ORIGINAL ARTICLE

ANALYSIS OF THE PREVALENCE AND KNOWLEDGE ABOUT PREVENTIVE MEASURES AND FIRST AID IN CASES OF DENTAL TRAUMA AMONG ATHLETES FROM SANTA MARIA – RS: A CROSS-SECTIONAL STUDY

ANÁLISE DA PREVALÊNCIA E DO CONHECIMENTO SOBRE MEDIDAS PREVENTIVAS E DE PRIMEIROS SOCORROS EM CASOS DE TRAUMATISMOS DENTÁRIOS ENTRE ATLETAS DE SANTA MARIA – RS: ESTUDO TRANSVERSAL

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ABSTRACT

Sports practice promotes well-being and quality of life, providing physical and psychological benefits. However, especially in contact sports, it is associated with the risk of orofacial trauma. This study investigated the prevalence of dental trauma in athletes and assessed their knowledge of preventive measures and first aid in such cases. The research was conducted through the administration of questionnaires to 58 athletes from different sports modalities. Results revealed that 47 athletes (81.03%) had already suffered some type of orofacial or dental trauma. Only 12 participants (20.68%) reported having knowledge about appropriate emergency management, and seven (12.06%) stated that they regularly used a mouthguard. The findings show a high prevalence of trauma and limited knowledge among athletes regarding prevention and emergency management, in addition to low adherence to mouthguard use—even among contact sports participants. In conclusion, educational actions and institutional strategies are needed to promote the use of mouthguards and to train athletes, coaches, and others in the prevention and proper management of dental trauma, thereby strengthening the integration between oral health and sports performance.

Keywords: Mouthguard; Athletes; Dental trauma; Sports; Dentistry.

RESUMO

A prática esportiva promove bem-estar e qualidade de vida, proporcionando benefícios físicos e psicológicos. No entanto, especialmente em esportes de contato, está associada ao risco de traumatismos orofaciais. Este estudo teve como objetivo investigar a prevalência de traumatismos dentários em esportistas e avaliar o conhecimento dos atletas sobre medidas preventivas e de primeiros socorros diante dessas ocorrências. A pesquisa foi realizada por meio da aplicação de questionários a 58 atletas de diferentes modalidades esportivas. Os resultados revelaram que 47 atletas (81,03%) já sofreram algum tipo de traumatismo orofacial ou dentário. Apenas 12 participantes (20,68%) afirmaram ter conhecimento sobre o manejo emergencial adequado, e sete (12,06%) relataram utilizar protetor bucal regularmente. Os achados demonstram uma alta prevalência de traumatismos e um conhecimento limitado por parte dos atletas sobre prevenção e condutas de emergência, além de baixa adesão ao uso de protetores bucais – mesmo entre praticantes de esportes de contato. Conclui-se que são necessárias ações educativas e estratégias institucionais que promovam o uso de protetores bucais e capacitem atletas, treinadores e demais envolvidos quanto à prevenção e ao manejo adequado dos traumatismos dentários, fortalecendo a integração entre saúde bucal e desempenho esportivo.

Palavras-chave: Protetor bucal; Atletas; Trauma dental; Esportes; Odontologia.

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INTRODUCTION

Dental trauma, which involves the hard tissues, supporting structures, and soft tissues of the oral cavity, represents between 14% and 39% of the injuries sustained in sports activities (1). Most common traumatic injuries in dentistry vary depending on the dentition, patient age, and circumstances of trauma. In permanent teeth, fractures involving only enamel or enamel and dentin without pulp exposure are the most prevalent, especially in maxillary central incisors (2,3). In deciduous dentition, displacement injuries such as luxations, subluxations, and intrusions occur more frequently due to the lower bone density and greater flexibility of the alveolar bone (3,4). Although less common, tooth avulsion represents one of the most critical injuries and is more frequent in children between 7 and 9 years of age (5). Injuries such as root fractures and crown-root fractures occur less frequently, but require more complex clinical management and have a guarded prognosis (6). The maxillary central incisor is the most frequently affected tooth in practically all types of trauma (2,3).

