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# Prevalence of dental trauma in disabled persons seen at the dental clinic for special-needs patients of the Catholic University of Brasília (UCB)

*Prevalência de traumatismo dentário em pacientes com deficiência atendidos na clínica de pacientes especiais da Universidade Católica de Brasília (UCB)*

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## Resumo

**Introdução:** No Brasil, o traumatismo dentário (TD) é considerado um problema de saúde pública. No entanto, poucos estudos na literatura relatam a prevalência de TD em pessoas com deficiência (PD). **Objetivo:** O objetivo deste trabalho foi avaliar a prevalência de TD em PD atendidas na Clínica de Pacientes Especiais da Universidade Católica de Brasília (COPE). **Material e método:** Este estudo seguiu um delineamento descritivo e retrospectivo, e foi realizado por meio da análise de 73 prontuários de PD atendidas na COPE entre 2014 e 2016. Foram coletados dados sociodemográficos e clínicos. O teste t foi utilizado entre as proporções para determinar se houve diferenças significativas entre as categorias das variáveis analisadas. O programa "Statistical Package for Social Sciences" (SPSS), versão 23.0 (IBM Corporation, Armonk, NY, EUA) foi utilizado nas análises ($p<0,05$). **Resultado:** Encontrou-se uma prevalência de TD de 33/73 (45,2%) entre os PD. A fratura predominante foi a do tipo coronária, com uma frequência de 26/33 (78,8%). A maioria dos pacientes tinha acima de 20 anos, com uma frequência de 63/73 (86,3%), significativamente maior do que as frequências das outras categorias ($p < 0,008$). Os pacientes da amostra apresentavam doenças variadas, sendo as mais prevalentes as das categorias mental, com frequência de 22/73 (30,1%), múltipla com 19/73 (26%), e sistêmica com 14/73 (19,2%). **Conclusão:** Foi encontrada uma alta prevalência de TD em PD, sendo a maioria dos casos relacionados a doenças mentais e múltiplas. Futuras pesquisas são necessárias para avaliar a prevalência de TD nesse grupo de pacientes em todo o Distrito Federal.

**Descritores:** Traumatismos dentários; pessoas com deficiência; assistência odontológica.

## Abstract

**Introduction:** In Brazil, dental trauma (DT) is considered a public health problem. However, few studies in the literature report the prevalence of DT in disabled persons (DP). **Objective:** The aim of this study was to assess the prevalence of DT among DP seen at the Dental Clinic for Special-Needs Patients (COPE) of the Catholic University of Brasília. **Material and method:** A retrospective, descriptive study analyzing 73 medical charts of DP seen at the COPE between 2014 and 2016 was conducted. Clinical and sociodemographic data were collected. The *t*-test was used to check for significant differences between the categories of the variables analyzed. The Statistical Package for Social Sciences (SPSS), version 23.0 (IBM Corporation, Armonk, NY, USA) was used for all statistical analyses ($p < 0.05$). **Result:** A DT prevalence of 33/73 (45.2%) was found among DP. The predominant type of fracture was crown fracture (26/33-78.8%). The majority of patients were over 20 years old (63/73 - 86.3%), at a proportion significantly higher than those for the other age categories ($p < 0.008$). The patients in the sample had a variety of diseases, predominantly in the following categories: mental (22/73- 30.1%), multiple (19/73-26%), and systemic (14/73-19.2%). **Conclusion:** A high prevalence of DT was found in DP, with the majority of cases being related to mental and multiple diseases. Further research is needed to assess the prevalence of DT in this patient group throughout the Federal District.

**Descriptors:** Tooth injuries; disabled persons; dental care.

## INTRODUCTION

Disability is intrinsic to the human condition. Thus, some people will inevitably present some disability, whether temporary or permanent, at some point in their lifetime. In addition, those who attain older age face increasing difficulties as the functionality of their body declines[1,2].

