

## Dental Anxiety Among Patients Undergoing Various Dental Treatments in a Nigerian Teaching Hospital

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### Abstract

The aim of the present study is to evaluate the levels of dental anxiety among patients undergoing various dental treatments and to compare the anxiety levels with those of similar studies conducted with subjects from different socio-cultural backgrounds. Dental anxiety was evaluated by the administration of a questionnaire based on the Corah's Dental Anxiety Scale (DAS). Student t-test and analysis of variance (ANOVA) with Bonferoni correction was employed to compare the mean DAS scores. Females recorded higher total DAS scores than males ( $7.49 \pm 2.96$  and  $7.16 \pm 3.44$ , respectively). Patients in the 24-34 year age group showed the highest total DAS scores ( $8.25 \pm 3.20$ ) followed by the <24 year age group. The total DAS scores for age groups 35-39 and >50 years differ significantly from those of age groups <24 and 24-34 years. The highest DAS score was recorded for root canal therapy ( $9.30 \pm 2.84$ ) followed by extraction. The level of dental anxiety among this study population is lower than those reported elsewhere. The observed avoidance of dental treatment among Nigerians, despite the seemingly low mean DAS scores, may be related to dental anxiety. The authors are, however, of the opinion poor dental awareness may be a contributory factor.

**Keywords:** Dental anxiety, fear, pain, dental treatments

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## Introduction

Dental fear denotes a response to a real or active threat. It is usually brief, the danger is external, the stimulus is readily identified, and the unpleasant physiologic body feelings that are associated with this emotion pass as the danger passes.<sup>1</sup> Anxiety is a subjective state of feelings. It may be defined as a state of unpleasant feelings combined with an associated feeling of impending doom or danger from within rather than from without. Unlike fear, anxiety and its associated symptoms are most often anticipatory in nature; that is, they are often felt when a stimulus is not present or readily identifiable.<sup>2</sup> Other symptoms of anxiety are the same as those of fear; therefore, for the purpose of this study, dental fear and anxiety will be used synonymously.

Dental anxiety is an important, if not the major, component of distress to patients in the dental operatory.<sup>3</sup> Despite the technological advances in modern dentistry, anxiety about dental treatment and fear of pain associated with dentistry remain widespread. Epidemiological studies suggest between 3% and 20% of the population have levels of fear and anxiety about dental treatment that is considered to be problematic.<sup>4</sup> Anxiety and the fear of pain keep patients from seeking dental care. If they manage to actually seek care, they often become difficult to manage once they are in the dental chair. Dental fear is thought to be a factor in broken and cancelled appointments. Avoidance of dental treatment due to anxiety is very common and may be strongly associated with deterioration of oral and dental health.<sup>5</sup> This condition is well reported in the Western world. In a survey of the general population in the United States approximately 15.5% of the respondents surveyed had some degree of dental fear and were dental avoiders.<sup>5</sup> Also, one in eight older people in Britain are dentally anxious and this is associated with their use of services and oral health status.<sup>6</sup>

Dental anxiety varies in intensity from patient to patient. At one end of the continuum there are patients who experience no anxiety, while at the other end are the extremely anxious patients. The prevalence of dental anxiety (DAS score > 13) among Australians was reported to be 14.9%,<sup>7</sup> while those of a young adult population in Canada<sup>8</sup> and adolescents in Russia<sup>9</sup> was 12.5% and 12.6%, respectively. About

