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# TRAIT ANXIETY, SEX, AGE AND DENTAL TREATMENT EXPERIENCE AS DETERMINANTS OF DENTAL ANXIETY AMONG CHRONIC DENTAL PATIENTS IN NIGERIA

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**Abstract**

**Objectives -** To investigate the influence of trait anxiety, sex, age and previous dental treatment experience on dental anxiety.

**Design** - The study utilised a cross-sectional survey design. Independent variables are trait anxiety, sex, age and dental treatment experience. Dependent variable is dental anxiety.

**Setting -** The dental centre of a teaching hospital in Nigeria.

**Participants -** Data were collected from 255 (115 male and 140 female) respondents selected through purposive sampling technique. The mean age was 28.59 years (SD=10.74 years).

**Results:** This study revealed that respondents with high trait anxiety levels reported significantly higher dental anxiety ($t(253) = -5.78$, $p < .01$) than those with low trait anxiety. Male respondents reported significantly lower dental anxiety ($t(253) = -3.04$, $p < .05$) than the females.

**Conclusion:** Trait anxiety dispositions and sex are important predictors of dental anxiety and should be taken seriously in the management of dental anxiety at the various secondary care dental centres.

**Keywords:** Dental anxiety, trait anxiety, sex, age, dental treatment experience

## Introduction

Dental anxiety is a universal human phenomenon (Folayan, Idehen & Ojo, 2004). Studies have shown a worldwide variation in the prevalence of dental anxiety, with estimates ranging between 3% and 43%. The aetiology of dental anxiety is multifactorial, with factors acting in synergy to affect its expression. Lalabonova, Staneva, and Dobreva define dental anxiety as the

feeling of tension associated with dental treatment and is not necessarily connected to external stimuli. When the patient anticipates a dental intervention, his mind and memory start spontaneously to generate thoughts, images, and memories obsessing his personality. The patient realizes their unsubstantiated character, treats them critically but is unable to get rid of them (Lalabonova, Staneva & Dobreva, 2005). The vegetable symptoms also become more intense (heart palpitation, facial flushing, and headache). All these can result in a definitive refusal to undergo dental treatment.

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. It has been estimated that up to 25% of Nigerian population avoids dental treatment except when they are symptomatic(Udoye, Oginni & Oginni,2005).

The fear of dental treatment continues to be an issue within dentistry to the extent that about 31% of adults express this feeling. The attendant anxiety and fear of dental treatment prevent sufferers from seeking dental care (Udoye et al, 2005 and McGoldrick, de Jongh & Durham, 2001). When such individuals manage to actually seek care, they often become difficult to manage once they are in the dental chair. There have been some occasions when anxious patients in the dentist's office reported experiences of pain, and ineffective local anaesthesia (Fiset, Milgrom, Weinstein & Melnick, 1989 and Vassend, 1996). Other patients have reported other sources of fear, such as fear of specific treatments (for example drilling, extractions and root canal treatments) or instruments (such as syringe and explorer), and a feeling of lack of control or distrust and fear of belittlement by dental personnel (Milgrom, Weinstein & Getz, 1995). These problems make the treatment of fearful dental patients to be stressful, challenging and problematic for the dental care team.

Reports about the relationship between general and specific anxiety and fear among dental-phobic individuals are contradictory (Abrahamsson, Berggren & Carlsson, 2000). While previous research has indicated that fearful dental patients do not differ in level of general fear from non-fearful dental patients (Berggren & Carlsson, 1984), most authors report the opposite (Berggren, 1992). In Berggren's study (1992), it is shown that 93% of dental-phobic individuals reported at least one additional extreme fear besides dental phobia and that 50% of the patients reported 5 or more severe fears. These results indicate that dental anxiety might represent not just a specific fear reaction, but also a condition where dental anxiety is one among several fears in more complex anxiety syndrome. On the contrary, Fuentes, Gorenstein, and Hu indicate that dental anxiety is specific, with its own features, and its development is not necessarily associated with trait anxiety (Fuentes, Gorenstein & Hu, 2009).

McNeil, Weaver, Graves, Kyle & Davis (2011) in a study, found those participants who were high in trait dental anxiety exaggerated their recall of anxiety with highly anxious patients reporting more pain prior to the procedure and expecting more pain; ratings of anxiety and pain for all participants assimilated over time. Likewise, Lago-Méndez et al. suggest that trait anxiety may be a useful predictor of a patient's predisposition to dental anxiety (Lago-Méndez *et al*, 2006). In line with these, Crofts-Barnes et. al. concluded that dentally phobic patients, in the pre-operative period, have greater dental and general anxiety and a poorer quality of life, compared with non-phobic dental patients (Crofts-Barnes, Brough, Wilson, Beddis & Girdler, 2010).