The United Nations (UN) estimates that the incidence of temporary or permanent disability reaches 10% of the population in developing countries. According to the 2010 census conducted by the Brazilian Institute of Geography and Statistics (IBGE), the number of disabled persons (DP) in Brazil is approximately 46 million, which represents 23.92% of the population. However, the current oral health situation of DP is poorly studied, and reliable data remain scarce[3,4].

The dental care that DP require has specific characteristics for each type of patient. Thus, it is important to recognize that different types of disability entail specific intrinsic limitations, since every DP is the sum of their experiences, difficulties, opportunities and intellectual development. Some patients require special management measures and professional adjustments for their dental care, while others may be treated in a conventional way; in any event, their autonomy and family aspects must be respected[1,5]. On the other hand, finding specialized dental care for DP is a healthcare difficulty experienced by many families in the Federal District (DF). To meet this need, the Dental Clinic for Special-Needs Patients (COPE) of the Catholic University of Brasilia (UCB) has been providing dental care to persons from special-needs groups since 2005.

Although motoricity and intelligence limitations are known risk factors for the occurrence of dental trauma (DT), few studies in the literature report the prevalence of DT in disabled individuals, and the vast majority of studies on DT involve patients considered non-disabled. According to Batista†, DT is a clear public health problem whose prevalence in Brazil averages 24.96% in preschoolers, 19.2% in schoolchildren, and 19.3% in adults (non-disabled persons).

A study conducted in Kenya by Ohito et al.[6] reported that mentally retarded and physical disabled children and adolescents had a higher frequency of dental fracture than a non-disabled group. In another study, Nunn et al.[7] reported a DT prevalence of 28.8% in disabled persons. Shyama et al.[8] evaluated 818 disabled persons and reported a DT prevalence of 16.9% among patients with visual, auditory and physical disabilities or developmental disturbances.

Given the scarcity of studies evaluating the prevalence of DT in DP, the general objective of the present study was to evaluate the prevalence of DT in individuals with some type of disability treated by undergraduate students undergoing compulsory training at the Dental Clinic for Special-Needs Patients at the Catholic University of Brasilia, and to test the hypothesis that a high prevalence of DT exists among persons with motor and intellectual disabilities.

† Batista RSC. Estudo sobre o traumatismo dentário: uma revisão crítica da literatura [Trabalho de Conclusão de Curso]. João Pessoa: Universidade Federal da Paraíba; 2010.

## METHODOLOGY

This study was approved by the Research Ethics Committee, School of Health Sciences, University of Brasília (UnB), under opinion No. 461.917. A cross-sectional documentary study was carried out. Secondary data were obtained from patient dental charts. The same duly calibrated researcher carried out the analysis of 86 charts for the period 2014 to 2016. Seventy-three charts, completely filled out and legibly written, were included. Other inclusion and exclusion criteria were: complete chart, Free and Informed Consent Form (FICF) signed by the patient or guardian, and patient previously registered at the UCB clinic for special-needs patients. A total of 13 charts were excluded. Duplicated records were also excluded. The medical and dental diagnoses of the patients were described according to the data found in the charts analyzed.

Data on gender, age, ethnicity, follow-up period, presence of DT and type of disability were recorded. For those patients with DT, the affected tooth and the classification of the trauma were also investigated. DT were classified according to Andreasen, Andreasen[9] into crown fracture, crown-root fracture, root fracture and injury involving the tooth and periodontal supporting tissues. Whenever necessary, diagnosis of DT was confirmed by means of a radiograph of the region.

The variables were analyzed using descriptive statistics. In the descriptive analysis of the data, the proportions (percentages) of the variable categories were reported. The *t*-test was used to check for significant differences between these percentages. The level of significance adopted was 5% ($p < 0.05$). Bonferroni's theorem was used to adjust the level of significance ($p < 0.05$) when the plan involved multiple tests of the same type. The Statistical Package for Social Sciences (SPSS), version 23.0 (IBM Corporation, Armonk, NY, USA), was used to evaluate the data.

## RESULT

Analysis of the 73 charts revealed that 43 (58.9%) of the patients with some type of disability were male and 30 (41.1%), female, with no significant difference regarding gender ($p > 0.05$).