4-7% of subjects in Japan, Indonesia, Brazil, and Argentina reported having extreme dental fear.<sup>10</sup> Studies conducted in various countries worldwide have determined females have higher anxiety levels than males.<sup>11,12</sup> However, in Indonesia and Argentina men reported higher fear.<sup>10</sup> Dental anxiety may arise during adulthood; younger adults being particularly vulnerable. The incidence of dental anxiety was reported to vary from 12.2% in those aged 18-24 years to 1.7% among those aged 65 years and over.<sup>13</sup> While a study on the onset and patterns of change in dental anxiety reported an increase in prevalence of dental anxiety from 10.6% at age 15 years to 13.3% at 18 years and 21.1% at 26 years<sup>14</sup>, it is generally believed dental anxiety is less prevalent among older adults than in younger populations.<sup>15</sup> It has also been widely reported anxiety tends to decrease with age; reasons suggested include differences in historical and cultural background and experiences between the age groups, which can be due to the ageing process itself characterized by a general decline in anxiety.<sup>15</sup>

Specific procedures or steps in dental treatment tend to particularly arouse anxiety. Some of the highly ranked sources of anxiety were technical procedures such as extractions, cavity preparation, or holding the syringe and needle in front of the patient. Extraction and root canal treatment were found most frightening by Wong and Lytle<sup>16</sup>, while a dental school based study<sup>17</sup> reported periodontal treatment to be the most anxiety provoking procedure, followed by root canal therapy, oral surgery, and orthodontic treatment.

Data availability regarding anxiety associated with various dental treatments and variations in different populations is scanty. If dentists are aware of the level of anxiety of their patients, they can anticipate the patient's behavior and be better prepared to take measures to help alleviate the anxiety. It is, therefore, the purpose of the present study to evaluate the levels of dental anxiety among patients undergoing various dental treatments at the Dental Hospital of the Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife, Nigeria, and to compare anxiety levels with those of similar studies carried out among people of different socio-cultural backgrounds.

## Methods and Materials

### Patient Selection

The study was carried out among patients referred from the Oral Diagnosis Unit to the Departments of Restorative Dentistry, Oral Surgery, and the Periodontology Unit of the Dental Hospital Obafemi Awolowo University, Ile-Ife, Nigeria. The first 40 patients appointed for treatment provided by the various clinical departments or unit during the month of October and November 2002 were included in the study, and their levels of anxiety were assessed. Anxiety prior to the following procedures was evaluated: filling, root canal therapy, extraction, and scaling and polishing.

### The Questionnaire

Each patient was administered a questionnaire based on the Corah's Dental Anxiety Scale (DAS).<sup>18</sup> DAS has been tested in many situations and demonstrates very good validity and reliability (Figure 1). The scale contains four multiple choice items dealing with the patient's subjective reaction to the dental situation:

- Anticipating visit to the dental clinic
- Waiting in the dentist's office for treatment
- Waiting in the dental chair for drilling of teeth
- Waiting in the dental chair for scaling the teeth

Five possible answers that are in an ascending order, from 1 to 5, are provided; each carries a possible maximum score of 5, with a total possible maximum score of 20 for the entire scale.

### Statistical Analysis

The Student t-test was used to compare the mean DAS scores of both females and males. Analysis of variance (ANOVA) with Bonferoni correction was employed to compare the mean DAS scores prior to each dental procedure (root canal therapy, scaling and polishing, extraction, and filling) and also to compare the mean DAS scores for age groupings. Dentally anxious individuals were defined as those with a DAS score of 13 or more.

## Results

The means and standard deviation (SD) of the dental anxiety scale for the total study population by gender are shown in Table 1. Females recorded higher total DAS scores than males ( $7.49 \pm 2.96$  and  $7.16 \pm 3.44$ , respectively). Also, for each question separately, females had higher scores than males except for question two. The differences are not statistically significant.

Table 2 shows the means and SD of DAS scores in relation to the various treatments. The highest DAS scores were recorded for root canal therapy ( $9.30 \pm 2.84$ ) followed by extraction, filling and scaling in descending order. The highest and lowest DAS means were not significantly different. The total DAS scores as well as for each question separately for scaling differ significantly from those for other treatments.

