

# Accidents with cutting and piercing materials among Dentistry students

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## ABSTRACT

Health professionals are exposed to the most diverse occupational risks during their workday and dentists lead the number of accidents with biological materials. The assistance provided by dental students leaves them exposed to occupational risks in a similar way to professionals in the field. This study aimed to evaluate the prevalence and characteristics of accidents with cutting and piercing instruments among students of a Dentistry course. There was a prevalence of 28.85% of accidents, with the highest percentage in the 5th period of the course, mainly in the Surgery and Endodontics clinics. Only 20% of those affected reported the occurrence and the sickle probe was the instrument most involved. In addition, accidents occurred equally in patient care and washing of instruments. Therefore, it is necessary to invest in permanent educational and normative actions to raise the awareness of students about needlestick injuries.

**Descriptors:** Students, Dental. Biosafety. Occupational Risks. Coronavirus.

## 1 INTRODUCTION

Accidents with sharps regularly involve pathogenic biological agents capable of causing diseases, due to the presence of bacteria, viruses

and fungi<sup>1</sup>. Dental surgeons are vulnerable, as there is a high risk of contamination by communicable diseases during care, such as influenza, pneumonia, hepatitis B and C,

conjunctivitis, herpes, tuberculosis, syphilis, acquired immunodeficiency syndrome (HIV/AIDS)<sup>2</sup> and, currently, coronavirus disease (COVID-19)<sup>3</sup>.

Health professionals are exposed to the most diverse occupational risks during their workday, whether physical, chemical, mechanical, psychosocial or biological<sup>4</sup>. In Dentistry, works are subject to numerous forms of contamination, due to the use of sharp instruments and equipment that produce aerosols, as well as the contact with body fluids<sup>4</sup>.

The care provided by dental students leaves them exposed to occupational risks in a similar way to professionals in the field, as they perform several procedures with different levels of complexity, but with technical skill in development<sup>6</sup>, presenting a higher rate of accidents when compared to academics of courses in Pharmacy, Nursing and Medicine<sup>7</sup>.

The high prevalence of occupational accidents among dentistry students is worrying<sup>1</sup>. It is necessary to pay close attention to the exposure to biological material in dental school clinics<sup>8</sup> and the use of specific preventive measures, such as vaccination against Hepatitis B, triple viral and double adult type, hand washing, disinfection and sterilization of instruments and the use of complete and adequate personal protective equipment<sup>1</sup>, disinfect surfaces, use physical barriers on equipment, keep disposal boxes in visible places and properly dispose of generated waste<sup>8</sup>.

Thus, occupational accidents must be prevented and analyzed both in the professional environment and among university students through the dissemination of methods that emphasize the importance of biosafety, the correct handling of biological instruments and materials, complete immunization and how to proceed in cases of accidents<sup>9</sup>.

This study aimed to evaluate the

occurrence rate and the characteristics of accidents involving cutting and piercing instruments among students of the Dentistry course at the State University of Piauí (UESPI), Campus Professor Alexandre Alves Oliveira, Parnaíba.

## 2 METHODS

All procedures in this study followed the ethical principles established by current legislation, and the project was approved by the Research Ethics Committee of UESPI under the protocol number 1.643.862.

A cross-sectional, descriptive study with a quantitative approach was designed, carried out with students from the Dentistry course at UESPI, Campus Professor Alexandre Alves Oliveira, Parnaíba. Students duly enrolled in dental clinic activities from the 5th period were included.

The instrument for data collection consisted of a standardized, self-administered, semi-structured questionnaire developed by the researchers, covering the history of needlestick injuries during clinical activities; knowledge of immediate prophylactic post-accident conducts; knowledge, risk perception and formally recommended clarifications and protective measures.

The questionnaire application time was approximately 15 minutes. Data were tabulated and analyzed using descriptive statistics.

## 3 RESULTS

Of the total number of students enrolled in clinical activities (n=58), six did not accept to participate in the research, leaving the final sample with 52 participants. Accidents were reported by 15 (28.85%) students, 10 (66.66%) from the fifth period, 04 (26.67%) from the seventh period and 01 (6.67%) from the ninth. It is clarified that the institution promotes only one

entry/year, which results in alternating blocks per semester.

The greatest number of accidents occurred in the disciplines of Surgery (n=6, 40%), Endodontics (n=5, 33.33%), Restorative Dentistry (n=2, 13.33%), Operative Dentistry (n=1, 6.67) and Periodontics (n=1.67).

It was observed that 32 (61.53%) of the students stated that there was a theoretical deficiency in relation to the actions to be taken in cases of accidental exposure to contaminated sharps. In the survey conducted at UESPI, only 3 (20%) of the students reported the accident, but even so, they did so to the professor of the discipline and not to Organs competent bodies.

Regarding the instruments/material involved in the accident, the exploratory probe caused the most accidents (n=7, 46.67%), followed by the needle (n=4, 26.67%) and the endodontic file (n =2, 13.34%); while drills and curettes were responsible for 1 (6.66%) accident each. Of the total number of accidents, half occurred during patient care and half during instrument washing.

