Dental Anxiety in a Sample of West Indian Adults

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ABSTRACT

Aim: *The aim of this study was to investigate the level of dental anxiety and its possible causes among people in Trinidad and Tobago.*

Method: *This is a cross-sectional survey of parents and guardians accompanying children who were attending a paediatric dental clinic. Participants completed a questionnaire while in the waiting room, which included the Modified Dental Anxiety Scale (MDAS), age, gender and occupation. An additional item was included which asked participants to rate the anxiety felt on having a tooth extracted.*

Results: *There were 100 participants (81% female). Overall, 40% of participants reported moderate to severe anxiety. Twenty-three per cent of participants had moderate anxiety (MDAS 15–18) and 17% had severe anxiety/phobia (MDAS 19–20). Level of anxiety was related to gender (multiple linear regression,* $p < 0.05$*). Proportions of participants were very/extremely anxious of having a tooth drilled (48%), local anaesthetic injection (53%) and extraction (52%). Thirty-six per cent of participants had avoided dental treatment in the past because they were too anxious.*

Conclusion: *High levels of dental anxiety were found in this sample of Trinidadian adults. The MDAS was able to detect significant elements of that anxiety. The addition of a question on extraction revealed that this procedure may contribute substantially in anxiety toward dental treatment in the Caribbean.*

Keywords: Caribbean, dental anxiety, dental care, phobia

Ansiedad Dental en una Muestra de Adultos de West Indies

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RESUMEN

Objetivo: *El objetivo de este estudio fue investigar el nivel de ansiedad dental y sus posibles causas entre las personas en Trinidad y Tobago.*

Método: *Éste es un estudio transversal de padres y guardianes que acompañan a los niños que asistían a una clínica dental pediátrica.*

Los participantes llenaron un cuestionario mientras se hallaban en la sala de espera. El cuestionario incluía la Escala de Ansiedad Dental Modificada (EADM), edad, género y ocupación. Se incluyó un punto adicional que pedía a los participantes que clasificaran la ansiedad que sentían por la extracción de un diente.

Resultados: *Había 100 participantes (81% hembra). En general, el 40% de los participantes reportó sentir una ansiedad de moderada a severa. El veintitrés por ciento de los participantes tenía una ansiedad moderada (EADM 15–18) y el 17% tenían ansiedad severa/fobia (EADM 19–20). El nivel de ansiedad guardaba relación con el género (regresión logística múltiple* $p < 0.05$*). Muchos participantes estaban muy/extremadamente ansiosos por tener un diente bajo la fresa dental (48%), una inyección con anestésico local (53%) y una extracción (52%). Treinta y seis por ciento de los participantes habían evitado el tratamiento dental en el pasado porque se sentían demasiado ansiosos.*

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Conclusión: *Se encontraron niveles altos de ansiedad dental en esta muestra de adultos trinitenses. La EADM pudo detectar elementos significativos de esa ansiedad. Al añadirse una pregunta sobre extracción, se puso de manifiesto que este procedimiento puede contribuir substancialmente al problema de la ansiedad hacia el tratamiento dental en el Caribe.*

Palabras claves: Caribeño, ansiedad dental, cuidado dental fobia

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INTRODUCTION

Anxiety is defined as '*a state of apprehension resulting from the anticipation of a threatening event or situation'* (1). It is distinguished from fear which occurs in the presence of an observed threat (2). Anxiety toward dental care is recognized as a significant problem (3–9). The aetiology of dental anxiety depends upon the age of onset. During childhood, the cause is usually a negative dental experience but in adulthood it is more likely due to general anxiety states (10). Severe dental anxiety can present as a 'dental phobia'. The American Psychiatric Association defines phobia as '*marked and persistent fear that is excessive or unreasonable cued by the presence or anticipation of a specific object or situation'* (11).

Dental anxiety can cause people to delay or avoid seeking dental care despite being in need of treatment (12, 13). Compared with Dental patients who were not anxious, the individuals had more missing and fewer filled teeth and are four-times more likely to be in need of immediate treatment due to pain or dental infection (14). Avoidance of treatment by anxious patients has also been associated with a deterioration of their oral health-related quality of life (15–17).

