Dental anxiety among patients visiting a University Dental Centre

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Abstract

Objective: Fearful individuals often avoid care despite extensive dental needs and anxious patients feel more pain and of longer duration than less anxious patients. This study was designed to determine the prevalence and factors associated with dental anxiety among patients visiting a University Dental Centre in Nigeria.
Method: This cross-sectional study was conducted using an anonymous structured questionnaire randomly administered to patients attending the University College Hospital Dental Centre, Ibadan. The questionnaire requested for socio-demographic data, dental visit behaviour, history of traumatic dental treatment and level of apprehension when anticipating a visit to the dentist and physician. The level of dental anxiety was determined using the Modified Dental Anxiety Scale (MDAS). An MDAS score of 19 and above indicated high dental anxiety. Upon examination, DMFT of each patient was determined.
Result: A total of 471 respondents of which 262 (55.6%) were females participated in the study. Only 7.43% of the participants had MDAS score ≥19. About 10% of the females had high dental anxiety compared with 4.94% recorded for the males (p=0.01). Dental anxiety was more common among the younger age group, irregular oral health care seekers and among those with history of traumatic dental treatment. The respondents were more relaxed when anticipating a visit to a physician. Only gender could be used to predict high dental anxiety. Female gender significantly displayed high dental anxiety (odd ratio=3.05 and p=0.04) . The mean DMFT score for the patients was 2.48±3.30.
Conclusion: The prevalence of dental anxiety among the respondents in this study was 7.43% and only gender could be used to predict dental anxiety.

Key words: Dental anxiety, dental fear, MDA Scale, prevalence

Introduction

In Nigeria, high unmet restorative treatment needs and high prevalence of periodontal disease had been reported[1]. Previous studies suggested that patient with dental anxiety often present with more damaged or missing teeth and less restored teeth[2,3]. Dental anxiety may, therefore, play a role in the poor oral health utilization behaviour observed among Nigerians. Little changes had been observed in the prevalence of dental anxiety over the past decades despite advances in dental equipment, procedures and preventive measures[4]. Fear is defined as a primary and powerful emotion which alerts us about imminent danger, with respect to an object or situation[5]. 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 anxiety[5]. Freeman[6] reasoned that the diagnosis of dental phobia cannot be made solely on the basis of the patient's anxiety state, but in conjunction with the patient's history of previous dental visit behaviour. The patient who experiences a high intensity of dental anxiety together with a history of avoiding dental care is said to have dental phobia[6].
Dental anxiety has an enormous effect on the lives of its victims[7]. These effects may include: physiological disturbance, behavioral and cognitive changes as well as disruptions of social roles[7]. Fearful individuals often avoid care despite extensive dental needs[8] and anxious patients feel more pain and of longer duration than less anxious patients[9]. Many scales were developed in order to assess dental anxiety but modified dental anxiety scale (MDAS) which is employed in the current study has been shown to be more comprehensive, highly valid and reliable, with a simpler and more consistent answering system[10].
In addition, it does not increase patients' fears when completed[11]. Medline review conducted in the month of May, 2010 suggested that MDAS has not been previously applied in Nigeria. As a matter of fact, epidemiological studies on dental anxiety among Nigerian adults are scarce.
Also, a clear connection between dental anxiety, avoidance behaviour and dental health problems had been shown in many countries [12], but the relationship between these variables in Nigeria is not yet clear. The aim of this study was to determine the prevalence and factors associated with dental anxiety among patients attending the Dental Centre, University College Hospital (UCH), Ibadan.

Materials and method

This is a cross-sectional study conducted using an anonymous self-administered structured questionnaire. The questionnaire requested for socio-demographic data,

highest educational qualification attained, dental visit behaviour, history of traumatic dental treatment and level of apprehension when anticipating a visit to the dentist and physician. In addition, MDAS was incorporated into the questionnaire. The modified dental anxiety scale contains 5 multiple-choice items as follows:

1 = If you have an appointment with the dentist tomorrow, how will you feel?
2 = If you were sitting in the waiting room, how would you feel?
3 = If you were about to have a tooth drilled, how would you feel?
4 = If you were about to have your teeth cleaned at the dental clinic, how would you feel?
5 = If you were about to have a local anesthetic injection in your gum, how would you feel?