Dental injuries are frequent in sports activities and can cause damage that directly affects athletes' physical performance (7). They are common in various sports, including boxing, judo, karate, jiu-jitsu, wrestling, sumo, basketball, volleyball, handball, hockey and rugby, due to physical contact, falls, collisions and use of sports equipment (8-10), being more prevalent in men than in women (11).

These injuries can be prevented with the proper use of mouthguards (MGs) (12). MGs are essential devices for protecting teeth and soft tissues of the mouth during sports, especially contact sports. Lack of prevention measures, however, may lead to temporary withdrawal of athletes for treatment, causing harm to both athletes and the club they represent (10). Another relevant aspect is the impact of dental trauma on the daily lives of individuals. Injuries to the central incisors are common in sports activities and can significantly affect the social life of adolescents (13) and worsen their oral health-related quality of life (14).

According to the American Academy of Sports Dentistry, MGs can reduce the risk of dental trauma by up to 80%, making them essential in contact sports practice (15). Some sports modalities with a higher prevalence of dental trauma show greater adherence of athletes to MG use, and their use is mandatory in several combat sports (16). However, according to Ferrari and Medeiros . (2002) (17), many athletes still do not adopt this measure, despite reporting that they understand its importance.

Thus, this study evaluated the prevalence of dental trauma in athletes from different sports who attended the Associated Laboratories Group of the Federal University of Santa Maria (GLASS/UFSM) located at the Center for Physical Education and Sports (RS, Brazil), between 2023 and 2024, as well as their knowledge about preventive and first aid measures in case of dental trauma.

MATERIAL AND METHODS

This is an exploratory cross-sectional study written following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. It used a convenience sample composed of athletes from different modalities, both contact sports (e.g., futsal and American football) and non-direct contact sports (e.g., archery, shot put, and padel) who attended GLASS/UFSM between 2023 and 2024. This study was approved by the Research Ethics Committee of the Federal University of Santa Maria (CAAE 61215622.0.0000.5346). Athletes from individual or team sports who had been practicing for at least six months, with a minimum frequency of once a week, and who sought GLASS for physical evaluation to improve their performance were included.

All athletes were properly informed of the study's objectives and signed the informed consent form (ICF). Subsequently, they answered a questionnaire with questions that investigated the prevalence of orofacial and dental trauma in their sports life, MG use and knowledge of first aid in case of trauma. Based on previous studies by Martins *et al.* (18) and Perunski *et al.* (19), we adapted the questionnaire to sports in general, removing some questions and adding others of interest to this research. Data underwent descriptive analysis (frequency calculation) on Stata 14.0.

After the interview, the athletes received an educational folder (Figure 1) produced by the Tutorial Education Program (PET) of Dentistry at UFSM to benefit them with knowledge after their kind collaboration by answering the survey. This educational material sought to inform athletes about preventive measures and first aid in case of trauma.