More studies aimed at examining sex differences in relation to dental anxiety have been done in recent years, as practitioners and researchers seek effective, individualized management strategies to meet the needs of diverse patient populations (Gadbury-Amyot & William, 2000). One consistent finding in this area of study is female reporting dental fear and anxiety more frequently than male (Holtzman, Berg, Mann & Berkey, 1997).

Malvania and Ajithkrishnan studied the prevalence and socio-demographic correlates of dental anxiety among a group of adult patients found females to be significantly more anxious than their male counterparts (Malvania & Ajithkrishnan, 2011). But the examination of predictors of fear/anxiety showed that painful experiences were ranked as greater in importance for men than women and that tolerance of pain was a significant predictor of dental anxiety for men alone (Gadbury-Amyot & William, 2000). Loss of control has been identified in several studies as another significant predictor of fear. Liddell and Locker assert that perceived lack of control was the second largest predictor of dental fear and anxiety in their study respondents (Liddell & Locker, 1997). However, women demonstrated significantly greater desire for control than men. Gabdury-Amyot and William (2000) conclude that women appear to be at a greater disadvantage than men in their perceived ability to cope in a dental situation because of their greater desire for control, coupled with a lower perception of actual control. They suggest that this situation creates a psychological tension in women, resulting in greater fear and anxiety.

Similar results were found by Gabdury-Amyot and Williams (2000) when they examined patient fear and anxiety related to dental hygiene treatment. Females reported significantly higher than males. Holtzman et al.( 1997) found that female reported a significantly higher degree of fear in response to dental care in the area of specific stimuli (feel of needle, feel of drill) and feelings attributed to generalized anxiety (approaching the office).

Studies aimed at examining age differences in relation to dental anxiety have been done in recent years, as practitioners and researchers seek

effective, individualized management strategies to meet the needs of diverse patient populations (Gadbury-Amyot & William, 2000). One consistent finding in this area of study is an inverse relationship existing between dental anxiety and age (Holtzman et al., 1997). There was no statistical difference between age categories in relation to total dental hygiene fear scores or any significant differences within the four sub-scales. Anxiety levels for the age groups when compared for dental anxiety did not reveal statistically significant difference (Malvania & Ajithkrishnan, 2011). Almost similar results have been reported by Udoye et al.(2005). These findings support the concept that patients, irrespective of their age categories respond similarly when seeking either dental treatment. However, age was found to have influenced anxiety associated with dental care and that adult aged between 40 and 64 years had the highest dental anxiety levels (Armfield, Spencer & Stewart, 2006).

An early negative dental experience is probably the most stated single cause of dental anxiety (Locker, Liddell, Dempster & Shapiro, 1999). However, a negative dental experience does not necessarily lead to dental anxiety. The 'latent inhibition' theory, for instance, states that a history of positive or neutral dental experience may serve as a buffer against the development of traumatic associations or experiences (Davey, 1989). As a consequence, high level of anxiety or fear is developed less easily. Conversely, an early negative dental experience can serve as a one - shot conditioner and may leave a patient with feelings of anxiety. It has been indicated that early experience of painful treatment might be the cause for heightened anxiety, but according to Klepac, Dowling, and Hauge, early painful experience was remembered by those with low levels of anxiety as well as those with high levels of anxiety Klepac, Dowling & Hauge, 1982). They feel that the distorted cognitive responses to distortion can cause confounding avoidance and neglect, which can become a cycle. Dental anxiety is deeply rooted in people (Hakeberg, 1992).

Much has been done in clinical and non-clinical settings to investigate dental anxiety and pain perception all over the world and even in Nigeria, most especially with regard to such factors as sex and age differences. However, it remains unclear in this environment how trait anxiety, sex, age and previous dental treatment experience can contribute to dental anxiety among people experiencing oral pain conditions. From the foregoing therefore, a research into the problem of dental anxiety becomes very necessary. Thus, determining the roles and effects of trait anxiety responses, sex, age and dental treatment experience is the focus of this study.

Therefore, the following hypotheses are tested.

