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Dental anxiety in an emergency dental service

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ABSTRACT

Objective

The purpose of this study was to assess the frequency of dental anxiety and/or fear among patients in an emergency dental service.

Methods

Research was based on interviews with 252 patients, aged 18 years-old and over, attending a school of dentistry's emergency service in Sao Paulo, Brazil, from August to November, 2001. Two methods were used to measure dental anxiety: the Modified Dental Anxiety Scale (MDAS) and the Gatchel Fear Scale. The study group answered questions concerning major complaint, how much time elapsed since their last visit to the dentist and since the initial symptoms leading to the current visit to the emergency service, level of education, family income and previous traumas. Statistical analysis (χ^2 and Fisher Exact Test) was performed to evaluate these characteristics.

Results

It was found that 28.17% of this sample was dentally anxious, according to the MDAS, and 14.29%, felt fear related to dental treatment according to the Gatchel Fear Scale. Women were more anxious than men at a statistically significant rate (MDAS). The time elapsed since the onset of initial symptoms was more than 7 days for 44.44% of the participants. A large proportion of anxious women returned to treatment during the past year. A previous traumatic experience with dental treatment was identified in 46.48% of the dentally anxious patients. No significant relation between level of education or income and dental anxiety or fear was found.

Conclusions

Dentally anxious patients frequently attend emergency care. Females are more likely to report high dental anxiety than males. Previous experience seems to be an important factor contributing to avoidance of dental care.

Keywords

Dental anxiety. Emergencies. Fear. Socioeconomic factors.

Introduction

One of the difficulties encountered by the clinician during dental care is the fear that some patients express with respect to procedures which will take place during their visit. Coming to their dental appointments may represent a major problem for these patients.

Fear is a primary and powerful emotion which alerts us about imminent danger, with respect to an object or situation. When danger is recognized, the individual reacts with a set of behavioral and neurovegetative responses which are accompanied by a disagreeable sensation.[16]

When danger is not evident, but presents itself in a vague and persistent manner, or when signs of imminent danger are not consciously perceived, it is denominated a state of apprehension, in which the existence of anxiety may be verified.[16] It is not consciously controlled, that is, people do not have the capacity to interrupt it. Anxiety also aggravates psychological suffering caused by pain.

Childhood is the critical period for the development of anxiety. Approximately one fourth of the adult American population regularly avoids dental treatment due to traumatic experiences which occurred during this period.[2]

People who suffer from intense dental fear are known to be more difficult patients among dentists and dental students.[10, 13] Almost 7% of the general population state they suffer from intense fear of dentistry, while another 13% state they feel some degree of fear. In Brazil, there is a 15% prevalence of dental anxiety.[16] While assessing a short version of the Dental Anxiety Inventory, Aartman[1] (1998) found that highly anxious dental patients were most anxious about tooth extraction, followed by drilling.

Rosa & Ferreira[17] (1997) also stated there was an association between fear and poor oral health. This could be the result of less frequent attendance to dental services by patients who fear treatment. Usually, patients who suffer from dental anxiety wait longer periods of time before scheduling an appointment and often cancel it. Among the major reasons given for avoiding dental visits are costs (75.4%) and fear (36.9%) of treatment. Twenty-three percent of the people who did not regularly attend dental services, stated that fear was the reason for non-attendance. [8]

According to Milgrom et al[13] (1988), patients under forty years old may be 1.5 times more anxious than those over forty. Another finding mentioned in the literature is that women tend to report higher levels of anxiety than men.[4,10,11,17]

In emergency dental services, both in private and in dental school clinics, the reason for attendance is, in the majority of cases, a complaint of pain.

Clinical practice suggests that levels of anxiety and fear among emergency patients coming to a clinic are greater than in the general population.

Since a delay in seeking care may be due to dental anxiety or fear, this study proposed to assess the frequency of anxious patients attending a dentistry school's emergency clinic, associating anxiety to the undertaken procedure, time elapsed since the last visit to the dentist, time since the symptoms appeared, previous history of trauma and socio-economic characteristics of the sample.

