# Dental anxiety and trait anxiety: an investigation of their relationship

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### IN BRIEF

- Suggests that dental anxiety is a specific entity dissociated from trait anxiety.
- Encourages a multidisciplinary network, including cognitive behavioural approaches, for the management of dental anxiety patients.

**Background** Anxiety related to dental treatment is a fairly common phenomenon. Some studies have shown that there is an association between dental anxiety and general fears and anxiety, neuroticism and general psychological distress. **Aim** This study was designed to examine the relationship between dental anxiety and trait anxiety. **Subjects and methods** The sample consisted of 1,030 individuals (688 women; 342 men), aged  $30.8 \pm 11.7$  years. The Portuguese version of Corah's Dental Anxiety Scale (DAS) and State-Trait Anxiety Inventory (STAI-T) were used. **Results** A statistically significant association between high DAS and high STAI-T, but not between high STAI-T and high DAS, was found. The data indicated that subjects with high dental anxiety tend to present with high trait anxiety, but high trait anxiety seems not to predispose to high dental anxiety. **Conclusions** Our results indicate that dental anxiety is specific, with its own features, and its development is not necessarily associated with trait anxiety.

## INTRODUCTION

Anxiety related to dental treatment is a fairly common phenomenon in dentistry and a notable factor in the avoidance of dental care.<sup>1,2</sup> Several factors have been implicated in the aetiology of dental anxiety, including congenital determinants,<sup>3</sup> trauma<sup>4,5</sup> and negative experiences of family and friends.<sup>4-6</sup>

Some studies have shown an association between dental anxiety and general fears and anxiety, neuroticism and general psychological distress.<sup>7,8</sup> According to Klages *et al.*<sup>9</sup> dental patients with elevated anxiety are especially prone to exaggerate pain expectations when the anticipated challenge situation is

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Online article number E17 Refereed Paper – accepted 19 December 2008 DOI: 10.1038/sj.bdj.2009.253 <sup>®</sup>British Dental Journal 2009; 206: E17 perceived as fear relevant. This suggests that individuals with higher trait anxiety tend to experience more intense anxiety during dental treatment, and that they are likely to feel more pain than low trait anxiety individuals. In agreement, de Jongh *et al.*<sup>10</sup> suggested that dental fear and anxiety are associated to negative beliefs about what may transpire during dental treatment.

A recent study by Lago-Méndez *et al.*<sup>11</sup> suggests that trait anxiety may be a useful predictor of patients' predisposition to dental anxiety, although in previous studies trait anxiety was not strongly correlated to dental anxiety.<sup>12,13</sup> This study was designed to examine the relationship between dental anxiety and trait anxiety in a large sample of general population.

## METHODS

# Participants

The 1,126 individuals who were invited to take part in this study were adults (18 years or older) of both genders, native Portuguese speakers, and resident in various parts of the city of São Paulo, Brazil. All participants signed consent forms prior to participating.

#### Instruments

Dental anxiety was evaluated by the Portuguese version of Corah's Dental Anxiety Scale (DAS),<sup>14</sup> validated by Hu et al.15 The scale contains four multiple-choice items regarding the patient's subjective reactions about going to the dentist, waiting in the dentist's office for the procedure, and anticipation of drilling and scaling. Each item is scored on a 1 to 5 scale, ranging from calm (score 1) to terrified (score 5). Total scores vary from 4 to 20. According to Corah et al.,16 scores of less than 12 are considered to indicate low anxiety, 12-14 show moderate anxiety and scores greater than 14 indicate high dental anxiety.

Trait anxiety was measured by the trait form of the Portuguese version of the State-Trait Anxiety Inventory (STAI-T).<sup>17,18</sup> Trait anxiety refers to the tendency to be apprehensive and to manifest anxiety even without external stress. The questionnaire contains 20 items for which the individual rates how they generally feel. The score ranges from 20 to 80. According to a Brazilian validation study,<sup>19</sup> subjects were considered to have high or low trait anxiety if their scores were greater than 49 or less than 33, respectively.

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#### Statistical analysis

Data from the DAS and STAI-T according to their cutoffs (low, medium and high dental anxiety and trait anxiety) were cross-tabulated and tested using the McNemar-Browker test.

In addition, comparisons between genders for the two parameters were carried out using Student t-tests. Association of DAS and STAI-T mean scores and age were calculated using Pearson's correlation coefficient. Differences with p values less than 0.05 were considered statistically significant. Data were analysed using SPSS version 11.0 (SPSS Inc., Chicago, IL, USA).

## RESULTS

Sixty-two subjects refused to participate and 34 were excluded from the sample for not having answered questions appropriately. The final sample consisted of 1,030 volunteers, 688 women (66.8%) and 342 men (33.2%), aged 30.8  $\pm$  11.7 years.

The mean DAS score for the sample was 9.3  $\pm$  3.4. Women had significantly higher scores than men (9.5  $\pm$  3.5 and 8.8  $\pm$  3.2, respectively, p <0.004).

