

ASSESSMENT OF KNOWLEDGE ABOUT DENTAL TRAUMA IN LICENTIATE STUDENTS

AVALIAÇÃO DO CONHECIMENTO SOBRE TRAUMATISMOS DENTÁRIOS ENTRE ALUNOS DE CURSOS DE LICENCIATURA

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ABSTRACT

Dental trauma consists of injuries to the soft and hard tissues of the oral cavity, occurring suddenly and frequently in children and adolescents, especially in the school environment. Therefore, this study aimed to evaluate the knowledge of licentiate students in teacher education programs at the Universidade Federal de Santa Maria, main campus, regarding the management of dental trauma before and after an instructional lecture and the provision of educational materials. To support this training, a leaflet and a booklet were developed. Questionnaires were applied to 164 students at two times: T1 (before the lecture and distribution of the educational materials) and T2 (after the intervention). At baseline, 95.8% of participants reported not knowing how to act in the event of dental trauma and 97% stated that they had never received any first aid training related to dental emergencies, although 30.9% had witnessed dental trauma in schoolchildren. After the intervention (T2), most participants acknowledged the relevance of the topic (97.56%) and reported feeling prepared to act in such situations (82.93%). Licentiate education students have insufficient knowledge regarding the management of dental trauma. The educational intervention effectively increased awareness of the importance of the topic and confidence to act, reinforcing the need for the systematic inclusion of this content in the curriculum of future teachers.

Keywords: Dental trauma; Health education; Oral health; Preventive dentistry; Teachers.

RESUMO

O traumatismo dentário consiste em lesões nos tecidos moles e duros da cavidade bucal, ocorrendo de forma súbita e frequentemente em crianças e adolescentes, em especial no ambiente escolar. Diante disso, este estudo teve como objetivo avaliar o conhecimento dos acadêmicos dos cursos de licenciatura da Universidade Federal de Santa Maria, localizada no campus sede, sobre o manejo de situações de traumatismo dentário antes e após uma palestra instrutiva e a disponibilização do material educativo elaborado. A fim de contribuir com essa capacitação, foram elaborados um *folder* e uma cartilha, que estão expostos neste artigo. Para isso, foram aplicados questionários a 164 estudantes, em dois momentos distintos: T1, antes da palestra e da distribuição do material educativo; e T2, após essa ação de educação em saúde. No primeiro momento, observou-se que 95,8% dos participantes afirmaram não saber como agir diante de um trauma odontológico, e 97% relataram nunca ter tido acesso a qualquer curso de primeiros socorros voltado à área odontológica, apesar de 30,9% já terem presenciado situações de traumatismo em escolares. Após a capacitação (T2), a grande maioria dos participantes reconheceu a relevância do tema (97,6%) e declarou sentir-se preparada para atuar diante dessas situações (82,9%). Conclui-se que os acadêmicos de licenciatura apresentam conhecimento insuficiente sobre o manejo do traumatismo dentário, e que a intervenção educativa se mostrou eficaz ao ampliar o reconhecimento da importância do tema e a confiança para atuar, reforçando a necessidade de inserção sistemática desse conteúdo na formação de futuros docentes.

Palavras-chave: Traumatismos dentários; Educação em saúde; Saúde bucal; Odontologia preventiva; Professores.

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INTRODUCTION

Dental trauma (DT) is characterized by injuries caused by impact to hard and soft tissues in or around the oral cavity and often occurs suddenly and unexpectedly. It can cause great functional and aesthetic concern (1). Estimates suggest that about one third of the world's population suffers from some type of DT throughout their lives. They can present a wide variety of injuries: from simple to more complex fractures involving the supporting bone, contusions, abrasions, and even soft tissue lacerations (1-3).

Traumatic dental injuries show great prevalence in school-age children. They can generate pain, impair masticatory function and speech, and significantly impact aesthetics, which directly affect children's self-esteem and psychological health. The most common causes of this type of trauma involve accidental falls, physical fights, accidents during sports and recreational activities, car accidents, trauma due to objects, and maltreatment (2).