The DAS means and SD by age of the study population are shown in Table 3. Patients in the 24-34 year age group showed the highest total DAS scores ( $8.25 \pm 3.20$ ) followed by <24, 35-49, and >50 year age groups in descending order. The total DAS scores for age groups 35-39 and >50 years differ significantly from those of age groups <24 and 24-34 years, but the 24-34 year and <24 year age groups did not differ significantly from each other.

## Discussion

Medical and psychological research on human responses to pain stimuli has generally found that women report higher levels of anxiety (they have lower thresholds) and exhibit less tolerance for pain at given stimulus intensities than men.<sup>19</sup> The results of the present study showed that women patients had higher DAS scores and, therefore, are more likely to demonstrate higher levels of dental anxiety than men (7.49 and 7.16, respectively). It may also be that women are more likely to self-report, whereas men may not express their fears as openly as women. This difference is rather on the low side when compared with that of Stabholz and Peretz<sup>20</sup> in Jerusalem who reported 10.1 and 8.3 DAS scores for women and men, respectively. However, these differences were not statistically significant and, hence, are in agreement with the findings of other studies.<sup>11, 12</sup>

### Questionnaire

(Please circle the answer that matches your feelings about each question.)

1. If you had to go to the dentist tomorrow, how would you feel about it?
  - a) I would look forward to it as a reasonably enjoyable experience.
  - b) I wouldn't care one way or the other.
  - c) I would be little uneasy about it.
  - d) I would be afraid that it would be unpleasant and painful.
  - e) I would be very frightened of what the dentist might do.
2. When you are waiting in the dentist's office for your turn in the chair, how do you feel?
  - a) Relaxed.
  - b) A little uneasy.
  - c) Tense.
  - d) Anxious.
  - e) So anxious that I sometimes break out in a sweat or almost feel physically sick.
3. When you are in the dentist's chair waiting while he gets his drill ready to begin working on your teeth, how do you feel?
  - a) Relaxed.
  - b) A little uneasy.
  - c) Tense.
  - d) Anxious.
  - e) So anxious that I sometimes break out in a sweat or almost feel physically sick.
4. You are in the dentist's chair to have your teeth cleaned. While you are waiting and the dentist is getting out the instruments which he will use to scrape your teeth around the gums, how do you feel?
  - a) Relaxed.
  - b) A little uneasy.
  - c) Tense.
  - d) Anxious.
  - e) So anxious that I sometimes break out in a sweat or almost feel physically sick.

**Figure 1.** Questionnaire based on Corah's Dental Anxiety Scale (DAS). Points were assigned for the subjects choices, with one point for an (a) choice to 5 points for an (e) choice.

Table 1. Means and standard deviation of DAS scores by gender.

DAS item	Female (N=83)	Male (N=77)	Sig.*
Anticipating at home	2.27 ± 1.12	2.06 ± 1.10	NS
Waiting in dental office	1.72 ± 0.93	1.74 ± 1.01	NS
Waiting for drill	1.76 ± 0.77	1.74 ± 0.99	0.048
Waiting for scaling	1.73 ± 0.78	1.64 ± 0.86	NS
Total	7.49 ± 2.96	7.16 ± 3.44	NS

\*Student t-test.

Table 2. Means and standard deviation of DAS scores by type of treatment.

DAS item	Root Canal	Scaling	Extraction	Filling	Sig.*
Anticipation	2.70 ± 0.94	1.27 ± 0.45	2.53 ± 1.18	2.17 ± 1.15	0.0001
Waiting	2.17 ± 0.98	1.02 ± 0.16	2.00 ± 1.06	1.73 ± 1.06	0.0001
Drill	2.30 ± 1.02	1.02 ± 0.16	1.93 ± 0.89	1.75 ± 0.67	0.0001
Scaling	2.15 ± 0.80	1.02 ± 0.16	1.93 ± 0.86	1.65 ± 0.77	0.0001
Total	9.30 ± 2.84	4.35 ± 0.74	8.38 ± 3.18	7.30 ± 2.95	0.0001

\*ANOVA with Bonferoni correction.

