

Dental pain as the reason for visiting a dentist in a Brazilian adult population

Josimari Telino de Lacerda^a, Eliana Maria Simionato^b, Karen Glazer Peres^a, Marco Aurélio Peres^c, Jefferson Traebert^a and Wagner Marcenes^d

^aUniversidade do Sul de Santa Catarina (UNISUL). Tubarão, SC, Brasil. ^bEscola de Aperfeiçoamento Profissional da Associação Brasileira de Odontologia. Florianópolis, SC, Brasil. ^cDepartamento de Saúde Pública. Universidade Federal de Santa Catarina (UFSC). Florianópolis, SC, Brasil. ^dCenter for Oral Biometrics. Queen Mary School of Medicine and Dentistry. Barts and The London. University of London. London, UK

Keywords

Toothache, epidemiology. Oral healthcare services. Prevalence. DMFT index. Socioeconomic factors.

Abstract

Objective

The occurrence of orofacial pain and chronic pain are frequent subjects for study today, but few studies have been made on dental pain in Brazil. The objective of the study was to assess the prevalence of dental pain and the associated factors as the reason for visiting a dentist among adults.

Methods

A cross-sectional study was carried out among 860 workers aged 18-58 years at a cooperative located in the State of Santa Catarina, in 1999. The clinical examinations and interviews were carried out by dentists who had received prior guidance. Complaints of dental pain as the reason for the last visit to a dentist were analyzed as the dependent variable, in relation to the socioeconomic and demographic conditions, access to dental services, shift pattern and caries (via the DMFT index), as the independent variables. Non-conditional multiple logistic regression analysis was utilized.

Results

The prevalence of dental pain as the reason for the last visit to a dentist was 18.7% (CI 95%: 15.9-20.1) and the mean DMFT index (decayed, missing and filled teeth) was 20.2 (CI 95%: 19.7-20.7), with 54% represented by the 'missing' component. The following were independently associated with the presence of dental pain: schooling of less than or equal to eight years (OR=1.9; CI 95%: 1.1-3.1); four to fifteen teeth lost due to caries (OR=2.6; CI 95%: 1.4-4.9); 16 to 32 teeth lost due to caries (OR=2.5; CI 95%: 1.1-5.8); and not having visited the company's dental service (OR=2.8; CI 95%: 1.6-5.1).

Conclusions

Dental pain reflects the severity of the dental caries, expressed by the 'missing' component of the DMFT and non-usage of the company's dental services. These factors are determined by social conditions and represented by the schooling level.

INTRODUCTION

It is estimated that 30 million Brazilians have never visited a dentist⁴, even though the country has one of the biggest numbers of dentists in the world, both in absolute terms and in relation to the size of the population, as established by the World Health Organization.¹⁵ The dental attendance and assistance provided

by the public sector in Brazil almost exclusively prioritizes school children between the ages of 6 and 12 years, except for a few isolated municipalities in which the healthcare attention has also been directed towards other age groups within the population. Targeted actions, which in the majority of cases have been centered on the reparative and extractive attendance offered to the adult population throughout

Correspondence to:

Josimari Telino de Lacerda
Rua Padre Rohr, 2089
88051-400 Florianópolis, SC, Brasil
E-mail: jtelino@terra.com.br

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the history of public policies in Brazil, did not undergo significant alteration after the implementation of the Single Healthcare System in 1990. Among other attributes, this established the principles of universality, completeness and equality.

With the decline in dental caries among school-age children, seen in the latest epidemiological surveys performed in 1986⁷ and 1996¹² and, especially, with the inclusion of the oral healthcare team in the Family Healthcare Program by the Ministry of Health in 2000, it has become indispensable for other groups within the population to be considered. Because of the systematic exclusion of the adult population from dental services, this population has been directed towards the emergency dental services, in most cases because of pain. Within the field of medicine, pain is responsible for one-third of consultations made in Brazil.¹³ Pain is defined by the International Association for the Study of Pain (IASP) as “a disagreeable sensory and emotional experience” of subjective nature that is associated with real or potential injuries, in which “each individual utilizes the word according to the individual’s learning from previous experience”. Pain has historically been considered to be only a symptom, from which the characteristics will guide the diagnosis of morbidities, in the teachings of the health sector.¹⁴