As per Guedes-Pinto *et al.* (3), the multiple DT classifications consider the tissues affected by the lesion and its complexity. These factors are decisive in choosing the most appropriate therapeutic approach. Injuries to the dental hard tissues (such as the enamel and dentin) can manifest themselves as cracks or fractures (which can occur with or without pulp exposure). Trauma can also injure dental support tissues, such as the periodontal ligament and the alveolar bone (which fixate and support the teeth). Of the main injuries to these tissues, the following stand out: (I) subluxation, when some fibers of the periodontal ligament rupture (resulting in a small bleeding that emerges from within the gingival groove), (II) intrusive luxation (when the tooth enters into its socket, compressing or fracturing its supporting bone), (III) extrusive luxation (when the tooth partially moves out of its socket), and (IV) dental avulsion (when the tooth is completely knocked out of its socket) (3).

Children spend about one third of their time at school, an environment prone to accidents and trauma to the oral cavity because of the large number of recreational activities (4,5).

In this context, the absence of specific knowledge about the correct protocols to evaluate and treat DT often results in failures in initial care, especially if performed by individuals without a degree in dentistry. Moreover, teachers, caregivers, or other laypersons present at the time of the accident often provide first emergency care (6). However, the prognosis of many dental injuries is directly related to the prompt and correct administration of first aid, including the provision of accurate and appropriate guidance.

Thus, it is essential that those who live directly with children and adolescents, such as parents, educators, and caregivers, have basic and up-to-date knowledge on how to act in these situations (7).

Due to the importance of immediate care, professionals who work daily with children exposed to risk situations must receive training to recognize and properly manage DT (8). This highlights the relevance of oral health education targeting those directly responsible for childcare. However, this theme remains scarcely addressed in teacher training, and, in general, outside the syllabus of first aid courses or didactic materials for educators (9,10).

Thus, this study aimed to evaluate the knowledge of licentiate students at the main campus of Universidade Federal de Santa Maria (UFSM) about the management of dental trauma before and after an educational intervention consisting of an instructive lecture and distribution of educational material that had been prepared for educators and future professionals.

METHODS

This exploratory quantitative, observational, and analytical study was approved by the UFSM Ethics Committee for Research with Human Beings under CAAE 73191717.1.0000.5346.

Its sample included students enrolled in on-campus licentiate courses at UFSM, main campus: biological sciences, dance, special education (afternoon class), special education (evening class), physical education, philosophy, physics (afternoon class), physics (evening class), geography, history, languages, mathematics, music, pedagogy, chemistry, sociology, and drama. Only students in their last semester who agreed to participate by signing informed consent forms were included in this study. Those enrolled in other semesters or who refused to participate in this research were excluded.

The worst DT outcome (dental avulsion) was considered to calculate the sample size using data from the study by Costa *et al.* (2), in which 43.4% of participants stated not knowing how to proceed in the face of such events. Considering an 80% power, a 5% significance level, and a 5% estimation error, the minimum sample size obtained was 377 students. Moreover, considering the heterogenous licentiate courses and health skills, the final sample was stratified in direct proportion to the size of the classes in the last semester or to the size of the population per academic center, with an increase of 20% for loss control, resulting in 453 students. However, due to limitations in

participant recruitment, only 164 eligible licentiate students were included in this research (a lower number than initially planned).

The students invited to participate in this study had been informed about the objectives of this research and, upon agreement, signed an informed consent form. At first (time 1 – T1), a questionnaire was applied to collect their sociodemographic information (such as age, gender, and education). It also contained questions related to their previous knowledge and experience in managing DT. Then, the participants attended a lecture on health education that focused on DT and received an illustrative folder (Figure 1). Then, another questionnaire was applied to assess their perceptions and impressions about the content of the lecture (time 2 – T2).

The researchers underwent a two-hour prior training course to adapt the words they were to use in data collection and lectures. The expository material dealt with “DT in the preschool and school age group;” it covered the definition of DT, its prevalence, main causes, and predisposing factors, types (concussion, subluxation, luxation, fracture, and avulsion), the relationship between age and dentition, and practices to be taken according to the severity of each case and type of dentition (whether deciduous or permanent). To complement the intervention, the folder was prepared in a clear, objective, and visually organized way, presenting essential information on the subject, immediate practices, and referral guidelines with accessible language and visual resources that facilitated understanding.