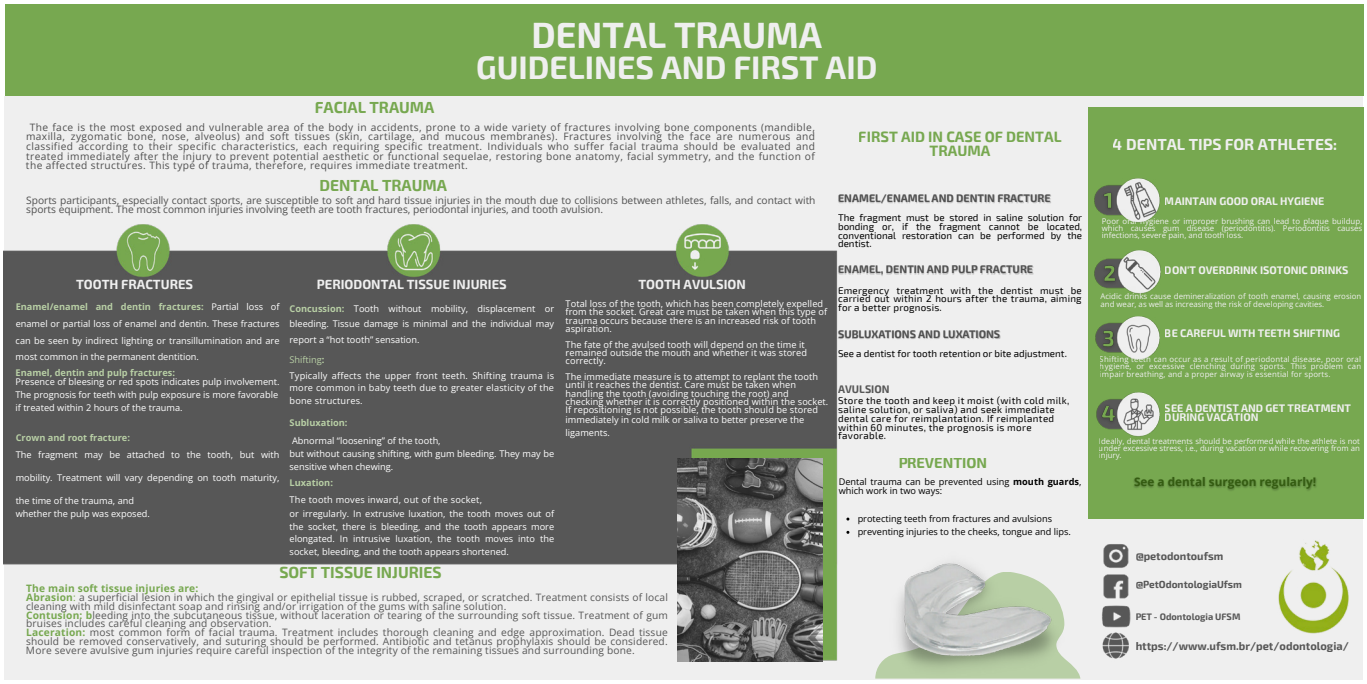

Figure 1 - Guidance and first aid folder for dental injuries in sports that was made available to research participants.

RESULTS

Most participating athletes were male (85%), with ages ranging from 18 to 48 years. They practiced football, padel, basketball, American football, futsal, archery, canoeing, athletics, handball and volleyball. Data were collected from a total of 58 athletes, who could practice more than one sport and therefore answered the questionnaire with more than one option.

Outcome analysis showed that over half of the sample had already suffered orofacial trauma, and approximately one quarter had already experienced dental trauma. Nonetheless, only 20% reported knowing about preventive measures and first aid for dental trauma, and around 12% use MG during sports practice. Table 1 details the results.

Table 1 - Prevalence of trauma, use of mouthguards and preventive knowledge in sports (result expressed in absolute numbers and percentages).

Sport	Number of athletes	Suffered orofacial trauma	Suffered dental trauma	Mouthguard use	Had prior knowledge
Total athletes	58	32 (55.17%)	15 (25.86%)	7 (12.06%)	12 (20.68%)
Football	17	4 (23.53%)	3 (17.64%)	0 (0.00%)	2 (11.76%)
American football	7	2 (28.57%)	0 (0.00%)	7 (100.00%)	3 (42.86%)
Futsal	9	5 (55.56%)	0 (0.00%)	0 (0.00%)	1 (11.11%)
Volleyball	10	3 (30.00%)	4 (40.00%)	0 (0.00%)	1 (10.00%)
Padel	10	2 (20.00%)	4 (40.00%)	0 (0.00%)	0 (0.00%)
Basketball	21	10 (47.62%)	1 (4.76%)	0 (0.00%)	4 (19.05%)
Athletics	13	4 (30.77%)	3 (23.07%)	0 (0.00%)	1 (7.69%)
Other	5	2 (40.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)

Others = footvolley, archery, canoeing, flag football, handball, shot put, javelin and discus throw.

DISCUSSION

Results revealed a high prevalence of orofacial and dental trauma among the athletes studied, especially in contact modalities like futsal (55.56%) and basketball (47.62%). According to Levin *et al*. (2003) (20), contact sports presented a higher risk of orofacial injuries due to the frequency of collisions between players.

However, no American football athlete reported dental trauma, a fact that is related to the universal use of MGs among its players. This finding reinforced that MG use is a more determining factor for preventing dental trauma than the type of sport itself. Knapik *et al*. (2007) (21) noted that regular MG use significantly reduced the incidence of orofacial injuries. When analyzing the XV Pan American Games, Andrade *et al*. (2010) (22) observed that sports without mandatory MG use had a higher occurrence of dental trauma, which reinforced the importance of educational and normative strategies for its use.