1. Respondents who scored high on trait anxiety will report significantly higher dental anxiety than respondents who scored low on trait anxiety
2. Male respondents will report significantly lower dental anxiety than female respondents.
3. Young respondents will score significantly higher on dental anxiety than those who are older.
4. Respondents who have had previous dental treatment experience will report significantly higher dental anxiety than those who have not had previous dental treatment experience.

**Methodology**

This study is a cross-sectional survey design, with dental anxiety as dependent variable and trait anxiety, sex, and age as major independent variables. A total of 320 respondents experiencing oral pain conditions were selected through purposive sampling technique. Out of these, only 255 respondents actually successfully completed and filled the questionnaire given to them.

**Research Instruments**

The instrument that was used in this study is a questionnaire which is subdivided into three sections.

*Section One:* Social demographic variables captured information, such as age, sex, marital status, diagnosis, duration of illness, employment status, educational status, and so on.

*Section Two*: Dental Anxiety Scale (DAS): This is a four-item measure developed by Corah (Corah, 1969). Respondents were asked about four dental-related situations and were asked to indicate which of four responses (of increasing severity) is closest to their likely response to that situation. The scale yields a score of 4 to 20, with high scores indicating greater anxiety (Corah, Gale & Illig, 1978). A score greater than 15 is indicative of phobic level of anxiety. Corah et al. (1978) found that the internal consistency and test-retest reliability of the scale were greater than 80. Corah's DAS has been modified by the addition of a fifth item that asks about responses administration of local anaesthetic and by a change in the response format (Humphris, Morrison & Lindsay, 1995). A reliability greater than 80 and validity r = 80 was reported for the modified version (Schuurs & Hoogstraten, 1993). Modified DAS was used for this study and it generated an alpha coefficient of .76 and a Spearman Brown equal length coefficient of .75.

*Section Three:* Spielberger's State-Trait Anxiety Inventory (STAI-T) was used to measure trait anxiety. This is a 20-items inventory developed by

Spielberger, Gorsuch, and Lushene (1983). It assesses individuals' predisposition to judge situations as dangerous or threatening and to respond with increased levels of state anxiety. Items are scored on four-point scales, with response categories varying according to the nature of the questions. Spielberger et al. (1983) aver that the questionnaire has been tested extensively for reliability and validity. A test-retest reliability of 0.86 has been reported (Omoluabi , 1987). In the present study, a coefficient alpha of .84 and Spearman Brown split half of .84 was obtained. Higher score indicate high trait anxiety while lower score indicate low trait anxiety.

**Procedure**

Respondents in this study were recruited from people living with oral pain conditions and attending the Dental Centre, UBTH, Benin City after obtaining due approval from the Ethics and Research Committee of the hospital. A diagnosis of oral pain condition was made by the attending dental surgeon following a clinical dental examination and radiography of the affected part of the mouth. It was after the x-ray examination that the clients were told about an on-going research. Clients who chose to participate in the study were brought by the dental surgeon to a waiting room nearby where the primary investigators were waiting to receive them. Those who did not wish to participate in the study were not to meet the primary investigators. As usual, they were taken to the treatment rooms usually for an extraction or root canal therapy. Radiography of the affected pain site in the mouth usually takes about 10 minutes. The main reasons given for not wishing to participate in the study were mainly the excruciating pain they were undergoing, and inability to read and understand the test items that was written in English. It was observed that more males than females and older people than younger people did not give their consent to participate in the study given the two reasons stated above. Respondents read and signed the consent form as they arrived at the Psychological Assessment Room. Typically, it took most respondents less than 12 minutes to complete all the scales. As a token of appreciation for participation, respondents who successfully completed the form were offered a free ball pen. After the assessment, the respondents were escorted by a dental nurse to the appropriate treatment room either for extraction or root canal fillings.

**Statistical analysis**

Responses to the questionnaires were coded and entered into the Statistical Package for Social Sciences (SPSS, version 15.0). Apart from descriptive statistics, the analyses included reliability assessment of the independent and dependent scales (Cronbach alpha and split–half method)

and t-test for independence sample, to establish the effects of trait anxiety, sex, age, and previous dental treatment experience on the dependent variable.