Methods

Research was based on structured interviews, undertaken with patients who sought the emergency clinic of a dentistry school in the municipality of Sao Paulo between August and November 2001, while waiting to be attended. An average of eight hundred patients of all ages is attended per month at this service. The major complaint, in the majority of cases, was toothache, resulting either from tooth decay and its consequences or from periodontal disease. Inclusion criteria for participating in this study were: being 18 years old or over and agreeing to participate in the investigation and signing a term of informed consent. Patients who did not know how to read were not excluded from this study. In these cases, the term of consent and the questionnaire were read to those who wished to participate. All interviews were conducted by the same person. The patients interviewed were selected by systematic random sampling, comprising a sample of 252 patients (9.1%) among the 2,707 who attended this service during the study period. On the average, seven patients participated in this study per day, in alternate days of the week so as to contemplate all days. One patient was allotted to participate in the investigation among each three who fulfilled the requirements mentioned above. The rate of refusal was small: only 3 of 255 patients who were invited to participate did not agree to fill out the questionnaire.

Patients were characterized according to sex, age, educational level and family income. They were asked questions concerning the time period elapsed since their last visit to a dental service and between the onset of the current symptoms and the present visit to the emergency dental service. Each patient was also asked to state the current complaint, intensity of pain (if he/she was not in pain at the moment of the interview, the patient was asked to reply how intense the pain would have to be, supposing he/she was in pain, for him/her to seek a dentist) and if he/she associated any previous experience with his/her fear of dental treatment. The emergency procedure carried out in each case was also registered.

Dental anxiety was measured by means of two methods: the Modified Dental Anxiety Scale (MDAS) and the Gatchel Fear Scale. Reliability and validity of the Dental Anxiety Scale described by Corah have been demonstrated in several studies. [4,8,10,17]

However, since Corah's original scale, translated to Portuguese by Pereira et al[14] (1995), did not refer to local anesthesia, Humphris et al.[9] introduced an additional question on anesthesia in the MDAS, which was also included in this study. The MDAS is composed of five questions each of which has five alternative answers, ranging from 1 (no anxiety) to 5 (extreme anxiety). Upon answering all five questions, the lowest score possible is five, which would correspond to no anxiety and the highest score possible is twenty five, which would correspond to extreme anxiety. The authors have established that subjects with MDAS scores of 16 and above are dentally anxious whereas those with scores higher than 19 are considered dentally phobic.[9]

The Gatchel Fear Scale is a ten-point fear scale, in which one represents "no fear" and 10 represents "intense fear". Subjects scoring form eight to ten were classified as having a high level of fear.[6]

The data obtained was submitted to statistical analyses, using two non-parametric tests – Chi-squared tests and Fisher Exact Test- to determine the existence of significant differences between the groups.

In order to determine reliability of the MDAS, Cronbach's alpha coefficient, a method utilized to measure internal consistency, was employed.

Validity of the MDAS in discriminating different groups was determined by dividing the sample in four subgroups. The hypothesis that all subgroups analyzed maintained the same mean levels of dental anxiety was tested by calculating the mean variance between groups and the mean variance within each group.

Correlation between the MDAS and the Gatchel Fear Scale was assessed using Spearman's correlation coefficient.

RESULTS

One hundred and forty-eight women and 104 men, varying from 18 to 81 years old were interviewed. Among the patients attending the emergency service, 61.5% (155/252) had come due to pain not associated to any other complaints. Other complaints such as edema, periodontal complaints, bleeding, bad breath, lesions and trauma, occurred in 4.8% (12/252) of the cases. Pain associated to one of the other complaints mentioned above occurred among 17.5% (44/252) of the respondents. Complaints not involving pain, such as removal of sutures, cementation of temporary crowns or professional advice, was the motive for attending the service among 16.3% (41/252) of the patients. The time elapsed between the onset of the current symptoms and the present visit to the emergency dental service was greater than seven days in 44.4% (112/252) of the sample population. And 48.0% (121/252) of the patients stated that, when in pain, they only sought or would seek treatment once the intensity of the pain became unbearable.