In our sample, except for American football athletes, no other players used MGs, even in high-risk sports like football, futsal and basketball. This finding revealed a scenario of misinformation and negligence regarding the adoption of preventive measures. Lack of proper guidance could compromise the oral integrity of athletes and result in permanent damage.

Insufficient knowledge by the athletes regarding dental trauma management was also evident. Most participants reported not knowing how to act in emergencies, especially the padel athletes among whom none showed prior knowledge. In American football, where everyone uses MGs, many athletes reported lack of knowledge, which indicated that adherence was due more to imposition than to preventive awareness. These findings suggested gaps in both athletes' training and the support provided by sports organizations, which have the power to establish norms and guide preventive conduct.

Educational campaigns and institutional actions are evidently necessary. Such strategies could help improve knowledge, promote MG use, and prepare those involved on the appropriate conduct in case of trauma. Health education remained a crucial tool in this context. According to Semencio *et al*. (2017) (23), Santinoni *et al*. (2024) (24) and Bergmann *et al*. (2017) (25), athletes' knowledge of dental trauma was still limited but could be significantly expanded with appropriate educational actions. These authors point out that correct guidance could increase the chances of saving avulsed teeth, as long as time and care with storage were respected.

In this regard, Andreasen *et al*. (2003) (26) highlight that dental replantation performed in up to 60 minutes offered a good prognosis, whereas delayed or inadequate tooth storage drastically reduced the chances of success, which could lead to permanent loss. Educational campaigns could therefore raise awareness and improve emergency response during training and competitions.

Another relevant point concerns the direct influence of health professionals in encouraging preventive measures. Eminoğlu *et al*. (27) showed that, although dentists and coaches played a fundamental role in encouraging MG use, many athletes still did not receive adequate guidance. This gap compromised both injury prevention and response.

Sports dentistry played an essential role in preventing, diagnosing, and treating orofacial injuries, especially among children and adolescents. Ramagoni *et al*. (2014) (28) emphasized that this action requires technical and interdisciplinary knowledge, involving coaches, parents, and other health professionals. Additionally, Padilla and Balikov (1993) (29) highlighted that dentists should participate in activities such as pre-season evaluations, preparation of individualized MGs, and emergency care. According to Taimela *et al*. (1990) (30), dental care should consider not only physical injuries but also aesthetic and emotional impacts for athletes.

Karande *et al*. (2012) (31) showed that interventions conducted by dentists could significantly improve emergency response, as seen in actions with school teachers. However, sports dentistry is still not widespread, requiring expansion of its recognition among athletes and health professionals. Lima *et al*. (2019) (32) reinforced the importance of disseminating the specialty, the use of personalized MGs, and the dentist's role in sports teams, contributing directly to athletes' health and performance.

Praes *et al*. (2023) (33) emphasize that continuing education was essential to prepare parents, students, and teachers for preventing and managing dental trauma. Having a dentist in competitions also improved clinical outcomes, optimizing care in emergency situations. Common injuries in impact sports such as dental fractures, soft tissue cuts, and temporomandibular disorders, could be avoided with MG use. However, Ary Neto *et al*. (2024) (34) pointed out that factors like aesthetics, cost, and misinformation make using these devices difficult, reinforcing the importance of professional guidance and the making of personalized models.

Knowledge about emergency management was still limited in many sports contexts, as observed by Tewari *et al*. (2020) (35). Ferrari *et al.* (2024) (17) added

that the dentist needed to know the athlete's profile and their specific demands, acting in an integrated manner to enhance performance and preserve the oral health of both amateur and professional athletes.

This study has as strengths the relevance of the theme and its educational component, as the participating athletes received informative material. As a limitation, the use of convenience sampling stood out, which could restrict the generalization of the results.

Future investigations should use larger and more representative samples and analyze risk factors associated with orofacial trauma, such as time of sports practice, type of training, use of protective equipment, and institutional support offered by sports entities.

CONCLUSION

In conclusion, the sample studied showed a high prevalence of orofacial trauma and a significant number of dental traumas, both associated with low adherence to MG use during sports practice and insufficient knowledge of athletes about dental trauma and first aid measures.

The authors declare no conflict of interest.

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