A variety of questionnaires and rating scales have been developed to measure various aspects of dental anxiety. Methods which can be utilized include clinical interviews, behavioural observation and psychometric scales. Psychometric scales are generally used because they are easy to administer. The Corah Dental Anxiety Scale (CDAS) has been used extensively in clinical practice and research (18, 19). It is simple, consists of four questions and can be scored rapidly. One problem with the CDAS is that it provides one set of answers for its first question and a different set for the other three questions making it difficult to compare the answers (19).

The Modified Dental Anxiety Scale (MDAS) also takes the form of a self-administered questionnaire consisting of five items with each having the same five answer alternatives, making it easier to compare responses. Unlike the CDAS, the MDAS questionnaire also includes a question on dental injections.

The prevalence of dental anxiety varies between countries with a low of 4% in Denmark (8) to a high of 14% in Singapore (4). Although studies on anxiety have some methodological difference, the findings suggest a general trend of higher levels of dental anxiety in developing countries, possibly influenced by differences in culture and dental healthcare systems (20–23).

Nothing is known about dental anxiety in the English-speaking Caribbean, in particular its prevalence and severity and underlying causes. Such information is valuable as being sensitive to a patients' level of dental anxiety, the ability to measure it and the use of treatment modalities to reduce it, when necessary, form an important role in the delivery of high quality oral health care.

The aim of this study is to investigate the level of dental anxiety and its possible causes among people in Trinidad and Tobago.

SUBJECTS AND METHOD

The study was conducted at the Child Dental Health Unit (CDHU), School of Dentistry of the University of the West Indies, Trinidad and Tobago. Consecutive parents/guardians accompanying children who were attending the clinic for dental treatment, were asked to complete a questionnaire while in the waiting room. The questionnaire included an instrument to measure dental anxiety, the Modified Dental Anxiety Scale (MDAS)

MDAS

The MDAS asks the patients to score their level of anxiety with respect to five dental situations using a five-point scale (1 = not anxious to 5 = extremely anxious). The questions are 'How *anxious would you feel if* 1/ 'you went to your dentist for treatment tomorrow', 2/'if you were sitting in the waiting room', 3/ 'about to have a tooth drilled, 4/ ''about to have your teeth scaled and polished', 5/ 'about to have a local anaesthetic injection'. The minimum score = 5, maximum score = 20. For clinical purposes, the developers of the MDAS described 'clinical cut-off points' as scores of 15–18 indicating moderate anxiety and 19 and over as severe anxiety with a strong likelihood of dental phobia (19). The validity of these values was established using data from a general population and patients attending a dental clinic (19). Overall the MDAS has been shown to have good psychometric properties and excellent validity and reliability and can be used regardless of phobic status (19, 24, 25, 26). Along with the 5 standard MDAS questions, an additional item, which asked participants to rate the anxiety felt on having an extraction, was included.

Further questions included demographics (age, gender and occupation). The criteria and categories for occupation were based on the UK Registrar General Classification for social class (27), as modified for the Trinidadian population by Singh *et al* (28).

Information was also obtained about whether participants had ever avoided dental treatment due to anxiety and experiences that may have caused dental anxiety. The information obtained was entered into a computer database/ statistical software package (SPSS version 16), for storage and analysis. Descriptive statistics, along with multiple logistic regression and analysis of variance were used to explore relationships between variables. Approval for the study was gained from the Mount Hope Dental Hospital within which the CDHU is based.

Sample characteristics

All 100 parents/guardians who were invited to participate, consented to complete the questionnaire. Their ages ranged between 18–65 years with the majority in the age group 26–45 years. Eighty-one per cent were female. People belonging to skilled/unskilled manual groups and housewives/ unemployed formed the majority of participants (66%) [Table 1].

Table 1: Demographics of the participants (n = 100).

		%
Gender	**male**	**17**
	female	**81**
	missing	**2**
Age	18–25	2
	26–35	37
	36–45	30
	46–55	20
	56–65	8
	over 65	1
	not known	2
Occupation	middle professional	8
	lower non-manual	19
	skilled manual	9
	unskilled manual	18
	unemployed/housewife	39
	not known	7

RESULTS

The MDAS in this West Indian sample showed a high internal consistency, with a Cronbach alpha coefficient of 0.87. The scale also showed good reliability with the addition of the question on extraction (Cronbach alpha 0.89).