The proportion of patients classified as anxious (see Figure 1a) according to the MDAS was 28.2% (71/252). As to the Gatchel Fear Scale, 14.3% (36/252) of the patients presented a high level of fear (see Figure 1b). There was a greater number of anxious women than men, being that statistically significant differences (χ^2 =0.01) between the sexes were observed in relation to the MDAS scores.

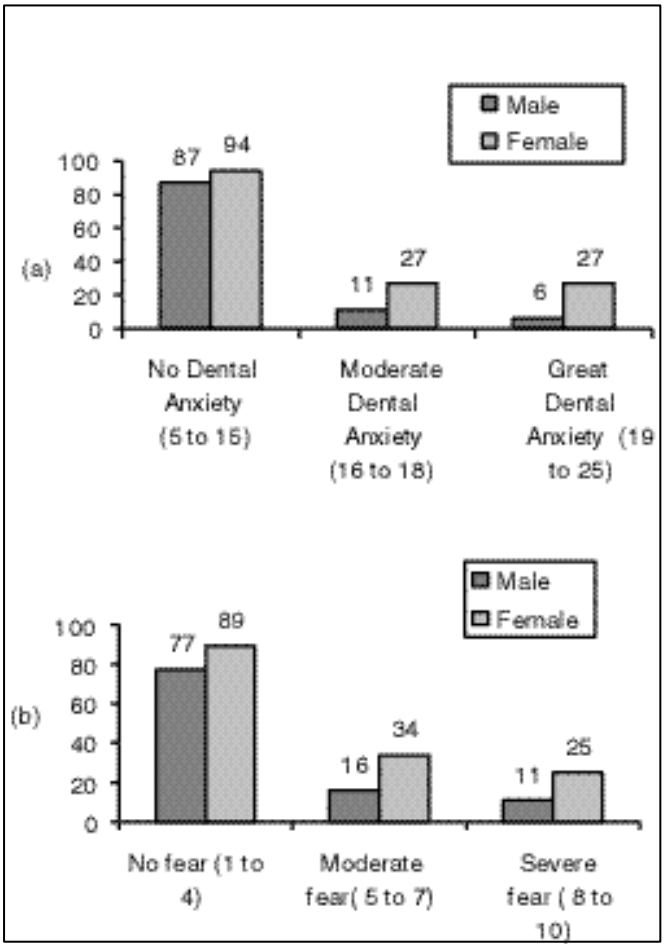

Figure 1 *- Distribution of patients according to the Modified Dental Anxiety Scale (a) and to the Gatchel Fear Scale (b).*

The procedures most frequently carried out were related to endodontics (134/252), followed by those related to periodontics (32/252) and to caries (30/252). No significant difference was found between the group of patients presenting dental anxiety and/or fear and the group of patients who were not anxious ($\chi 2 > 0{,}05$).

Patients were asked how much time had elapsed since the last dental visit and the date of the interview. In the past 12 months, 64.8% (46/71) of the patients who presented dental anxiety had visited the dentist and 70.2% (127/181) of the patients who were not anxious had also done so. Among the anxious patients who sought dental treatment in the past year (46), the majority were women (37). Differences related to the sex of anxious patients who visited the dentist in the previous year were statistically significant ($\chi 2 = 0.01$), according to the MDAS. There were no statistically significant differences between groups who visited the dentist in the previous 12 months, according to the Gatchel Fear Scale ($\chi 2 > 0.05$), nor between groups whose previous visit to the dentist occurred more than twelve months before the interview (Fisher Exact Test: $p > 0.05$).

Time period elapsed between the onset of the current symptoms and the present visit to the emergency dental service did not present statistically significant differences ($\chi 2 > 0.05$) in the MDAS, within the time periods analyzed: up to two days (19 patients whose scores indicated dental anxiety, 54 whose scores indicated there was no dental anxiety); from three to seven days (19 anxious patients, 48 patients with no anxiety); and, more than seven days (33 anxious patients, 79 patients with no anxiety). However, there were statistically significant differences, according to the Gatchel Fear Scale, between the group who waited up to two days to seek treatment (57) and the group who waited from three to seven days to do so (64), at a level of 1%.

