

Pain and associated factors in patients attending an emergency dental service in southern Brazil

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ABSTRACT

This cross-sectional study aimed to evaluate the pain outcome and associated factors in patients attending an emergency dental service in southern Brazil. One hundred and thirty-seven (137) patient records from an extension project for emergency dental care training at the Universidade Federal de Santa Maria (Santa Maria, RS, Brazil), relative to the period from April 2017 to December 2018, were evaluated. The data in the records, self-reported by the patients, were collected, and variables related to socioeconomic, medical and dental characteristics were subjected to descriptive statistical analysis and multivariate Poisson regression. The prevalence of pain in these patients was 65.2%, and the most prevalent diagnostic hypothesis was irreversible acute pulpitis (46.2% of the cases). The demand for care was greater in the age group between 40-59 years (48.6%), in women (64%), in patients without university education (85.3%), and posterior teeth were the most frequently treated (82.7%). There was an association between the presence of pain and medical variables, being that patients with more than two systemic diseases had a higher prevalence of pain. The inadequate completion of dental records was a common finding, which can impair the establishment of the epidemiological profile of these patients and the efficient planning of future dental care services, as well as cause legal problems.

Descriptors: Toothache. Epidemiology. Health Services Research. Emergency Relief. Dental Education.

1 INTRODUCTION

The precarious oral health condition of the Brazilian population is a reflection of the socioeconomic and cultural situation and the inequality of access to dental care. A large part of the population uses dental services offered free of charge by public agencies and educational institutions due to the high cost of private practice¹. Often, dental emergency services act as a “gateway” for patients to the public health system, especially for those who cannot routinely access the dental service, for longitudinal monitoring of their oral health^{2,3}.

In Dentistry, emergencies are extremely common, especially those caused by aggressive agents of the dental pulp, causing a hard pain to bear⁴ and a high degree of anxiety⁵. Such pain is a consequence of inflammatory reactions that the pulp manifests when attacked, with dental caries being the main etiological factor^{6,7,8}. Thus, most dental emergencies are triggered by pulp alterations (pulp pathologies) or alterations in the apical periodontium (periapical pathologies)^{1,2,6,8,9}.

Other conditions can also lead patients to seek an emergency room. According to the Technical Note of the Surveillance and Monitoring Management in Health Services/ General Management of Technology in Health Services/ Brazilian National Health Surveillance Agency (ANVISA) N° 04/2020, developed due to the pandemic caused by the new coronavirus (SARS-CoV-2), the following dental procedures are classified as an emergency: acute odontogenic pain (pulpitis), pericoronitis, alveolitis, dental or periodontal abscesses, dental fracture resulting in pain or trauma to oral soft tissues, need for dental treatment prior to a critical medical procedure, cementation of fixed crowns and prostheses, biopsies, adjustments of orthotics and prostheses that are causing

pain and/or compromised masticatory function, completion of treatment or change of intracanal medication, removal of extensive carious lesions or restorations that are causing pain, treatment of tissue necrosis, mucositis and dental trauma with avulsion or dislocation¹⁰.

The main complaint in most emergency care is the presence of pain^{1,6}. Pain is conceptualized as a complex phenomenon and a multidimensional experience that involves sensory responses and cognitive, emotional, conceptual, cultural, and motivational aspects¹¹. Several local and systemic factors such as age, gender, general health status, affected dental group, pulp and periapical status, occlusal contacts, among others, can interact and modulate the occurrence of dental pain¹². Patients who complain of pain need immediate care, as the pain harms their quality of life, causing suffering, a drop in professional performance, learning, and difficulties in social interaction¹³.

In this context, it is imperative to study emergency situations in Dentistry, as they are a reality experienced in the daily life of the dental clinic¹⁴. Dental surgeons must know the clinical and radiographic characteristics of pathologies to determine a correct diagnosis and, consequently, an adequate management of patients who seek emergency care⁶. Thus, it is reasonable to assume that dental surgeons' education allows them to contact individuals with acute pain conditions¹⁵. However, there is a gap in the training of dentistry professionals regarding the differential diagnosis and approach in emergencies in their dental offices¹⁶.