Within the field of dentistry, recent studies have pointed towards the pressing need for greater attention in this respect. According to Ekanayake & Mendis¹ (2002), dental pain is a significant predictor of the utilization of dental services. A study on oral health among adults with teeth in the United Kingdom indicated that pain was the most frequent problem over the preceding 12-month period (40%), thus interfering directly with these individuals’ daily activities.⁸

In Brazil, studies on orofacial pain have mostly related to temporal-mandibular dysfunctions. No Brazilian publications regarding epidemiological data on dental pain were found in the Medline, Lilacs and BBO databases for the period from 1994 to 2002, when the terms ‘*dental pain*’ and ‘*toothache*’ were utilized.

The present study had the objectives of determining the prevalence of dental pain as the main reason for the last visit to a dentist among a group of workers in the State of Santa Catarina, Brazil, and verifying the existence of an association with socioeconomic conditions, working conditions and access to dental services.

METHODS

A cross-sectional study was performed among all

the workers of the West-Central Cooperative of the State of Santa Catarina, at its unit in the municipality of Maravilha, Santa Catarina, Brazil, in 1999 (N=860). Maravilha is located in the western region of the state, and is a predominantly urban municipality with less than 30% of its population residing in the rural zone. The biggest local economic activity is in the cold-storage sector. The research sample was made up of workers aged between 18 and 58 years.

A structured questionnaire was applied to determine the prevalence of dental pain as the reason for the last visit to a dentist. The questionnaire also investigated demographic characteristics, socioeconomic attributes, working conditions (shift pattern) and information on access to and type of dental services utilized. The workers were also examined by one of the authors of the present study (EMS), in order to obtain information on the prevalence and severity of the dental caries, by means of the DMFT index (decayed, missing and filled teeth), utilizing the criteria established by the World Health Organization.¹⁵

The objectives, importance of the research and main characteristics of the study were explained by means of correspondence. There was prior contact with the company’s management to obtain the authorization needed for performing the research. In addition to this, the workers’ informed consent was obtained.

The examinations and interviews were held in the company’s dental consultation office, under artificial illumination. During the clinical examinations, a visual inspection was made using clinical mirrors and wooden spatulas, and all the biosafety norms were rigorously complied with.

The preparatory stages of the study consisted of intra-examiner standardization, pretesting of the questionnaire and a pilot study on a group of individuals of similar age to the population studied, who were living in a rural family housing project. During the data collection, duplicate examinations were performed on 10% of the sample, to verify the intra-examiner diagnostic concordance. This was gauged via the Kappa statistical test, tooth by tooth.

Calculations were made of the frequency distribution and the chi-squared (χ^2) association was tested to evaluate the relationship between the dependent variable and the independent variables. The odds ratios (OR) and respective confidence intervals (CI) were estimated and, finally, non-conditional multiple regression analysis was performed. The dichotomous (yes/no) dependent variable was the presence of dental pain as the reason for the last visit to a den-

Table 1 - Association between dental pain as the reason for the last visit to a dentist and risk factors, among a group of workers at the West-Central Cooperative. Maravilha, Santa Catarina, 1999.