Adapted from a previous study (9), two questionnaires were used due to the lack of a previously validated instrument specific for this purpose. Questionnaire A was applied before the educational intervention. It addressed sociodemographic characteristics, knowledge, attitudes, and experiences related to DT, whereas evaluative questionnaire B, prepared by the authors, was applied after the lecture.

Data were analyzed by descriptive and inferential statistics. Qualitative variables are shown as absolute and relative frequencies and quantitative variables, as mean and standard deviations or medians, according to data distribution. Tabulation and statistical analysis were performed on SPSS®, 17.0.

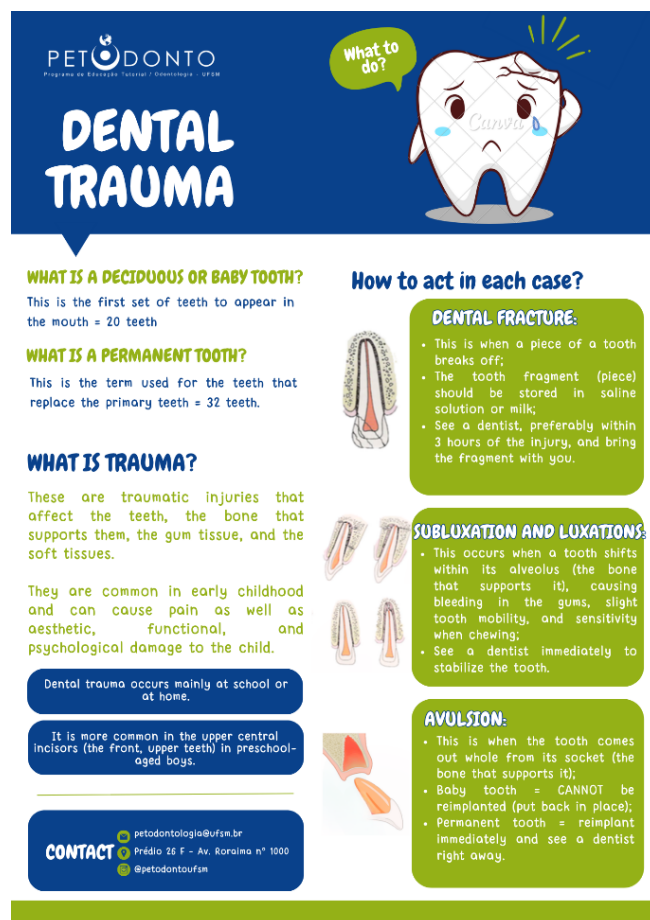


Figure 1 – Leaflet on dental trauma.

RESULTS

Students from 13 licentiate courses at UFSM, main campus — special education (evening class), special education (afternoon class), pedagogy (evening class), history, dance, biology, chemistry, mathematics, physics (evening class), physics (afternoon class), geography, languages, and physical education — joined this research, totaling 164 undergraduate students, of which 68.9% (n=113) were women. Participants' age ranged from 18 to 64 years, with a mean of 25.6 years (± 8.08 years).

At T1, 95.8% of students stated having no knowledge about how to act in DT, and 97.0% of the interviewees reported having had no access to any dental first aid course, specifically related to trauma. After training (T2), most participants acknowledged the relevance of the theme (97.6%) and stated feeling prepared to act in these situations (82.9%). Table 1 further details participants' answers to questions in T1, whereas Table 2 refers to T2.

Table 1 – Knowledge of licentiate students at Universidade Federal de Santa Maria – Santa Maria, RS, about DT at T1.

Questions applied at T1	Yes n (%)	No n (%)	Did not know how to answer n (%)
1 – Do you have knowledge about how to manage dental trauma?	7 (4.2)	157 (95.8)	0 (0)
2 – Have you had any training on first aid in dental trauma in higher education?	5 (3.0)	159 (97.0)	0 (0)
3 – Do you feel prepared to help a child with dental trauma?	13 (7.9)	151 (92.1)	0 (0)
4 – Have you ever witnessed a situation of dental trauma in the preschool and school phase?	51 (30.9)	113 (69.1)	0 (0)

Table 2 – Knowledge of licentiate students at Universidade Federal de Santa Maria – Santa Maria, RS, about DT at T2.