#### 4 DISCUSSION

Biosafety proposes to professionals and academics measures and practices so that they can safely develop their work activities, reducing or eliminating the risks inherent to clinical care, in order to preserve the health of those involved<sup>10</sup>. The risk of occupational accidents among dentistry students can be associated with the emotional state facing the service, rush to complete the procedure, inexperience in handling items and dental instruments, ignorance of biosafety standards or negligence to the risks of exposure. Undergraduate students suffer up to twice as many accidents as dentists graduated ten years ago<sup>11</sup>.

Even with disciplines that modulate the conduct of future professionals, accidents with

sharps still occur, as a result of failure in biosafety care, a fact that is worrying, because even with little time of clinical activity, approximately one of every four students has already been exposed to the material. potentially contaminated biological agent, which can lead to life-threatening diseases, such as hepatitis, HIV/AIDS<sup>12</sup> and COVID-19<sup>7</sup>.

In the literature, we found the largest number of accidents in an integrated clinic, followed by Surgery, Dentistry, Endodontics and Clinical Prosthesis<sup>6</sup>, in part agreeing with this study, which observed that there were more accidents in the disciplines of Surgery and Endodontics.

The inexperience on the part of the academic can somehow contribute to the occurrence of incidents with sharps, as accidents are related to the peak of anxiety, due to patient care, high workload, inexperience, stress, poor field of vision, lack of attention to biosafety and lack of skill<sup>13</sup>. This statement is confirmed while most accidents happened in the first semester of clinical care, in which clinical experience was insufficient to ensure greater safety for students. Hbibi et al. (2018)<sup>14</sup> also observed that the highest frequency of occurrences occurred among students in the first year of clinical practice.

It was identified that 32 (61.53%) of the students have a theoretical deficiency in relation to the conduct to be taken in cases of accidental exposure to contaminated sharps, a conduct that begins with the formal notification in a standardized form that aims to exemplify the characteristic of this incident with sharps, in agreement with a study by Hbibi et al. (2018)<sup>14</sup> and Armond et al. (2016)<sup>19</sup>, who found that students did not know how to behave in the face of an accident with biological material and/or had little knowledge about the management and risks of occupational accidents.

In the present study, only 3 (20%) students reported the accident, but they did so to the professor of the discipline and not to Organs competent bodies, in disagreement with what is recommended by the Ministry of Health, which provides guidance to be followed in health institutions throughout the country. country, that work accidents involving blood and other potentially contaminated fluids are treated as cases of medical emergency<sup>15</sup>. This situation coincides with that of other studies that indicate that many academics and even professionals do not notify or do not follow the post-exposure protocol<sup>16</sup>.

In the literature, accidents occur during clinical care and sterilization, the most mentioned instruments are anesthetic needles, periodontal curettes, sickle probes and drills<sup>13</sup>, in agreement with the results found in this research.

It is observed, therefore, that there is a need to implement permanent educational actions with an emphasis on prevention, awareness and monitoring of cases of occupational accidents, in addition to improving preventive practices and conducting periodic training<sup>17</sup>. Standard precautions are forms of prevention to be employed in the use of barriers or use of personal protective equipment to assist all patients, prevention in the handling of blood, secretions and excretions and contact with mucous membranes and non-intact skin, prevention of sharp accidents, proper handling in decontamination and disposal procedures<sup>18</sup>. Accidents with exposure to contaminated materials should receive more attention in the reformulation of biosafety protocols so that they are complete and more didactic within the institution itself, for adequate training of professionals in training<sup>19</sup>.

## 5 CONCLUSION

It was found that, even though there are

disciplines that address biosafety content, a considerable number of students have had accidents with sharps. The data indicate that the accidents occurred with students from the fifth period and in the disciplines of Surgery and Endodontics.

## RESUMO

### Acidentes perfurocortantes entre acadêmicos de Odontologia

Os profissionais da saúde estão expostos aos mais diversos riscos ocupacionais durante a sua jornada de trabalho e os cirurgiões-dentistas lideram o número de acidentes com materiais biológicos. Os atendimentos por acadêmicos de odontologia os deixam expostos aos riscos ocupacionais de forma semelhante aos profissionais da área. Este estudo teve o objetivo de avaliar prevalência e características dos acidentes com instrumentais perfurocortantes entre os acadêmicos de um curso de Odontologia. Constatou-se prevalência de 28,85% de acidentes, com o maior percentual no 5º período de curso, principalmente nas clínicas de Cirurgia e Endodontia. Apenas 20% dos afetados relataram a ocorrência e a sonda exploradora foi o instrumental mais envolvido. Além disso, os acidentes ocorreram de forma igual no atendimento ao paciente e lavagem do instrumental. Portanto, faz-se necessário investimento em ações educativas e normativas permanentes para conscientização de acadêmicos sobre acidentes perfurocortantes.

**Descritores:** Estudantes de Odontologia. Biossegurança. Riscos Ocupacionais. Coronavírus.

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