Several studies have been carried out to trace the epidemiological profile of patients treated in emergency dental services in Brazil^{1,2,8,9,17} and other countries^{3,18-20}. Despite

some similarities in the results, marked differences are identified. They can be attributed to the heterogeneity of the populations evaluated, location of collection (dental teaching clinics, university hospitals, emergency services or primary care), period and form of data collection, and socioeconomic characteristics in the region²¹. Data analysis from such surveys can help develop strategies to improve emergency dental services, especially in dentistry courses, promoting quality care and social commitment²².

Despite the studies above, it is clear that there are still little government data and information in the literature regarding the characterization of demand and the association of the presence of pain in emergency care with variables related to socioeconomic, medical and dental characteristics. This fact justifies this research, which evaluated the outcome of pain and associated factors in patients treated at an emergency service from the Dental School at the Federal University of Santa Maria, in Santa Maria/RS, Brazil.

2 METHODOLOGY

This study was previously approved by the Research Ethics Committee of the Federal University of Santa Maria (UFSM), CAEE: 02114818.4.0000.5346. The sample of this cross-sectional study consisted of 137 dental records of patients treated in an extension project for training in emergency dental care at the UFSM, located in the city of Santa Maria, in the central region of the state of Rio Grande do Sul, from April 2017 to December 2018. Eligibility criteria for sample selection were: having the standard clinical form of the extension project completed and the appropriate signature of the consent form for the use of information with academic purposes.

The data in the clinical record, self-

reported by the patients, were collected, and variables related to socioeconomic, medical and dental characteristics were submitted to statistical analysis. For data analysis, the variables were categorized into age groups (0-19 years; 20-39 years; 40-59 years; ≥ 60 years)²³⁻²⁵, gender (female; male), education (higher education; no higher level), associated systemic diseases (patients who did not report having any type of disease; with 1 disease; 2 or more diseases) and type of affected tooth (anterior; posterior). Regarding medical history, the following pathological conditions were observed: diabetes mellitus, hypertension, heart disease, cancer, anemia, hemophilia, hepatitis, Acquired Immunodeficiency Syndrome (AIDS), gastric problems, kidney problems, osteoporosis, tuberculosis, neurological or psychological diseases (depression, epilepsy and other psychiatric problems).

Data were analyzed using the STATA 14 program (Stata Corporation, College Station, TX, USA). The presence of pain when arriving at the emergency room was the study outcome. Initially, a descriptive analysis of the variables was performed, resulting in absolute and relative frequencies (Table 1). In addition to descriptive analysis, unadjusted analyzes were performed to provide summary statistics and preliminary assessments of the association between the presence of pain in emergency care and variables related to socioeconomic, medical, and dental characteristics. The final model was adjusted for the final predictor variables (age group, sex, education, disease and type of tooth) using multivariate Poisson regression analysis. The results were expressed as prevalence ratios (PR) and their respective 95% confidence intervals (95% CI). The construction of the model was carried out using theoretical-epidemiological criteria.

3 RESULTS

A total of 137 patients comprised the sample, with ages ranging from 15 to 95 years and a mean of 42.59 (± 16.52) years. The prevalence of pain reported upon arriving at the emergency department was 65.2%. The predominant diagnostic hypotheses were irreversible acute pulpitis (46.2%) and acute dentoalveolar abscess (13.2%). Cases without direct endodontic involvement, i.e. without pulpal or periapical alterations, comprised 17.9% of the sample and consisted of dental fracture, dental trauma, prosthesis cementation, carious lesions, periodontal abscess, pericoronitis and alveolitis.