Variable (categories)	Presence of pain		Total N(%)	Raw odds ratio (OR _i) OR _i (CI 95%)	p*
	Yes (%)	No (%)			
Income					0.909
≥5 MS	18 (20.5)	70 (79.5)	88 (100.0)	1.0	
<5 MS	119 (21.0)	448 (79.0)	567 (100.0)	1.0 [0.6-1.8]	
Schooling					0.001
>8 years	27 (13.2)	178 (86.8)	205 (100.0)	1.0	
≤8 years	110 (24.4)	341 (75.6)	451 (100.0)	2.1 [1.3-3.4]	
Last visit to a dentist					0.281
≤6 months	75 (19.6)	307 (80.4)	382 (100.0)	1.0	
>7 months	66 (23.1)	220 (76.9)	286 (100.0)	1.2 [0.8-1.8]	
DMFT in quartiles					0.019
0-14	21 (13.4)	136 (86.6)	157 (100.0)	1.0	
15-20	39 (23.5)	127 (76.5)	166 (100.0)	2.0 [1.1-3.6]	
21-24	29 (19.3)	121 (80.7)	150 (100.0)	1.6 [0.8-2.9]	
25-32	52 (26.5)	144 (73.5)	196 (100.0)	2.3 [1.3-4.1]	
M component (DMFT)					0.001
0-3	23 (11.0)	187 (89.0)	210 (100.0)	1.0	
4-15	62 (25.5)	181 (74.5)	243 (100.0)	2.8 [1.7-4.7]	
16-32	56 (25.9)	160 (74.1)	216 (100.0)	2.8 [1.7-4.8]	
Type of service utilized					0.018
Company	115 (19.7)	469 (80.3)	584 (100.0)	1.0	
Others	26 (31.0)	58 (69.0)	84 (100.0)	1.8 [1.1-3.0]	
Shift pattern					0.308
Morning	59 (19.3)	247 (80.7)	306 (100.0)	1.0	
Afternoon	77 (23.4)	252 (76.6)	329 (100.0)	1.3 [0.8-1.9]	
Night	5 (15.2)	28 (84.8)	33 (100.0)	0.7 [0.3-2.0]	
Age					0.144
18-24	29 (15.9)	153 (84.1)	182 (100.0)	1.0	
25-29	36 (22.8)	122 (77.2)	158 (100.0)	1.6 [0.9-2.7]	
30-34	30 (19.9)	121 (80.1)	151 (100.0)	1.3 [0.7-2.3]	
35 or over	40 (25.8)	115 (74.2)	155 (100.0)	1.8 [1.1-3.1]	
Sex					0.630
Male	85 (20.5)	330 (79.5)	415 (100.0)	1.0	
Female	56 (22.0)	198 (78.0)	254 (100.0)	1.1 [0.6-1.6]	

*chi-squared descriptive level with Yates correction

MS: minimum salary (1999)

DMFT: decayed, missing and filled teeth

tist. The independent variables analyzed were age, sex, monthly income in numbers of minimum salaries at the time of performing the study, schooling in years of study, type of dental service utilized, last visit to a dentist, shift pattern, and also the prevalence and severity of dental caries. The independent variables were inserted into the logistic model in an increasing manner, in accordance with their statistical significance ($p < 0.20$). These remained in the model if they continued to be significant ($p < 0.05$) and/or modified the model. The stepwise forward procedure was adopted in the SPSS version 10.0 statistical software. The statistical modeling adopted allowed the independent impact of each variable studied to be evaluated. The variables sex, age and shift pattern were utilized as controls, independent of the statistical significance presented.

RESULTS

Out of the company's 860 employees, 754 workers (87.7%) were examined and interviewed. Individuals who were off work due to disability, health problems, vacations or traveling on company business (88 cases) and those who refused to answer the questions during the interview (18 cases) were considered to have been lost from the survey. Of those interviewed,

458 (60.7%) were male and 296 (39.3%) were female. The workers' ages ranged from 18 to 58 years, with 201 individuals (26.7%) between 18 and 24 years, 179 (23.7%) between 25 and 29 years, 166 (22.0%) between 30 and 34 years, and 208 (27.6%) between 35 and 58 years of age.

Throughout the data collection, the concordance was maintained at satisfactory levels, with a lowest Kappa value of 0.81.

The prevalence of dental pain as the reason for the last visit to a dentist among the workers studied was 18.7% (CI 95%: 15.9-20.1). The average DMFT index was 20.2 (CI 95%: 19.7-20.7), and the M component (missing due to caries) had the greatest magnitude, totaling 54.1%, with an average number of teeth missing of 11.0 (CI 95%: 10.34-11.66). The F component (fillings) formed 42% of the index total, and the average number of filled teeth was 8.5 (CI 95%: 8.09-8.91). The D component (decayed teeth) formed 3.9% of the DMFT index, and the average number of teeth presenting caries was 0.7.