Patients in the sample had a variety of diseases. For statistical purposes, these were grouped into 6 (six) categories according to type of disability: motor, mental, visual, auditory, systemic, and multiple (association of two or more disabilities) (Table 1). Table 1 shows the number of individuals with DT according to disability type. The most prevalent categories were mental (10 cases - 30.3%), multiple (9 cases - 27.3%), and systemic (7 cases - 21.2%).

Most of the patients evaluated were white (31/73-42.5%), or brown (28/73-38.4%), with no significant difference between the proportions of these categories ($p > 0.05$). However, the proportions of the white and brown categories were significantly higher than those for the black and yellow races, accounting for 3/73 (4.1%) and 1/73 (1.4%), respectively.

The majority of patients were over 20 years old (63/73-86.3%), a significantly higher proportion than for the other age categories ($p < 0.008$) (Table 1).

**Table 1.** Overview of the demographic data and clinical characteristics of the study patients

| General characteristics of patients (n = 73) | n | % | p |
|---|---|---|---|
| **Gender** | | | |
| Male | 43 | 58.9 | NS* |
| Female | 30 | 41.1 | |
| **Race** | | | |
| White | 31 | 42.5 a | <0.008** |
| Black | 3 | 4.1 b | |
| Brown | 28 | 38.4 a | |
| Yellow | 1 | 1.4 b | |
| Not informed | 10 | 13.7 | |
| **Age** | | | |
| 2-5 years | 4 | 5.5 a | <0.008** |
| 5-10 years | 4 | 5.5 a | |
| 10-20 years | 2 | 2.7 a | |
| 20+ years | 63 | 86.3 b | |
| **Patient with DT** | | | |
| Yes | 33 | 45.2 | NS* |
| No | 40 | 54.8 | |
| **Teeth with DT** | | | |
| Not informed | 2 | | |
| Deciduous tooth (tooth 82) | 1 | 1.8 | 0.000* |
| Permanent tooth | 56 | 98.2 | |
| Upper arch (n = 34) | | | |
| Central/lateral incisors | 14 | 41.2 | NS** |
| Canines | 4 | 11.8 | |
| Premolars | 12 | 35.3 | |
| Molars | 4 | 11.8 | |
| Lower arch (n = 22) | | | |
| Central/lateral incisors | 6 | 27.3 | NS** |
| Canines | 5 | 22.7 | |
| Premolars | 6 | 27.3 | |
| Molars | 5 | 22.7 | |
| **Type of DT (n = 33)** | | | |
| Crown fracture (%) | 26 | 78.8 a | <0.016*** |
| Injury with dental and periodontal involvement | 2 | 6.1 b | |
| Root fracture | 1 | 3.0 b | |
| Not informed | 4 | 12.1 | |
| **Patient follow-up** | | | |
| A (≤ 1 month) | 12 | 16.4 a | <0.008** |
| B (1-6 months) | 9 | 12.3 a | |
| C (6-12 months) | 22 | 30.1 a, c | |
| D (> 12 months) | 30 | 41.1 b, c | |
| **Category of disease of DT patient** | | | |
| Systemic | 7 | 21.2 a, c | <0.003**** |
| Motor | 3 | 9.1 a, c | |
| Mental | 10 | 30.3 a | |
| Auditory | 1 | 3.0 b, c | |
| Visual | 3 | 9.1 c | |
| Multiple | 9 | 27.3 a | |

*One-sample *t*-test; critical alpha level: $p < 0.05$. NS: not significant ($p > 0.05$); **Bonferroni's theorem was used to adjust the critical alpha level. Different letters among percentages indicate statistically significant differences ($p < 0.008$). NS: not significant ($p > 0.008$); ***Bonferroni's theorem was used to adjust the critical alpha level. Different letters among percentages indicate statistically significant differences ($p < 0.016$); ****Bonferroni's theorem was used to adjust the critical alpha level. Different letters among percentages indicate statistically significant differences ($p < 0.003$).