Table 1 shows the occurrence of pain according to socioeconomic, medical and dental characteristics. Notably, there is a divergence between the number of patients evaluated in each variable and the total sample size. This fact was due to a lack of information, i.e. incomplete filling of the respective fields in some dental records. From the information collected, it was found that the demand for care was greater in the age group between 40-59 years (48.6%), females (64%) and patients without higher education (85.3%). A total of 57.1% of patients who reported having two or more diseases had pain in emergency care. Furthermore, the most frequently treated teeth were posterior (82.7%).

Table 1. Occurrence of pain according to socioeconomic, medical and dental characteristics

Variables	Pain	
	No	Yes
	n (%)	
<i>Age group (n=136)</i>		
0-19 years	11 (69.2)	5 (30.8)
20-39 years	28 (72.8)	11 (27.8)
40 -59 years	38 (58.2)	28 (41.8)
≥ 60 years	11 (72.7)	4 (27.3)
<i>Sex (n=136)</i>		
Female	57 (65.3)	30 (34.7)
Male	32 (65.1)	17 (34.9)
<i>Education (n=116)</i>		
Higher level	11 (63.2)	6 (36.8)
No higher level	71 (71.4)	18 (28.6)
<i>Systemic diseases (n=135)</i>		
None	59 (76.1)	19 (23.9)
1 disease	17 (55.6)	14 (44.4)
2 or more diseases	11 (42.9)	15 (57.1)
<i>Type of tooth (n=127)</i>		
Anterior	12 (56.3)	10 (43.7)
Posterior	70 (66.3)	35 (33.7)

As shown in table 2, in the crude analysis, the variables patients who reported having a type of systemic disease and patients with two or more diseases were associated with a greater presence of pain when arriving at the

emergency room ($p < 0.05$). After adjustment, patients with two or more diseases had a higher prevalence of pain ($p < 0.05$), with a 2.85 times higher prevalence of pain than those without any disease.

Table 2. Crude and adjusted analysis of the association between the presence of pain in emergency care and variables related to socioeconomic, medical and dental characteristics

Variables	PR (CI 95%) Crude	p	PR (CI 95%) Adjusted	p
<i>Age group</i>				
0-19 years	1.0		1.0	
20-39 years	0.90(0.34-2.39)	0.837	0.60(0.22-1,65)	0.322
40 -59 years	1.36(0.56-3.27)	0.493	0.77(0.30-2,02)	0.601
≥ 60 years	0.89(0.25-3.15)	0.852	0.54(0.15-1,92)	0.344
<i>Sex</i>				
Female	1.0		1.0	
Male	1.00(0.60-1.69)	0.986	1.33(0.77-2.29)	0.306
<i>Education</i>				
Higher level	1.0		1.0	
No higher level	0.78(0.32-1.87)	0.573	0.80(0.27-2.43)	0.701
<i>Systemic diseases</i>				
None	1.0		1.0	
1 disease	1.86(1.02-3.40)	0.044*	1.70(0.82-3.50)	0.152
2 or more diseases	2.39(1.35-4.22)	0.003*	2.85(1.48-5.47)	0.002*
<i>Type of tooth</i>				
Anterior	1.0		1.0	
Posterior	0.77(0.41-1.44)	0.415	0.85(0.45-1.58)	0.606

PR = Prevalence Ratio (Poisson Regression model)

4 DISCUSSION

Epidemiological studies in emergency care services seek to help in decision-making to solve specific problems²⁶, in addition to helping to plan future interventions in individual and collective health²⁷. Thus, this study evaluated the outcome of pain and associated factors in patients treated at an emergency room linked to the UFSM Dentistry Course.

From the information collected in the

dental records, it was found that the age group that most sought emergency care was that between 40-59 years old (48.6%), and the search was greater among females (64%). In general, female individuals seek health services more than those of the opposite sex²⁸. Some studies^{2,17,29,30} emphasize that this discrepancy between the sexes is due to women's greater interest in taking care of their teeth and their appearance. In Brazil, according to data from the Brazilian Institute of

Geography and Statistics - IBGE, the female population is larger than the male population, which could also explain the results presented in this study³¹. However, other researchers observed that men were more frequently affected by dental emergencies than women^{32,33}. This variety of results across studies can be attributed to the heterogeneity of the populations investigated and the socioeconomic characteristics in the places where the data were collected²¹.