Questions applied at T2	Yes n (%)	No n (%)	Did not know how to answer n (%)
1 – Do you believe that after the lecture you acquired knowledge about how to manage dental trauma?	159 (97.0)	0 (0.0)	5 (3.0)
2 – Do you believe that after the lecture you can help students with dental trauma?	136 (82.9)	4 (2.4)	24 (14.6)
3 – After the lecture, do you consider that there is a need for first aid training in dental trauma in your course?	135 (82.3)	16 (9.8)	13 (7.9)
4 – Do you consider that the lecture benefitted your academic/professional career?	153 (93.3)	1 (0.6)	10 (6.1)
9 – Do you consider it important that educators have knowledge and training to act in the face of dental trauma in preschool- and school-age children?	160 (97.6)	1 (0.6)	3 (1.8)

DISCUSSION

Still in its developmental stage, the child's body lacks full awareness of its movements, making children more prone to injuries, including unintentional ones (11). During their first years of life, children often spend much of their time in care or daycare centers and schools, environments that, although fundamental for their development, increase the risks of accidents, including DT. In this scenario, attentive and trained caregivers are essential to provide appropriate initial care in cases of traumatic dental injuries. DT is a highly prevalent condition in school-age children, affecting about 25% of this age group (12). Injuries to dental and supporting tissues can cause irreparable damage, especially when those involved, including the ones responsible for the child, fail to immediately seek specialized care due to lack of knowledge (13,14).

The first care provided by professionals at the scene of the accident, such as school staff, plays a crucial role in the prognosis of the affected teeth since immediate and appropriate treatment can be decisive in minimizing the consequences of trauma and increasing the chances of functional and aesthetic recovery. However, studies in several countries show that teachers, sports coaches, and other school employees often lack the necessary knowledge to effectively deal with these cases (15).

According to the data in this study, at T1, 95.8% of the interviewees stated having no knowledge

about how to help children experiencing DT, although 30.9% of them had witnessed some case of DT in preschool- or school-age children. These results are in line with previous research, such as one in a private school network in the city of Patos, which interviewed 138 teachers and found a generalized lack of knowledge about immediate management procedures for TD incidents. Moreover, 30.9% of these professionals reported having witnessed DT in children of the same age group (16). Similarly, a study in Saudi Arabia showed that 65.3% of school staff had witnessed some DT case, but only a small portion had adequate training to act in these cases (15).

The lack of training in teachers can be mainly attributed to the absence of this theme in their academic training and the lack of specific content in the curricular structure of their licentiate courses. Studies indicate that most teachers receive no information about first aid (including in DT management) during their undergraduate studies (15,8). Fittler *et al.* (17), studying teachers in Hungary, reported that, although more than half of the interviewees had witnessed DT in schools, few were properly prepared to intervene correctly. This scenario highlights the urgent need for specific and continuous training for these professionals.

Inadequate or delayed care can severely compromise the prognosis of affected teeth. The extra-alveolar time and the conditions of tooth storage constitute determining factors for prognosis

in tooth avulsion. More recent guidelines from the International Association of Dental Traumatology recommend that replantation should preferably be performed immediately or within the first 15 to 20 minutes after trauma, and periods longer than 60 minutes outside the socket are associated with a poor prognosis, with a higher risk of root resorption and tooth loss (18). The lack of knowledge about this aspect is worrisome as many educators may fail to recognize the urgency of the situation, delaying the search for specialized dental care.

The effects of DT go beyond immediate oral health, and can cause fear and anxiety related to the activity that caused the accident, such as engaging in games or playing sports. Children may also develop apprehension about future dental treatment, fearing the pain or discomfort associated with its procedures. The scientific literature also points out that trauma affects the anterior teeth the most, which can result in significant aesthetic damage and negatively impact children's quality of life (14,19). A meta-analysis with 10 studies reinforces that DT has a relevant negative impact on children's self-esteem and social interactions, further highlighting the importance of implementing effective educational actions to prevent and manage these accidents (13).

In line with these data, our study showed that 97.0% of interviewees indicated having never received formal training to manage DT (although they recognized the importance of this training). This strongly suggests that teachers' academic training should incorporate first aid education (including specific procedures for DT). Moreover, continuous training should be encouraged to ensure that educators are always up to date and prepared to act safely and efficiently in these cases (20).