Among all the patients evaluated (n = 73), the majority (52/73-71.2%) were followed-up for at least 6 months. This proportion was calculated by summing the percentages of the 6-12 months and 12+ months categories, whose percentages were significantly higher ($p < 0.016$) than those for the other follow-up categories (Table 1).

The prevalence of DT in this population was 45.2%. The total number of teeth affected was 57, with a mean of 1.72 teeth per patient. The most affected teeth were the anterior and premolar teeth of the upper arch. The predominant type of fracture was crown (78.8%), observed at a percentage significantly higher than those for the other fracture types ($p < 0.016$). The distribution of the types of dental injuries analyzed is shown in Table 1. The description of the type of fracture was missing in four charts.

Among those who presented DT, the great majority of cases (98.2%) occurred in permanent teeth ($p < 0.001$). Among the permanent teeth, there was no statistically significant difference between the different locations of the DT (upper or lower arch) or between the different tooth types.

## DISCUSSION

The prevalence of DT found in this study was 45.2%, which is in agreement with reports from previous studies indicating a prevalence of trauma in patients with disabilities ranging from 9%, in the visually impaired, to 57%, in patients with cerebral palsy[10,11]. According to the study performed by Locker[12], the prevalence of DT in adult (18–50 years) and non-disabled individuals was 15.5%. Compared with this figure, the present study found a prevalence rate approximately 3 times higher among disabled patients from a similar age group. Both of the cited studies presented bias in failing to perform data collection immediately after the occurrence of the DT and thus depended on the memory and observational collaboration of third parties. A higher rate was also found in the study conducted by Miamoto et al.[13], in which the prevalence of DT was 18% in the cerebral palsy group, and 5% in the control group. The study also showed that individuals with cerebral palsy ($p = 0.031$) were four times more likely to present with DT than individuals in the control group.

The crown type trauma involved enamel and enamel/dentin fractures, as well as complicated enamel/dentin fractures, and was observed in 78.8% of cases of fracture in the present study. This higher prevalence of crown fractures is in agreement with the data found by Costa et al.[14], who analyzed 500 individuals with cerebral palsy. Of these patients, 53 (10.6%) had some type of DT, with the most frequent fractures involving enamel and enamel/dentin, without pulp exposure (84.9%). This finding also confirms the results obtained by Holan et al.[11], who analyzed the cases of 68 individuals and observed that most of the fractures (62%-42/68) involved enamel and dentin. Studies did not differ regarding the type of tooth fracture observed in disabled patients.

Although the difference between upper and lower dental arches in terms of DT involvement was not statistically significant, a higher percentage of central/lateral incisors and premolars of the upper arch were affected by trauma. Queiroz et al.[15] observed that 19.3% of students with disabilities had DT in the incisors group, while

Firoozmand et al.[16] conducted an analysis in the mixed dentition showing that the most affected teeth were the permanent upper central incisors (46.81%), followed by the deciduous upper central incisors (17.02%), and the deciduous upper lateral incisors (12.76%).

Patients considered to be disabled are part of a very heterogeneous group, which includes diverse types of disabilities. In the present study, for statistical purposes, patient disabilities were categorized into auditory, visual, mental, motor, multiple, and systemic types[15].

The most prevalent diseases were mental (30.1%) and multiple (26%), as shown in Table 1. This result is consistent with that found by Queiroz et al.[15], who evaluated 74 students aged 14-35 years. Of these individuals, 64% were mentally disabled and 14% had more than one disability (multiple). Santos et al.[2] analyzed 361 charts of patients with DT and, unlike the present study, found a higher prevalence of individuals with motor disability (25.8%).

The adult profile of the sample (patients aged ≥ 10 years) explains the high percentage of traumatized permanent teeth (98.2%), with only one deciduous tooth (tooth 82) among those teeth with DT. Other studies in school-age disabled patients are necessary, since this age group has a higher prevalence of DT[14,17].