The scale has a consistent answering scheme for each item ranging from 'not anxious' to 'extremely anxious'. The scores for each of the 5-item responses were summed up to give an estimated value of anxiety giving a minimum score of 5 and a maximum of 25. An MDAS score of 19 and above indicated high dental anxiety that may require special attention by dental personnel.

The questionnaires were randomly distributed in the waiting hall of Dental Centre, University College Hospital (UCH), Ibadan among consenting dental out-patients who were at least 16 years old.

University College Hospital (UCH), is a renowned referral health institution located in the South Western part of Nigeria. The completed questionnaires were collected after clinical examination in the specialty clinics. The DMFT index of each subject was later recorded from their clinical records. The DMFT index was used to determine the prevalence of dental caries among the respondents. Patients who are less than 16 years, in poor state of health and those who declined participation were excluded from the study. The sample size was chosen by convenience.

Confidentiality and anonymity of the respondents was guaranteed and the ethical clearance for the study was obtained from the joint University of Ibadan and University College Hospital Ethical Review Committee before the commencement of data collection.

Table1: Frequency breakdown and N size for participant sample including MDAS means (SD) and percent ≥19

	N	%	Mean	SD	%≥19
Total	471	100	12.03	4.33	7.43
Gender					
Male	209	44.40	11.46	4.16	4.94
Female	262	55.60	12.48	4.42	9.92
Age group (years)					
16-35	251	53.30	12.24	4.40	8.76
36-55	140	29.70	12.20	4.30	7.14
56-75	69	14.60	11.41	3.98	4.35
>75	11	2.30	9.09	4.25	-----
Visiting the Dentist					
Regular	71	15.10	11.87	4.24	5.60
Irregular	261	55.40	12.08	4.49	8.80
Never	139	29.50	12.01	4.08	5.80
Educational status					
None	11	2.50	11.45	4.68	9.09
Primary Education	19	4.00	9.11	4.24	5.26
Secondary Education	65	13.80	12.63	4.15	9.23
Post secondary not University	105	22.30	11.70	3.65	2.86
University/ HND	259	55.00	12.20	4.52	8.49
Not indicated	12	2.50	13.00	5.21	16.67
Previous traumatic dental treatment					
Yes	56	11.90	12.75	4.15	8.93
No	415	88.10	11.93	4.35	7.23

Statistical analysis

SPSS for Windows version 16.0, (SPSS Inc Chicago Illinois, USA) was used for the analysis. Descriptive statistics was performed and frequency distribution, percentage, range, median, mean and standard deviation (SD) was generated. Student t-test was employed to compare means between two groups. The proportion of respondents who scored 19 and above in the MDAS was calculated across the demographic and behavioral variables. A set of percentiles was performed across gender and major age groups. Multiple logistic regression was employed to establish the independent association of demographic factors[11] (age, gender, educational level, self-reported dental visiting behaviour and DMFT index. Statistical significance was based on the probability values of p=0.05 For the purpose of multiple logistic regression, the age of the respondents