**Results**

Of the final total sample of 255 respondents, 115 (45.1%) were male, and 140 (54.9%) were female. The mean age was 28.59 years (S.D = 10.74), ranging from 18 to 75 years. A total of 190 (74.5%) respondents were single, 60 (23.5%) were married, 2 (0.8%) were divorced, 2 (0.8%) were living with partner and 1 (0.4%) was separated from the spouse. Mean dental pain duration for the respondents was 13.86 months (SD = 25.10 months) and they reported an average perceived pain of 36.29 (SD =19.01). Forty–one (16.1%) respondents had their oral pain originating in the periodontal and 125 (49%) respondents had their pain originating in the tooth. 122 (47.8%) respondents have had previous dental treatment, while 133 (52.2%) have not had previous dental treatment. Among the respondents, 41 (16%) were employed on a full-time basis, 33 (12.9%) were self-employed, 160 (62.7%) were students, 12 (4.7%) were working on a part-time basis, 6 (2.4%) were retired, and 3 (1.2%) were home makers. In terms of educational attainment, 128 (50.2%) were high school graduates while 127 (49.8%) had tertiary education.

The responses of the respondents were subjected to a t–test for independent sample with trait anxiety, sex, age and previous dental treatment experience as independent variable and dental anxiety as the dependent variable. Results of the analysis are presented in Table 1 below.

The results obtained show that trait anxiety significantly influenced dental anxiety t (253) = -5.78, p <.01. As predicted, respondents who scored high on trait anxiety reported significantly higher dental anxiety ($\bar{x}$ =15.75) than respondents who scored low on trait anxiety on dental anxiety ($\bar{x}$ = 12.71). Furthermore, sex contributed significantly to dental anxiety. The hypothesis was tested using t-test for independent samples.

The result reveals a significant influence of sex on dental anxiety, t (253) = -3.04, p < .05. As predicted, those respondents who were males reported significantly lower dental anxiety ($\bar{x}$ = 13.32) than their female counterparts ($\bar{x}$ =15.01). Moreover, the influence of age of respondent on dental anxiety was further examined in this study using t–test for independent sample. The age of respondents who were experiencing oral pain conditions did not significantly influenced dental anxiety t (253) = -1.20, p ns. Contrary to the prediction, respondents who were older (Age ≥ 28 years) did not score significantly less on dental anxiety ($\bar{x}$ = 14.70) than their younger (Age ≤ 28 years) counterparts ($\bar{x}$ = 14.00). Similarly, the result of the last hypothesis, using t-test for independent sample reveals no significant

influence of previous dental treatment experience on dental anxiety, t (253) = -.96, p ns.

**Table 1: Summary of Table of Independent T-Test Results Showing the Significant Influence of Trait Anxiety, Sex and Age on Dental Anxiety**

| Dependent Variables | Groups | Levels | N | $\bar{X}$ | S.D | T | D.F | P |
|---|---|---|---|---|---|---|---|---|
| | Trait | Low | 126 | 12.71 | 3.93 | -5.78 | | 253 |
| | Anxiety | High | 129 | 15.75 | 4.48 | | .05 | |
| Dental | Sex | Male | 115 | 15.01 | 17.76 | -2.27 | | 253 |
| Anxiety | | Female | 140 | 33.34 | 19.72 | | .05 | |
| | Age | Old | 90 | 14.70 | 4.60 | -1.20 | | 253 |
| | | Young | 165 | 14.00 | 4.40 | | NS | |
| | Dental | Previous | 122 | 13.97 | 4.52 | -.96 | | 253 |
| | Treatment | Treatment | | | | | NS | |
| | | No Previous Treatment | 133 | 14.50 | 4.43 | | | |

## Discussion

The major purpose of this study is to contribute to the challenge of ensuring an enhanced quality of life for people experiencing oral pain conditions given the problem of dental anxiety that is still associated with modern dentistry. Based on the results of data analysis, it was revealed that trait anxiety and sex of respondents significantly influenced dental anxiety. These findings suggest that trait anxiety and sex of respondents are significant in explaining dental anxiety among people who were experiencing chronic dental pain.

Several studies have investigated the relationships between trait anxiety and dental anxiety and found conflicting results. A significant positive correlation was reported between trait anxiety and dental anxiety in a study conducted by Hakeberg (2001). Similarly, it has been confirmed that dental anxiety is associated with general anxiety but not with depression (Viinikangas, Lahti, Joukamaa, Freeman & Humphris, 2008). Pohjola, Mattila, Joukamaa, and Lahti‘s (2011) findings also support the result in this study in which participants with high dental fear more commonly reported anxiety disorders than did participants with lower dental fear. This finding suggests that although general trait and dental anxiety are different phenomena, there was a relationship between them.