An analysis of the studies evaluated[2,15,18,19] revealed that some authors found a higher prevalence of DT in males, a finding corroborated by the results of the present study, in which men were numerically more affected by DT than women. Holan et al.[11] and Costa et al.[14], however, found different results. A higher frequency of traumatic injuries occurred in school-age individuals and/or were associated with falls, car accidents and fights, among other causes[20]. DT in DP may result from mental impairment, poor motor control, involuntary physical movements, pathological oral reflexes, spasticity in masticatory muscles or slow response in avoiding obstacles. These conditions are equally common for both genders among DP[18].

One of the difficulties of the researcher was the collection of data from the charts. Failure to fill out relevant items, incomplete information, and illegible handwriting led to the exclusion of some charts that, if properly completed, could have strengthened the evidence produced by the study. A lack of specific questions about the DT was also identified, which is not in keeping with the high prevalence of DT described in the literature and with the fact that DT is considered a public health problem[17]. A low level of DT citations was identified[2,15,20] in epidemiological studies involving DP, even though studies show a high prevalence of these injuries in this patient group[11,13,18]. This suggests an underdiagnosis of DT, thus indicating that the available data is still inadequate for reliable determination of the prevalence of DT. There is low clinical evidence on what could be characterized as success in the care of DP with DT, and the sequelae resulting from this injury tend to go unnoticed, thus precluding the establishment of an effective basic protocol.

There is a shortage of professionals specialized in the emergency care of non-disabled patients with DT. Therefore, when DP and their particularities are considered, the availability of this type of professional is significantly lower[15,17,18,21]. Hence, investing in preventive-educational measures to prevent the occurrence of DT is the most effective way to care for this group of patients. This approach would reduce the need for emergency care in those cases where, even after taking all the precautions, DT proves unavoidable[22].

In the event of situations of DT, rapid decision-making and treatment choice leads to a higher rate of clinical success[17]. However, when caring for patients with some type of disability—often in their first contact with dental treatment—one or more conditioning appointments are necessary to obtain the patient's collaboration, and this additional clinical time is not always available during the emergency care of a DP with DT[15,23]. Therefore, in some cases, containment techniques, medication, or even general anesthesia may be used in a hospital environment[2,21,24].

A careful investigation of how, when and where trauma occurred is essential, and patient history should also be considered to identify problems that may disrupt care[17].

In general, the presence of the caregiver during the care session facilitates obtaining this information. In addition, being acquainted with the disability, its limitations and characteristics; holding scientific knowledge about the guidelines of DT treatment, determining the best treatment option, and welcoming the patient and their relatives, are all factors affecting the final prognosis[15,20,22,23].

An important step is to inform the DP and their family that DT is a possible condition, enabling them to recognize the problem and take appropriate measures when faced with the trauma. The impact of DT on the patient's general and oral health should be made clear, potentially affecting speech and nutrition. A tooth fracture can leave sharp edges that can lead to traumatic injuries; dentin may be exposed, increasing susceptibility to caries and, in more severe cases, the tooth may be lost[15,20,22].

Mass awareness campaigns should be carried out, showing that regular visits to the dentist contribute significantly to oral health and early identification of abnormalities[20]. During anamnesis, questioning the patient and/or their guardian about the dental trauma and its history is essential. It is also imperative to have reference centers and/or trained professionals available, which should be given the basic infrastructure required for providing care[17].

The best possible treatment should be established, avoiding mutilating actions at all costs, namely tooth extraction, which is still a highly prevalent treatment in the case of DP[25]. Post-treatment follow-up should be judicious in order to identify the therapeutically correct and effective approach in the long term.

DT requires emergency care, and patients who have undergone previous conditioning, who attended the dentist regularly, and who have experienced positive welcoming techniques exhibit a much higher level of collaboration[21,24]. Therefore, investing in basic oral health (prevention-education) contributes to greater acceptance of an emergency treatment and reduces the need for more complex care, such as care under general anesthesia.

## CONCLUSION

A high prevalence of DT was found in DP, with the majority of cases being related to mental and multiple disabilities. Further research is needed to assess the prevalence of DT in this patient group throughout the Federal District.

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## CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

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