The final analysis did not include data from the additional question on extraction so as to enable international comparisons with other countries that had used the MDAS. Overall, 40% of participants had a total MDAS of more than 15. Twenty-three per cent of the participants had a total of 15–18 (moderate anxiety) and 17% had a total MDAS of 19–20 (severe anxiety/phobia), [Table 2]. The proportions of participants in each question response of the MDAS is shown

Table 2: MDAS total score and anxiety level* (n = 100)

MDAS total score	Anxiety level	%
5–14	Low	60
15–18	Moderate	23
19 or more	Severe	17

*(*Question on extraction not included in MDAS score)*

in Table 3. A quarter of participants were very/extremely anxious about '*treatment tomorrow'* and over a fifth (21%) reported the same for sitting in a '*waiting room'* for dental treatment. Nearly half (48%) of participants were very anxious on anticipation of '*having a tooth drilled'*. Over half the participants were very/extremely anxious about having a *local anaesthetic injection* (53%) or about having an *extraction* (52%). The mean scores for each question in the MDAS is shown in Table 4. The highest mean scores were for 'local anaesthetic injection' and 'extraction' followed by tooth drilled.

Analysis of the relationship between anxiety level (total MDAS score) with age, gender and occupation was undertaken using multiple linear regression. Only gender was found to be related to anxiety level ($p < 0.05$), females being more anxious than males (Table 5). With respect to mean scores, three items in the MDAS caused more anxiety in females: '*treatment tomorrow'*, '*waiting room'* and '*having a tooth drilled* (*ANOVA* $p < 0.05$) [Table 6].

Thirty-six per cent of participants reported to have avoided dental treatment in the past because they were too anxious. When asked *'what (if any) aspect of previous dental treatment made you anxious?,* of the 68 participants who responded, 45.6% cited 'extraction', 33.8% 'injection', 14.7% 'filling' and 5.9% 'cleaning'. Sixty-five participants responded to the question *'why did you feel anxious following this experience?'* Of these 55.8% cited 'felt pain' 18.4% 'dentist was rough', 15.4% 'treatment was too long' and 10.8% 'other'.

DISCUSSION

The convenience sample used in this study may not be representative of the entire population of Trinidad and Tobago, however this research is the first of its kind in the English-speaking Caribbean and has highlighted some important issues. The MDAS was used in this study to investigate the participant's level of anxiety towards specific dental procedures and also as an overall score to assess anxiety towards dentistry. The MDAS is a highly consistent and reliable instrument and easy to administer (18). A total MDAS of 19 or more indicates a highly anxious dental patient who may even be dental phobic. However, it has

Table 3: Participants response to each question of the MDAS (n = 100)

How would you feel	Not Anxious %	Slightly Anxious %	Fairly Anxious %	Very Anxious %	Extremely Anxious %
If you went to the dentist for treatment tomorrow?	30	30	15	13	12
If you were sitting in the waiting room (for treatment?	41	21	17	16	5
If you were about to have a tooth drilled?	11	27	14	26	22
If you were about to have your teeth scaled and polished?	53	26	11	7	2
If you were about to have a local anesthetic injection in your gum?	9	24	14	21	32
If you were about to have an extraction (have your tooth pulled)?*	10	18	20	24	28

Table 4: Overall mean scores for all items in the MDAS (n = 100)

	Mean	Sd
Treatment tomorrow	2.47	1.359
Waiting room	2.23	1.278
Tooth drilled	3.21	1.351
Teeth scaled and polished	1.78	1.036
Local anaesthetic	3.43	1.387
Extraction	3.42	1.335

Table 5: Relationship of age, gender and occupation with MDAS score (multiple linear regression)

Independent variable	Unstandardized coefficients		Standardized coefficients	t	Sig
	B	Std Error	Beta		
Constant	7.641	3.416		2.237	0.028
Occupation	-0.113	0.364	-0.32	-0.309	0.758
Age	0.182	0.514	.036	0.354	0.724
Gender	3.008	1.419	0.220	2.120	0.037

Dependent variable: Anxiety score

Table 6: Relationship between mean MDAS rating and gender (ANOVA)

MDAS item	Gender	N	Mean	sd	Sig (t-test)
Treatment tomorrow	male	17	1.88	1.409	0.049
	female	81	2.59	1.321	
Waiting room	male	17	1.65	1.222	0.030
	female	81	2.38	1.261	
Tooth drilled	male	17	2.65	1.498	0.048
	female	81	3.36	1.297	

been argued that many 'dentally phobic' patients do not see their fear as being 'excessive' or 'unreasonable' (key markers of phobia) because they base their fear on past dental experiences that were highly traumatizing and involved a perceived loss of control of events in the dental situation (29). It has been suggested therefore, that dental phobia may have more in common with Post-Traumatic Stress Disorder [PTSD] (29).

