactyl	17	22,66
Third Left Chirodactyl	6	8
Fourth Left Chirodactyl	1	1,33
Left Hand	4	5,33
Right Hand	4	5,33
Right arm	3	4
Mucosa Ocular	3	4
Left Foot	2	2,66

In relation to the vaccination situation of the academics, it was found that fifty-four (54%) had the complete vaccine card, seventeen (17%) with the incomplete card (22.66%) and four (5.33%) did not know did not present the card regarding their immunological status, according to figure 2.

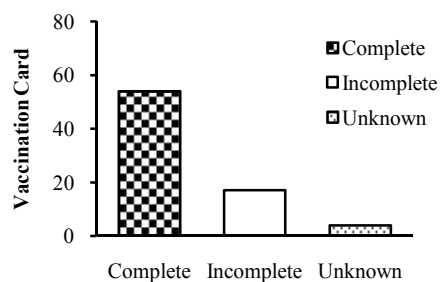


Figure 2 Vaccination status of dental students who had occupational accidents.

**DISCUSSION**

The results found from the analysis performed showed that occupational accidents occurred in dental clinics in the undergraduate program is problematic regarding the biosafety of the academics. In this research, a total number of seventy-

five accidents in a period of 5 years was found, which eludes to a high proportion between these two variables.

Students' knowledge of the risks and consequences they may suffer from an accident with contaminated dental materials is of utmost importance for the prevention of student integrity in clinical activities. In light of the analysis of student medical records, students' neglect of clinical stipulated by the biosafety principles of Norma Regulamentadora 32 (NR-32)<sup>13</sup> was the main factor for the occurrence of accidents, as shown in the reports of certain students who manually discarded sharp objects, manually reattached needles and performed erroneous hygiene of contaminated materials.

In addition, knowledge of post-accident prophylactic measures is essential for the prevention of infectious-contagious diseases<sup>6</sup>. However, these measures are routinely neglected, as shown in the study by Orestes-Cardoso *et al.* (2009)<sup>14</sup>, who, through a data collection in a dental school, showed that only 13.2% of the injured people sought specialized medical service, even with the majority of respondents (88.7%), claiming to have reasonable to good knowledge in relation to the necessary measures post-accident.

Regarding the materials that caused the accidents, there was a preponderance of sharp objects, with anesthesia needles and disposable syringe needles being the most prevalent among the other instruments, which demonstrates a greater need for care in the handling of these materials. According to NR 32, manual recapping and disconnection of needles are prohibited shortly after use. However, one of the main reasons for the occurrence of these accidents of this nature are the paradoxical behavior implied by regulatory norm. In addition, the study by Malik *et al.* (2012)<sup>12</sup>, through a questionnaire applied to 100 volunteers, showed that 88% of the sample believed in the success of needle recapping shortly after its use. However, of the total number of interviewees, 30% came to be affected by these materials, even 74% being aware of the universal safety guidelines.

Direct exposure of the anatomical organs of dentistry academics is one of the means to compromise their respective health states from contamination of contaminated materials. Within the sample studied, the chirodactyls were the organs most affected by the infected instruments, therefore being, anatomical sites more susceptible to the entry of microorganisms that cause infections. One of the ways to reduce cases of accidents and consequently infectious diseases is the use of safety syringes in clinical procedures, which have as one of their foundations, according to evidence, reduce the incidence of injuries by sharps in the health field, both in the operator and in the patient, and should be combined with training that ensures its correct use<sup>1, 17, 20</sup>.

The presentation of the vaccination status for the accomplishment of the clinical activities by the academics is of paramount importance for their safety as to the risks in which they are exposed to during the dental practice, since through the immunization one has the prevention of the development of infectious diseases. According to the findings regarding the presentation of vaccine cards of the injured students, it was verified that about 28% of them were in default regarding the immunization of infectious-contagious diseases. Failure to comply with this action may be related to the student's lack of

knowledge about the importance of the preventive program for diseases such as hepatitis B, for example, cited in the study by Sacchetto *et al.* (2013)<sup>16</sup>, which, based on an analysis of a sample of 179 volunteers, found that less than half (48.6%) of the students knew about the objectives of the Anti-HBs test.

## CONCLUSION

This study concluded that the great occurrence of occupational accidents in dental students in clinical activities is related to attitudes that neglect the correct work ethic within the biosafety and immunization norms, which leads to sharps injuries mainly in the chirodactyls, being the needle the main aggressor agent, and consequently to a work of inspection as to the contagion of infectious diseases.

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