Literature has reported an association between oral health status and socioeconomic profile, more specifically, the influence of educational level on the population's attitude towards seeking dental care^{22,34}. The lowest levels of education are related to worse oral health conditions, as they seem to reduce the concern with the aggravations of diseases and preventive care³⁵. Most of the population that sought emergency care in this study did not have higher education (85.3%), demonstrating a low socioeconomic profile. This fact is in line with the results obtained in other research, showing that the lower socioeconomic level³⁶ and the financial difficulty³⁷ motivate the search for free dental emergency services.

The most frequently treated teeth were posterior (82.7%), which was also observed in a study carried out at the Center for Dental Specialties in Endodontics, Federal University of Rio Grande do Sul³⁸. In such research, posterior teeth accounted for 60.3% of the sample. Such findings can be explained by the complex anatomy of the posterior teeth and the difficulty of access, which hinders the performance of proper cleaning, causing a higher prevalence of caries and, consequently, of pulp/periapical pathologies³⁹.

Despite the reduction in the prevalence of dental caries in Brazil, a large portion of the population, especially those who do not have

guaranteed dental care, seek urgent dental treatment for pain relief⁷. Thus, pain is the main reason for seeking urgent dental care. As described in a previous study, most cases of pain with dental origin are caused by endodontic problems, among which symptomatic irreversible pulpitis is the most common. Consequently, the most performed treatment is pulpectomy, demonstrating the significant presence of dental caries in the population¹. In the present study, endodontic treatment was required in 70.5% of the cases treated, and the diagnosis of symptomatic irreversible pulpitis was observed in 46.2% of these cases.

Although the treatment carried out during emergency care is temporary, the patient needs to have his main complaint resolved and then be referred to continue treatment⁴⁰. Thus, it is common for dentists to come across patients with acute pain from different origins in clinical practice. However, due to the screening process carried out in Dental Schools, undergraduate students often do not have contact with the individual in a pain crisis. The extension project evaluated in this study allows undergraduates to experience cases of this nature, substantially contributing to their academic training¹⁵.

The emergency clinic can be developed within the courses or in partner health services and is an enriching experience for undergraduates in Dentistry, as it allows them to develop diagnostic capacity since they will be treating unscreened patients, that is, they will not know the patient's need for treatment, *a priori*. In general, students have difficulty in establishing a diagnosis due to the fragmentation of disciplines: diagnosis in periodontics, endodontics, pediatric dentistry, surgery, among others^{15,41}.

It should be noted that emergency

clinics in courses also have limitations. In most cases, it is the student's first contact with the patient in a pain crisis, and there is a need for a quick diagnosis, clinical reasoning and decision-making. Such attitudes end up falling on the teacher. Thus, emergency clinics in the teaching environment end up not being ideal for providing adequate dental education, with the development of these skills and abilities in undergraduate students. The impact on the training of dentists is greater when the internship takes place in health services, which allow for evidence of the relationship between the occurrence of emergencies and the patients' life situations⁴¹.

Several systemic factors, including general health, can modulate the occurrence of dental pain¹². In the present study, patients with 2 or more diseases had a higher prevalence of pain. This result can be explained by the established knowledge that patients with a higher burden of chronic diseases are predisposed to odontogenic infections⁴². Evidence suggests that serum levels of inflammatory markers are increased in patients with cardiovascular diseases⁴³, as well as in patients with apical periodontitis⁴⁴. Furthermore, a relationship between inflammatory markers and pain is also suggested⁴⁵. It should be considered that the health-disease process is multicausal, that is, multiple factors interrelated in causality networks are attributed to the genesis of diseases⁵.