The STAI-T overall mean was 40.7  $\pm$  9.6. Women had significantly higher scores than men (42.1  $\pm$  9.7 and 38.0  $\pm$  9.0, respectively, p <0.001).

The cross-tabulation test applied to determine the association between DAS and STAI-T according to subgroups is shown in Table 1. For the low STAI-T group, 86% were in the low dental anxiety group; 19.9% of the medium STAI-T group were in the medium dental anxiety group and 16.0% of the subjects in the high trait anxiety group presented high levels of dental anxiety (p <0.001). Also, 93% of the sample was classified in the low or medium DAS group.

The correlations between DAS *vs* age and STAI-T *vs* age were weak and did not reach significance (r = 0.02, p < 0.37 for DAS; r = -0.05, p < 0.08 for STAI-T).

#### DISCUSSION

The major finding of this study was a significant association between dental anxiety and trait anxiety. However, an important consideration must be pointed out. Our data indicate that subjects with high dental anxiety tend to present high Table 1 Cross-tabulation by three categories for the Dental Anxiety Scale (DAS) and State-Trait Anxiety Inventory (STAI) trait form

STAI-T	DAS			Totol
	Low	Medium	High	TOTAL
<b>Low</b>	179*	20	9	208
% within DAS	86.1	9.6	4.3	100.0
Medium	461	125*	42	628
% within DAS	73.4	19.9	6.7	100.0
High	105	58	31*	194
% within DAS	54.1	29.9	16.0	100.0
<b>Total</b>	745	203	82	1,030
% within DAS	72.3	19.7	8.0	100.0

\*p <0.001. Subjects scoring <12 were considered low dental anxiety, 12-14 as moderate and >14 high dental anxiety. High or low trait anxiety were attributed when scores were >49 or <33, respectively.

trait anxiety, yet the opposite is not true, such that high trait anxiety individuals seem not to present a predisposition to dental anxiety. Furthermore, low and medium scores of dental anxiety are such a common feature in the general population that is not possible to use this characteristic to predict an individual's trait anxiety.

Previous studies have been controversial over this issue. Several reports which are in agreement with our findings12,20,21 have shown a weak and nonsignificant correlation between DAS and STAI-T scores. In contrast, a significant positive correlation between dental anxiety and trait anxiety has also been reported.<sup>11,22</sup> This discrepancy might be explained by methodological issues. For example, studies cited above tested small samples of patients undergoing third molar removal surgery or other dental treatment, while our data were based on a large sample involving a general population. Moreover, dental treatment seekers can be more anxious than the norm for the general population, depending on which procedures they are to undergo, and also as a result of the immediacy of the problem.

Another difference in the present study compared to previous reports is the statistical analysis. Using the McNemar-Browker test to determine the association between DAS and STAI-T has the advantage of resulting in a coefficient which is not artificially inflated.<sup>23</sup>

The present study is based on a large, randomly-selected sample from the general Brazilian population, which did not rely solely on specific groups such as university undergraduate students or patients undergoing dental treatment, which have been reported in previous studies.<sup>11,16</sup> This is the first study seeking to better illustrate the background of widely prevalent dental anxiety among the general population in Brazil.

The finding that women scored significantly higher than men on both scales is in agreement with previous studies.<sup>4,15,16,24,25</sup> Gender differences in dental anxiety might be due to the complex factors involved in men's and women's attitudes toward pain and control.<sup>26</sup> Age seems to have no significant influence on general and dental anxiety, mirroring previous studies.<sup>27,28</sup>

The general consensus in previous studies has been that dental anxiety is a multidimensional phenomenon involving many diagnostic categories and responses. The stress reaction evoked by the encounter with the dentist may be a complex mix of anxiety, fear and other factors such as coping resources, loss of self-control, and unpleasant emotions such as feelings of helplessness, insecurity, guilt and inadequacy, which appear to influence dental anxiety and result in treatment avoidance.29 However, these parameters were not explored in the present study and this might represent a limitation. In addition, other factors that may affect the perception of dental fear, such as the scope of individual dental experience, should also be taken into account in future reports.

In conclusion, our results suggest that dental anxiety is a specific entity dissociated from trait anxiety. The findings of this study are valuable in establishing effective strategies of patient management. Based on the present data, we strongly believe that subjects with high DAS scores have a high likelihood of also showing high STAI-T scores. This may lead to different planning for this type of patient, for example referral to mental health professionals. A multidisciplinary network of healthcare practitioners would design a more efficacious treatment for the patient.

Given the lack of consistent diagnostic criteria related to dental anxiety, this issue may be overlooked by dentists when patients are reluctant to openly communicate. Therapy investigations and new treatment programmes based on cognitive behavioural approaches which target negative cognition may prove of particular benefit in helping individuals to overcome this debilitating anxiety and successfully receive dental care.<sup>13</sup>

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