Table 1 presents the result from the univariate analysis. The following variables were statistically associated with dental pain as the reason for the last

visit to a dentist: schooling of eight years or less ($p < 0.001$); 15 or more teeth attacked by caries (DMFT³15) ($p = 0.019$); four or more teeth missing due to caries ($p < 0.001$); non-utilization of the company's dental service ($p = 0.018$).

The shift pattern, sex and age of the employees did not present any significant association with complaints of dental pain at the last visit to a dentist. These were, however, kept in the model for controlling the final modeling.

The results from the multiple analysis are presented in Table 2. Schooling of less than or equal to eight years continued to be associated with complaints of dental pain at the last visit to a dentist, after adjustment for the variables sex, age and shift pattern, and the other variables of the model (OR=1.9; CI 95%: 1.1-3.1). The number of teeth missing due to caries remained associated with dental pain as the reason for the last visit to a dentist, independent of the control variables, the schooling, the type of dental service utilized by the individual and the severity of the caries. Individuals with 4 to 15 teeth missing due to caries had a 2.6 times greater chance of presenting dental pain as the reason for the last visit to a dentist (CI 95%: 1.4-4.9), and those with 16 to 32 teeth missing had a 2.5 times greater chance of presenting the same situation (CI 95%: 1.1-5.8). Individuals who utilized dental services other than the company's had a 2.8 times greater chance that dental pain was the main reason for visiting a dentist (CI 95%: 1.6-5.1), independent of the other variables studied.

DISCUSSION

The response rate obtained for dental pain as the reason for the last visit to a dentist was 87.7%, which

contributes to the internal validity of the study. Moreover, the losses from the study did not interfere in the results, since these presented a balanced distribution across the different segments of the population studied. Nonetheless, despite actively seeking the missing people during the data collection period, it must be considered possible that the results have underestimated the prevalence of pain at the last visit to a dentist, since the individuals who were more ill may have been absent from work at the time of the examination and interview. On the other hand, the reproducibility of the data was ensured by the process of training and standardization that the research went through, and also by the high concordance obtained through the Kappa test.

The population studied represented 10% of the adult population and one-third of the salaried population of the municipality. These percentages do not guarantee that the results regarding dental pain as the reason for the last visit to the dentist can be generalized for the adult population of the municipality, nor do they for adult populations in other regions of Brazil. Furthermore, it has been considered hypothetically that the results from this working population that was attended by dental services would be better than among the non-working population. No population-based information about dental pain among adults is available. It is considered that it would be difficult to extrapolate these findings to other populations, and even to the remainder of this municipality's population, as pointed out above, since the working population in the present study had a high degree of access to dental services, which is not commonly seen in Brazil.

Pain has become a frequent topic for studies nowadays. Among the motives for studying pain are its

Table 2 - Risk factors for dental pain as the reason for the last visit to a dentist among a group of workers at the West-Central Cooperative. Multiple regression analysis. Maravilha, Santa Catarina, 1999.

Variable (categories)	Raw odds ratio (OR _r) OR _r (CI 95%)	p _r *	Adjusted odds ratio (OR _a) OR _a (CI 95%)	p _a **
Schooling		0.001		0.020
>8 years	1.0		1.0	
≤8 years	2.1 [1.3-3.4]		1.9 [1.1-3.1]	
M component (DMFT)		0.001		0.010
0-3	1.0		1.0	
4-15	2.8 [1.7-4.7]		2.6 [1.4-4.9]	
16-32	2.8 [1.7-4.8]		2.5 [1.1-5.8]	
Type of service		0.018		<0.001
Company	1.0		1.0	
Others	1.8 [1.1-3.0]		2.8 [1.6-5.1]	
DMFT in quartiles		0.019		0.474
0-14	1.0		1.0	
15-20	2.0 [1.1-3.6]		1.5 [0.8-2.9]	
21-24	1.6 [0.8-2.9]		1.0 [0.5-2.1]	
25-32	2.3 [1.3-4.1]		1.3 [0.6-2.9]	