Table 3. Means and standard deviation of DAS scores by age.

DAS item	<24 yrs (N=49)	24-34yrs(N=56)	35-49yrs(N=23)	>50yrs(N=32)	Sig.*
Anticipation	2.39 ± 1.15	2.36 ± 1.23	2.13 ± 0.92	1.53 ± 0.67	0.002
Waiting	1.84 ± 0.97	2.02 ± 1.15	1.57 ± 0.95	1.19 ± 0.40	0.001
Drill	1.90 ± 1.00	1.95 ± 0.82	1.61 ± 0.89	1.28 ± 0.63	0.003
Scaling	1.73 ± 0.79	1.91 ± 0.84	1.61 ± 0.89	1.28 ± 0.63	0.005
Total	7.82 ± 3.24	8.25 ± 3.20	6.91 ± 3.22	5.28 ± 2.07	0.000

\*ANOVA with Bonferoni correction.

A consistent finding in this area of study is an inverse relationship between dental fear/anxiety and age.<sup>21</sup> Liddell and Locker examined the relationships of gender and age on anxiety in a Canadian population and found older adults reported less painful experiences with dental procedures than younger participants.<sup>22</sup> The patients aged 24-34 years recorded the highest DAS scores, while patients in the oldest age group showed the lowest DAS scores. These findings agree with previous studies.<sup>20</sup>

When considering dental anxiety in relation to the various types of treatment, anxiety prior to root canal therapy was found to be the highest (9.30 ± 2.84 DAS) followed by extraction (8.38 ± 3.18) and filling (7.30 ± 2.95). The finding of root canal therapy being the most anxiety-provoking procedure is in agreement with Wong and Lytle<sup>16</sup> and



in contrast to Weinstein et al.<sup>17</sup> Anxiety prior to scaling was found to be the lowest ( $4.35 \pm 0.74$ ). This contradicts Stabholz and Peretz<sup>20</sup> who rated scaling as the second anxiety provoking procedure. This may be explained by the difference in age of patients in the two study groups. In this study more than 50% of the patients are younger than 34 years of age. Patients in this age group are more likely to benefit from the treatment of caries and its sequelae (filling and root canal therapy), whereas in the study of Stabholz and Peretz<sup>20</sup> more than 50% of the patients were older than 34 years of age and are more likely to manifest some degree of periodontal disease and might require meticulous scaling and root planning, which is considered more painful especially when the roots are exposed.

Generally, the patients in the present study recorded lower DAS scores (mean DAS score  $\pm$  SD,  $7.33 \pm 3.20$ ) than most previous studies;  $9.04 \pm 3.45$  among Australians<sup>7</sup> and an average DAS score of 10.0 in Russians.<sup>9</sup> About 92.5% were classified not anxious (DAS score  $\leq 12$ ), indicating a low anxiety state among the study

population. This finding is supported by the result of a study in an outpatient dental emergency clinic, which reported differences in DAS scores of Black, White, and Puerto Rican patients; Puerto Ricans scored highest, Blacks lowest, and Whites in-between.<sup>23</sup> Surveys indicated about 15.5% of the American adult population avoid dental treatment because of some degree of dental fears.<sup>5</sup> In addition it has been estimated a much larger percentage of the population, up to 25%, avoids dental treatment except when they are symptomatic.<sup>24</sup> Cohen et al. found that having symptoms as the reason for the last dental visit is significantly related to dental anxiety.<sup>25</sup>

### Conclusion

In Nigeria it has also been observed that a large percentage of the population avoids dental treatment except when their condition is accompanied with severe pain. In light of the findings by Cohen et al.<sup>25</sup> the observed avoidance of dental treatment among Nigerians, despite the seemingly low mean DAS scores, may be related to dental anxiety. The authors are, however, of the opinion that poor dental awareness may be a contributory factor.

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