Post-Traumatic Stress Disorder is a delayed and protracted response to a stressful event of an exceptionally threatening or catastrophic nature, defined as being outside the range of everyday human experience and which would cause distress in almost everyone (30). It should however be noted that dental phobia and PSTD are distinct disorders and that it is possible for individuals to develop both a PTSD and a phobia following a traumatic dental experience.

In this study, based on the MDAS, over 10% of the participants were considered to have high dental anxiety or phobia while over 20% were considered to have moderate dental anxiety. Similar results have been reported from studies around the world, particularly other developing countries (22–23). The findings in this Caribbean sample are also consistent with those of other studies reporting that females generally demonstrate higher levels of dental anxiety than males (22, 31, 32). Females in this study appear to have greater anxiety in anticipation of dental treatment.

Half the participants in this study indicated extreme dental anxiety with respect to having a tooth drilled and for having a local anaesthetic injection. The sight and sensation of anaesthetic needles and the sight, sound and sensation of the drill were rated as the most anxiety-eliciting stimuli in a Saudian population (33). Interestingly, in the present study,

the addition of the question on anxiety towards extraction showed that among this sample of Trinidadian adults, the anxiety felt for this procedure is comparable to that felt in anticipation of a local anaesthetic injection or having a tooth drilled. Previous experiences involving pain with injections or extractions appear to have influenced the level of dental anxiety in these subjects. These findings are consistent with research that has looked specifically at what procedures cause the most anxiety and whether past dental experiences influenced present levels of anxiety. Lithuanian adolescents with no past invasive dental treatment were less anxious than those who had such experience (21). In a Sri Lankan sample, people who had an extraction at the last dental visit were significantly more anxious than those who had restorative care (19). An investigation of 'anxiety-provoking' stimuli found that 'invasive' surgical procedures were rated as the most anxiety-provoking (34). In a Spanish sample of 804 dental patients, 10% experienced high level of stress before tooth extraction (35). Importantly, in this present study, having treatment from a 'rough dentist' seemed to have influenced participants who had negative dental experiences. The term 'rough' was used in the Caribbean context of the word here and referred to manner and personality as well as the 'hands-on care'. It has been reported that in people with low dental anxiety, previous history of pain during dental treatment was mitigated by having a caring and concerned dentist suggesting the dentist's personality and manner plays a major role in the patients perception and memory of the experience (36).

Dental anxiety caused over a third of the participants to avoid dental treatment in the past implying that it may be a significant problem in this society. It would also appear that the established fear invoking aspects of dental treatment (*ie* injection and drilling) reported in the literature and incorporated into measures of dental anxiety such as the MDAS may not be as sensitive in picking up anxiety levels in all situations, particularly in some developing countries. In these situations, dentistry is often less accessible due to low dentist to population ratio, geographic location and affordability (37). Extraction rather than restorative care may therefore be the more common mode of treatment for decayed and/or painful teeth. Such may be the case in Trinidad and Tobago where approximately 300 dentists serve 1.3 million people, with most registered dentists practicing in urban areas. Free treatment is available in public health centres (based in both urban and rural areas). However, these clinics are often poorly equipped and under-staffed, resulting in speed of treatment and maintaining a high patient flow when the clinician is 'in office' taking precedent. Significantly, extractions are the most common form of adult patient care carried out in health centres (38). Much of the invasive treatment for children would also be in the form of extraction either *via* the dentist or dental nurse (therapist). Furthermore, some dentistry in Trinidad is undertaken by unqualified dental practitioners (dental quacks) whose training and skill level would be questionable but yet appear to be popular among people from lower socio-economic groups and in areas where there are few public health centres (39). Therefore, although the well established aspects of clinical care (*ie* injections and drilling) as measured by the MDAS were relevant, the addition of a question on extraction revealed that this invoked similar levels of anxiety and may possibly be due to greater exposure to extractions as opposed to restorative care among this population.

CONCLUSION

High levels of dental anxiety were found in this sample of West Indian adults. The MDAS was found to be reliable and was able to detect significant elements of that anxiety. The addition of a question on 'extraction' revealed that this procedure may also play a large part in anxiety toward dental treatment in the Caribbean.

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