*p-value via chi-squared test, with Yates correction

**controlled for sex, age and shift pattern

DMFT = decayed, missing and filled teeth

relationship with new lifestyles, greater individual longevity and the consequent prolongation of survival with affections, and environmental modifications.¹⁴ Dental pain is the most frequent symptom among different types of orofacial pain that have been studied⁶ and is a significant determiner for seeking out attendance services.¹

The prevalence of dental pain as the reason why the adults in the present study sought out dental services was similar to what was found in a survey performed in Sri Lanka on the demand for dental services at a university hospital (23%).² This is also corroborated by the findings on the prevalence of dental pain from studies among industrial workers in Malaysia (18.5%)⁵ and Florida (12%).¹⁰ However, a study performed in Lithuania has indicated a higher prevalence rate for dental or oral pain among adults (55%).⁹ Methodological variations in the collection of information on the different aspects of orofacial pain, among which dental pain, and the particular way that the definition of pain is put into practice, can be put forward as possible explanations for discrepancies among such prevalence.¹⁰

Another characteristic that could contribute towards the discrepancies is the high degree of subjectivity in the perception of pain. Cognitive factors such as knowledge, beliefs and expectations, and also cultural factors, have been associated with differences in the perception of pain.¹¹ In the present study, individuals with a lower level of schooling, and probably a lower level of knowledge, presented a greater chance of consulting a dentist because of dental pain, independent of the other factors studied.

The serious cumulative effects of caries over the course of an individual's life and their significant responsibility for dental suffering and mutilation are another point suggested by the present study. This is corroborated by the findings from a study in Finland, in which dental pain was one of the three biggest causes of tooth extraction³. In the present study, it was seen that the greater the loss of teeth had been, the greater the chances were that pain was the reason for the last visit to a dentist. Considering that tooth loss was the expression of more than half of the caries attacks, a hypothesis can be considered that the advance of caries causes the pain and the individual's consequent dental mutilation. Caries have historically been dealt with as a problem among children and young people but, as well as tooth loss, they bring in the additional problem of pain. The reper-

cussions of such pain may interfere in individuals' behavior and affect their day-to-day activities.

The data on the severity of dental caries found in this population (DMFT =20.28) corroborate the results from the epidemiological survey performed in Brazil in 1986 for the population aged 35 to 39 years (DMFT =20.9).⁷ This indicates that the severity of caries is possibly maintained within the adult population. The absence of an oral healthcare policy directed towards this population, particularly in Brazil, provides a probable justification for the maintenance of high rates of dental caries. Lack of access to attendance and preventive measures possibly increases the complexity of the problem and may lead to two alternative extremes. On the one hand, tooth extraction may be the only technically possible procedure, in view of the severity of the disease. On the other hand, tooth extraction may be indicated to relieve the pain, in view of the impossibility of access to other types of treatment. Considering that the workers studied had guaranteed access to dental services offered by the company, and that 87% of them made use of these, it is possible that the tooth losses found were due to the severity of the caries.

Nonetheless, the type of service provided for the individual has a significant bearing on the chance that pain will be the reason for seeking out the dentist. The seeking out of dental services other than the company's tripled the chance that dental pain would be the reason for seeking out a dentist. Easier access to dental services and regular periodical follow-up of oral health conditions within the company's environment may, perhaps, explain this result. Another factor, albeit not measured, is the quality of the services provided, with regard to the continuity of the attendance and follow-up of the patient's health, and also the preventive and conservational services in the company's dental attendance. The offer of non-mutilative procedures in the treatment of advanced dental caries, such as endodontic treatment and the construction of dental prostheses, may contribute towards this.

These individuals' schooling levels, the severity of their dental caries, expressed as tooth losses, and the access to their company's own dental services were the factors related to dental pain in the present study. This indicates that, in addition to interfering in the quality of people's lives, pain is also influenced by social conditions and the conditions of access to dental services.

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