Thus, it is essential to invest in the education and training of education professionals to manage DT. Programa Saúde na Escola (the Brazilian School Health Program), established by the Brazilian Federal Government in 2007, represents an opportunity to train teachers via a partnership between health and education professionals (21,2).

Another relevant alternative refers to the elaboration and dissemination of interactive educational materials aimed at the school community. Initiatives such as the project "Machuquei meu dente! E agora?" [Free translation: I hurt my tooth. Now what?] by the Ribeirão Preto School of Dentistry at Universidade de São Paulo show that the use of games, videos, and other educational tools can be highly effective in transmitting information about dental first aid. Moreover, training programs targeting physical education teachers (who are more involved

in high-risk activities) can significantly contribute to faster and more effective responses to DT (8).

Thus, the relevant points of this study refer to the participation of licentiate students from several areas and the promotion of adequate feedback to them, offering an informative lecture on how to act in cases of DT. After receiving such guidance, most participants reported feeling prepared to act in the face of DT in preschool and school children, feeling benefited by the knowledge they acquired. Moreover, the main beneficiaries will be the children with whom these future professionals will work since they will have the opportunity to receive adequate referral for treatment, if necessary, in the face of DT.

Therefore, it is essential that parents, educators, and health professionals are aware of the impacts of DT and that they work together to provide the necessary support, minimizing the consequences of these injuries on children's lives. From a practical point of view, the findings of this study reinforce the need for systematic educational actions aimed at training teachers and other professionals in the school community due to the relevance of DT as a frequent health problem in childhood and adolescence and its impact on oral health (22). The literature indicates that these events are associated with various etiological and risk factors, with the school environment being one of the main occurrence scenarios, which requires adequate training so professionals can recognize urgency and adopt appropriate immediate measures (18). Worldwide studies have shown a high prevalence and incidence of DT, characterizing it as an important public health problem (23). The guidelines of the International Association of Dental Traumatology highlight that the appropriate initial management directly influences the prognosis of traumatized teeth (24).

Thus, the inclusion of this content in intersectoral public policies (such as the Brazilian School Health Program) and in primary health care actions may reduce the time of referral to dental care (25). Systematic reviews have shown the high exposure of children and adolescents to risk factors for DT, reinforcing the importance of preventive and educational strategies in this population (26). Moreover, improperly managed traumas can result in clinical and radiographic sequelae, especially in deciduous teeth (27). Brazilian studies show gaps in teachers' knowledge regarding the management of dental avulsion, indicating the need for their continuous training (28). Thus, simple educational strategies, such as workshops, lectures, and informative materials, can feasibly and effectively expand educators' knowledge of dental trauma management (29).

Interpreting the results of this study requires considering its limitations. First, this research restricted its sample to students in the last semester of their in-person licentiate courses at UFSM, thus recruiting less participants than initially planned, which may have reduced the statistical power and limited the representativeness of the findings in this research. Moreover, it collected self-reported data, which may have introduced biases related to participants' individual perception of their knowledge and skills. Finally, this study only evaluated the short-term effect of its educational lecture, rendering impossible inferences on the long-term persistence of participants' increase in knowledge and confidence. Future studies could involve larger and more diverse samples, include follow-up assessments to assess learning persistence, and explore other educational strategies to maximize knowledge retention and behavior change.

CONCLUSIONS

Most undergraduate licentiate students at UFSM had insufficient knowledge about dental trauma and first aid in the school environment, revealing a significant gap in the training of these future professionals. On the other hand, the intervention increased participants' acknowledgement of the importance of the theme (97.6%) and confidence to respond to DT situations (82.9%). These findings reinforce the need to include content related to DT management and first aid in academic training and to promote continuous educational actions for professionals working in schools. Moreover, the integration between the health and education sectors, especially via primary health care and the Brazilian School Health Program, is essential to improve initial care, reduce the time of referral to dental care, and improve the prognosis of traumatized teeth in children. Thus, this study recommends the systematic insertion of its theme in the curriculum of licentiate courses to ensure the adequate training of future teachers so they can address these situations in schools.

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