Among the respondents, there were no statistically significant differences between age groups and anxiety and/or fear ($\chi^2 > 0.05$). The distribution of the sample in age groups according to both MDAS and Gatchel Fear Scale scores is presented in Figure 2.

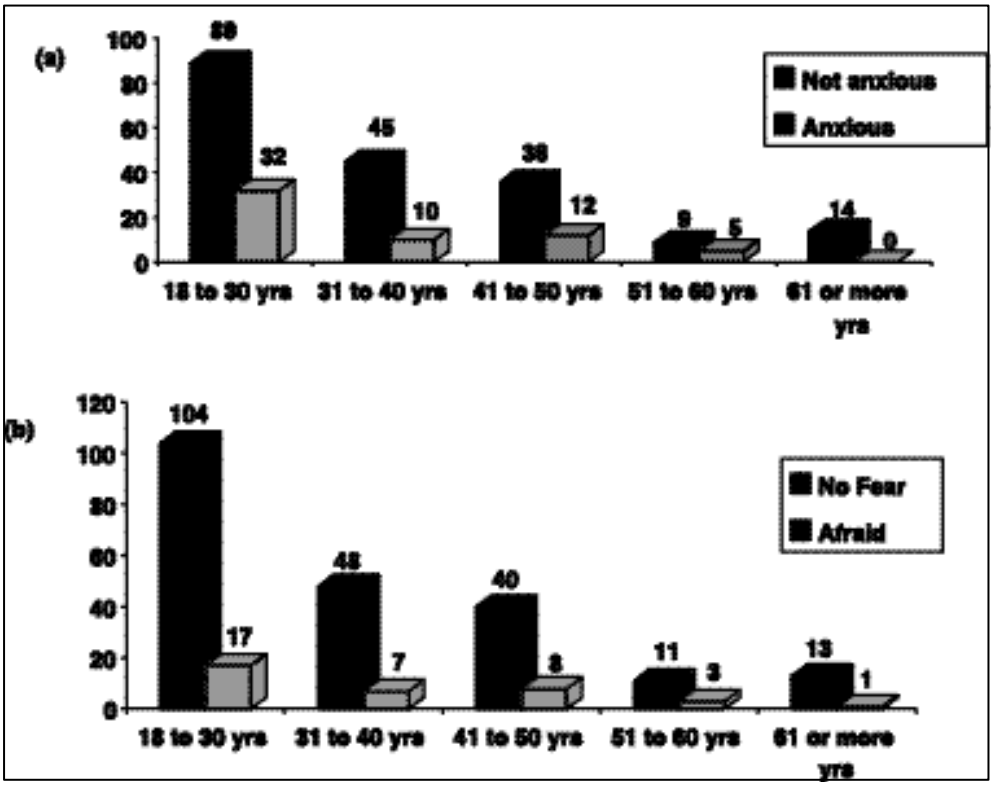

Figure 2 - *Distribution* of patients in relation to age groups according to Corah (a) *and Distribution of patients in relation to age group according to the Gatchel Fear Scale (b).*

Among the 252 patients interviewed, 55 stated they had a previous traumatic experience. A previous tooth extraction was reported by 17 patients; 11 patients were afraid of local anesthesia, 7 were afraid of drilling and the remaining 20 patients referred to diverse past experiences. Previous trauma was identified in 46.5% (33/71) of the patients who presented dental anxiety, according to MDAS scores. There were statistically significant differences between this group and that of the patients with no anxiety ($\chi^2 = 0.01$).

As to family income, Table 1 indicates that there were no statistically significant differences among groups when they were compared to one another ($\chi^2 > 0.05$). The proportion of patients who presented dental anxiety, according to MDAS scores or who were classified as presenting a high level of fear, according to the Gatchel Fear Scale, were not distributed in a significantly different manner

among the group composed of respondents whose families earned up to six minimum wages per month and the one composed of respondents whose families earned more than six minimum wages.