The findings also revealed a significant influence sex on dental anxiety. Respondents living with oral pain conditions who were males reported significantly lower dental anxiety than respondents who were females. Similar results were found by Gabdury-Amyot and Williams (2000) when they examined fear and anxiety related to dental hygiene treatment

among patients. This finding is also consistent with other studies which have shown that women express more fears than men (Malvania & Ajithkrishnan, 2011). Besides, Akarsian et al. found that females had both higher trait and dental anxiety levels than males (Akarsian, Erten, Uzun, Iseri & Topuz, 2010). Fabian (2007) reported that girls had higher dental anxiety and trait anxiety. In a similar vein, Daini (2005) claimed that adolescents' girls were more anxious than boys. This may be due to real differences in anxiety levels between the sexes, a greater readiness among female to acknowledge feelings of anxiety, or a combination of both (Thomson, Stewart, Carter & Spencer, 1996). The present data implies that sex should be taken seriously in dental anxiety management.

There was no significant influence of age on dental anxiety in this study. This is contrary to the consistent finding in this area of study of an inverse relationship existing between dental anxiety and age (Holtzman et al., 1997). The findings are in line with the assertion of Gadbury-Amyot and Williams (2000) who found no statistical difference between age categories in relation to total dental hygiene fear scores or any significant differences within the four sub-scales. Furthermore, Malvania and Ajithkrishnan (2011) claim that the anxiety levels for the age groups when compared to dental anxiety did not reveal statistically significant difference. Almost similar results have been reported among the Nigerian population (Udoye et al., 2005). These findings support the concept that patients, irrespective of their age categories respond similarly when seeking either dental treatment. However, Armfield, Spencer, and Steward (2006) found age to have influenced anxiety associated with dental care and that adult aged between 40 and 64 years had the highest dental anxiety levels.

It was observed in this study that previous dental treatment experience did not significantly influenced dental anxiety. The hypothesized relationship was informed by the avoidance conditioning model (Mowrer 1947). Nevertheless, the result of this study did not show any significant difference between respondents with oral pain conditions who have had dental treatment experience in the past and those who have not. This implies that their level of dental anxiety may be the same, irrespective of whether dental treatment experiences had taken place in the past or not. This research also demonstrates the possibility that not all fears and phobias can be acquired by this means. Thus, the avoidance conditioning model cannot account for the acquisition of all phobias (Davison & Neal, 1996).

## Conclusion

This study has revealed that trait anxiety and sex are pertinent to dental anxiety in this environment. The current study helped to determine what factors need to be targeted in order to reduce dental anxiety. The

implication of these findings is that, if general dental practitioners, clinical psychologists and psychiatrists functioning at various secondary care dental centres do not consider the psychosocial functioning of each individual when managing them, attempts to reduce the incidence of dental anxiety may be endangered. This study shows that respondents who are females and respondents with high trait anxiety are likely to manifest dental anxiety. These findings imply that trait anxiety responses and sex should be taken seriously in the management of dental anxiety. Therefore, health-care professionals involved in the dental treatment procedure should look out for possible manifestation of psychosocial disability associated with dental anxiety among people with high trait anxiety and the females. The moment a psychosocial problem is identified, an effective intervention can be commenced to prevent or reverse any psychosocial disability. The general dental practitioner can make a referral to the mental health team at the secondary care dental centre, where appropriate treatment to alleviate identified psychosocial disability will be applied.

Specifically, the findings from this study on the association between trait anxiety and dental anxiety have profound implications for the management of disability associated with people experiencing oral pain conditions. The dentists need to be aware of the possibility that patients having dental anxiety could also have constitutional vulnerability to generalized anxiety which remains stable over time. Akarsian et al.(2010) reported that approximately 22% of the patients attending their dental clinic had high level of both dental anxiety and trait anxiety. As the chances of encountering these patients in a clinic are fairly high, general dental practitioners, psychiatrists and clinical psychologists in the secondary care dental hospitals should be aware of the possible problems associated with anxiety and what these patients feel about dental treatment procedures. Thus, clients that have been identified as having high levels of dental anxiety might benefit from being evaluated for other significant psychological symptoms. If other symptoms are present, clients' dental anxiety might be indirectly treated by targeting other symptoms. The current study did not assess factors that dentists consider in deciding if or when to refer a patient for psychological treatment of anxiety. Future research can help explore dentists' referral process and how to improve the process if necessary.

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