In recent decades, a recurrent issue in scientific research concerns the oral health-systemic disease interaction, in which the immunological impairment caused by systemic alteration can contribute to the maintenance of oral diseases^{46,47,48}. Another possible explanation for the higher prevalence of pain in patients with systemic impairment is related to the psychological profile of extreme anxiety in

such patients. Psychological, emotional and behavioral events also have the ability to transform the understanding and interpretation of painful stimuli, making phobic patients more susceptible to pain⁴⁹. The biological reasons for the present study's finding are not fully understood and need to be evaluated in future research specifically designed to test the hypothesis of the influence of general health status on pain of dental origin.

Finally, it is necessary to highlight the divergence between the number of patients evaluated in each variable and the total sample size (n=137). This fact was due to the absence of fields filled in or filled in incorrectly. This failure in filling out dental records was also reported in other studies^{6,38}. Correctly filling out the dental records is essential for knowing the demands of the educational institution, tracing the profile of patients and enhancing the service's resoluteness. The academic student must also be aware of the legal aspects of dental records and the need for a standardized filling, ranging from the anamnesis to the treatment plan and description of procedures, thus avoiding future legal problems^{38,50}.

Studies that trace the profile of the population served in the clinics of Dental Schools, associating it with clinical outcomes, allow us to predict the main demands in emergency care. This information is of great value to assess the importance of the emergency service in the institution involved, improve the logistics of care, and analyze the course's educational process. The reflection of this is the formation of dentists trained to handle situations of dental urgency and, according to the National Curriculum Guidelines for Undergraduate Courses in Dentistry⁵¹, based on ethical and legal principles and on the understanding of the social, cultural and economic reality of its

environment, directing its performance towards the transformation of reality for the benefit of society.

5 CONCLUSION

The epidemiological profile of patients treated at the emergency department at the UFSM Dental School includes patients aged 40-59 years, female, without higher education, with involvement of posterior teeth in most of the sample. There was an association between pain and medical variables, and patients with more than two systemic diseases had a higher prevalence of pain when arriving at the emergency room. The importance of filling in the dental records must be constantly reinforced in Dental Schools, being essential to correctly trace the epidemiological profile of patients and efficiently schedule future appointments, in addition to preventing possible legal problems.

RESUMO

Dor e fatores associados em pacientes atendidos em um serviço de urgência odontológica no sul do Brasil

O objetivo deste estudo transversal foi avaliar o desfecho dor e fatores associados em pacientes atendidos em um serviço de urgência odontológica no sul do Brasil. Foram avaliados 137 prontuários provenientes de um projeto de extensão para capacitação em atendimento odontológico de urgência da Universidade Federal de Santa Maria (Santa Maria/RS), referentes ao período de abril de 2017 a dezembro de 2018. Os dados contidos na ficha clínica, autorrelatados pelos pacientes, foram coletados e variáveis relacionadas às características socioeconômicas, médicas e odontológicas foram submetidas à análise estatística descritiva e regressão de Poisson multivariada. A prevalência de dor nestes pacientes foi de 65,2% e a hipótese diagnóstica mais prevalente foi de pulpite aguda irreversível (46,2% dos casos). A procura por atendimento

foi maior na faixa etária entre 40-59 anos (48,6%), no sexo feminino (64%), em pacientes sem nível superior (85,3%) e os dentes mais frequentemente tratados foram os posteriores (82,7%). Houve associação entre a presença de dor e variáveis médicas, sendo que os pacientes com mais de duas doenças sistêmicas apresentaram maior prevalência de dor. O preenchimento inadequado dos prontuários odontológicos foi um achado comum, o que pode prejudicar o estabelecimento do perfil epidemiológico destes pacientes e o planejamento dos atendimentos futuros de forma eficiente, além de poder acarretar problemas jurídicos.

Descritores: Odontalgia. Epidemiologia. Pesquisa sobre Serviços de Saúde. Socorro de Urgência. Educação Odontológica.

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