Table 1 – *Distribution of dentally anxious patients according to the MDAS and* Gatchel *Fear Scale in relation to family income.*

Family income	MDAS		Gatchel	
	Not anxious	Anxious	No modification	Afraid
Less than one MW	3	6	8	1
One to three MW	62	33	80	15
Four to six MW	71	19	76	14
Seven to 10 MW	25	10	30	5
More than 10 MW	15	3	17	1
Doesn't know	5	0	5	0
Total	181	71	216	36

MW - Minimum Wage

MDAS – Modified Dental Anxiety Scale.

Gatchel – Fear Scale

Table 2 indicates that the educational level of patients participating in this study did not present statistically significant differences ($\chi^2 > 0.05$) when groups A+B+C (illiterate + elementary school + incomplete junior high school education), D+E (complete junior high school + incomplete high school education) and F+G+H (complete high school + incomplete undergraduate + complete undergraduate education) were compared with each other, according to both MDAS and Gatchel Fear Scale scores.

Table 2 – *Distribution of patients according to level of education and relation to the MDAS and Gatchel Fear Scale.*

Level of Education	MDAS		Gatchel	
	Men	Women	Men	Women
A+B+C	7*/30**	21*/32**	9***/28****	7***/46****
D+E	7*/26**	18*/23**	1***/32****	9***/32****
F+G+H	3*/31**	15*/39**	1***/33****	9***/45****

A+B+C – illiterate + elementary school + incomplete junior high school education

D+E – complete Junior high school + incomplete high school education

F+G+H – complete high school + incomplete undergraduate school+ complete undergraduate school

*/** - anxious/not anxious

/*- afraid/no modification

Using the alfa Cronbach coefficient, the reliability of the MDAS was calculated for the conjunction of five items and found to be 0.74. The discriminant validity was determined by submitting the sample to

quartile analysis. The 95% confidence intervals did not overlap (quartile 1: 6.6786~7.3849; quartile 2: 10.5645~11.1498; quartile 3: 14.1356~14.6263; quartile 4: 18.6803~19.9228), that is, all groups presented distinct means. The ANOVA test indicated that the variation between groups was much greater than the variation within groups (F= 663.55, P=0,000).

The results obtained indicate that the two scales utilized were not entirely in agreement with each other. Spearman's correlation coefficient between the two scales was significant at the 1% level with the r value calculated in 0.58. Figure 3 presents a comparison of the two scales for patients with anxiety and/or fear.

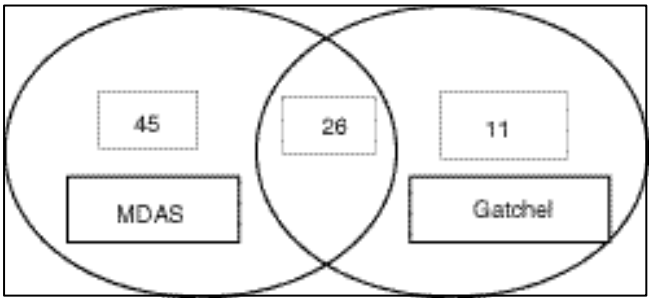

Figure 3 – Overlap between the two scales utilized for detecting patients with fear and/or anxiety.

DISCUSSION

In spite of improvements in dental equipments and procedures and methods of prevention, dental anxiety, pain and/or discomfort associated to dental treatment seem not to have changed over the years.

In this investigation, the patients were 18 years old and over, and they were interviewed while waiting to be attended in the emergency service of a dentistry school. In this setting, both individuals who were anxious due to the situation and those who had dental anxiety could be found. In a study carried out among new patients of a dental emergency clinic, Kaakko et al [10] (1999) found a 21.8% prevalence of dental anxiety. Among adults interviewed at home, prevalence of dental anxiety ranged from 7.2% to 23.4%, when using utilizing diverse instruments developed in order to measure dental anxiety.[5,8,12,13]

An analysis of the internal consistency of the MDAS was carried out in order to assess the reliability of the instrument and a 0.74 coefficient was obtained, suggesting good internal consistency of this scale. After analyzing discriminant validity, it was possible to conclude that the MDAS resulted in a measure capable of discriminating not only extreme groups but also the four quartile groups.

The two scales being assessed were not entirely in agreement with each other. In the present study, the prevalence of anxiety was 28.2%. In other studies these values varied due to differences in the basis of each scale, as well as differences in the population samples selected for each investigation. While the Gatchel Fear Scale presents more rigid limit values, the MDAS analyses both emotional and physiological responses.[12]

Also, the number of anxious patients may be greater than that found in the study. This may happen because the scales utilized do not assess the patient's reaction during dental treatment, but only his predisposition to becoming anxious in a hypothetical clinical session. For this reason, the patient's reaction during a dental visit may be different than the result obtained when applying these anxiety

scales.[9] Furthermore, patients may have difficulties in admitting their emotions. However, our study indicated that women admit their anxiety more than men do, which is consistent with the results found in other studies as well. [4,10,11,17]

Women whose scores indicated the presence of dental anxiety sought treatment more frequently than men and returned to the dentist in less than one year, which was sooner than their male counterparts. The majority of the dentally anxious patients had sought treatment within the 12 months prior to the current dental visit. In this case, the results of our study differ from those of Hakeberg et al[7] (1992), in which anxious patients resumed treatment after a period of over two years. Rosa & Ferreira[17] (1997) verified that 75.28% of the respondents classified as dentally anxious had not gone to the dentist in the past 12 months. However, in a domestic survey carried out in the metropolitan region of Sao Paulo in order to verify the reasons for non-attendance among dental patients, Cesar et al[3] (1999) observed that among 68.2% of the individuals who had not been to the dentist in the previous 12 months, only 3.25% claimed they did not do so due to “fear of the dentist”.

There were statistically significant correlations between dental fear, according to scores obtained by the Gatchel Fear Scale, and two different periods of time elapsed between the onset of symptoms and the current visit to the emergency dental service. When the group of patients who attended treatment within two days of the onset of symptoms were compared to the group who sought treatment three to seven days after the onset of symptoms, it was observed that the majority of patients who presented scores associated with dental fear sought treatment sooner. This suggests that emergency patients who present dental fear seek treatment at the onset of symptoms. This attitude may represent an attempt to solve the odontological complaint as quickly as possible, avoiding possible complications and the recrudescence of the problem.

It wasn’t possible to establish a relationship between age and anxiety in the study sample, in consonance with Doer et al[5] (1998) and Kaakko et al[10] (1999). However, some authors affirm that there is an inverse relation between these factors.[7,11,13]

Fear is a primary emotion that indicates that a dangerous situation was recognized, leading the individual to concentrate all his attention on this event. Anxiety represents a fear which was transferred from a real to an imaginary situation, resulting from similar facts or that recall a previous situation.[2] Thus 46.48% of the patients classified as anxious reported having lived a traumatic experience related to recent odontological procedures. However, Anderson[2] (1997) states that dental anxiety and fear is often a consequence of a previous traumatic story of treatment, which frequently occurs in childhood.

Educational level and family income were not associated to anxiety in this study, a result similar to that found by Hakeberg et al[7] (1992) and Rosa & Ferreira[17] (1997). However, it should be considered that the majority of patients that sought this emergency clinic were from low income families and their level of education corresponded to high school graduates or less. It would be necessary to increase the number of individuals in the sample with larger family incomes and higher levels of education in order to confirm that there was no relationship between these factors and anxiety.

Based on the fear and anxiety scales, it was verified that the results weren’t entirely in agreement, although the validity of these methods has been recognized and they may be useful to identify patients with dental anxiety or fear. In the present study, anxious women were present in greater number at the emergency dental clinic. Previous history of trauma was an important factor in the development of dental anxiety.

The fact that treatment is available free of charge makes it easier for low income patients to seek out this service. However, it should be considered that the health-disease process is multi causal, insofar

as socio-economic factors, genetic factors and those associated with family organization are among the first level of causation and may influence factors located at lower levels, such as behavioral factors, where we find the role of the dentist as well as knowledge and attitudes related to dental health, among which are anxiety and fear.[15] Therefore, other factors besides those included in this study may be further investigated so as to shed some light on the problem of dental anxiety/fear.

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