Table 2: Item frequency breakdown of MDAS across male and female samples

Question	Visiting Tomorrow		Waiting Room		Use of Drill		Scale& Polish		Injection		Visit to Medical Doctor	
Male	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
Not anxious	97	(46.4)	90	(40.1)	51	(24.4)	97	(46.4)	49	(23.4)	122	(58.4)
Slightly anxious	63	(30.1)	70	(33.5)	54	(25.8)	53	(25.4)	43	(20.6)	49	(23.4)
Fairly anxious	26	(12.4)	27	(12.9)	31	(14.8)	27	(12.9)	29	(13.9)	12	(5.7)
Very anxious	21	(10.1)	21	(10.1)	44	(21.1)	26	(12.4)	54	(25.8)	25	(12.0)
Extremely anxious	2	(1.0)	1	(0.5)	29	(13.9)	6	(2.9)	34	(16.3)	1	(0.5)
Total	**209**	**(100)**	**209**	**(100)**	**209**	**(100)**	**209**	**(100)**	**209**	**(100)**	**209**	**(100)**
Female												
Not anxious	127	(48.5)	102	(38.9)	46	(17.6)	105	(40.1)	40	(15.3)	136	(51.9)
Slightly anxious	80	(30.5)	89	(34.0)	47	(17.9)	73	(27.9)	40	(15.3)	66	(25.2)
Fairly anxious	22	(8.4)	34	(13.0)	47	(17.9)	41	(15.6)	50	(19.1)	25	(9.5)
Very anxious	26	(9.9)	27	(10.3)	78	(29.8)	31	(11.8)	71	(27.1)	21	(8.0)
Extremely anxious	7	(2.7)	10	(3.8)	44	(16.8)	12	(4.6)	61	(23.3)	14	(5.3)
Total	**262**	**(100)**	**262**	**(100)**	**262**	**(100)**	**262**	**(100)**	**262**	**(100)**	**262**	**(100)**

Table 3: Means, Medians, SDs and Percentiles for total MDAS score broken down by sex and age group

	Male				Female			
Age group (yrs)	16-35	36-55	56-75	>75	16-35	36-55	56-75	>75
N	122	51	30	6	129	89	39	5
Mean	11.44	12.02	11.33	7.83	12.98	12.30	11.46	10.60
Median	12.00	12.00	12.00	6.00	13.00	13.00	12.00	11.00
SD	4.26	3.98	3.81	4.26	4.23	4.49	4.16	4.16
Percentiles								
5	5	6	5	5	5	5	5	5
10	6	6	6	5	7	6	5	5
15	6	7	7	5	8	7	7	5
20	7	8	7	5	9	7	7	6
25	8	9	8	5	10	9	8	7
30	8	10	9	5	10	10	8	7
35	9	10	10	5	12	10	9	8
40	10	11	11	6	12	11	10	9
45	11	11	11	6	12	12	11	10
50	12	12	12	6	13	13	12	11
55	13	13	12	6	13	13	13	12
60	13	14	12	7	14	13	13	13
65	14	14	12	8	14	14	14	14
70	14	14	14	9	15	15	14	15
75	15	15	14	11	16	15	15	15
80	15	16	15	13	17	16	15	15
85	16	16	16	16	18	17	16	15
90	16	17	16	16	19	18	16	15
91	17	17	16	16	19	18	16	15
92	17	18	16	16	20	19	17	15
93	18	18	16	16	20	19	17	15
94	18	19	17	16	21	20	18	15
95	18	19	18	16	21	21	19	15
96	19	19	19	16	21	21	19	15
97	20	19	20	16	21	21	20	15
98	20	19	20	16	22	23	20	15
99	21	19	20	16	24	25	20	15

was grouped into: 16-39; 40-59 and those ≥60 years old and above and their educational qualification was dichotomized into those with and without university education.

Result

A total of 471 respondents of which 262 (55.6%) were females participated in the study. Only 7.43% of the participants had MDAS score ≥[19] **(Table 1).** When the gender of the respondents was considered, 9.92% of the females had high dental anxiety while only 4.94% of the males were found with this anomaly. The difference in the mean dental anxiety scores between the male and female respondents was statistically significant (Student t-test, p = 0.01). The proportion of participants with high dental anxiety decreased with increase in age. Respondents that did not visit the dentist regularly had the highest proportion of high dental anxiety (8.8%). Individuals with post secondary but not university education appeared to have the least dental anxiety. Participants who had history of traumatic dental treatment also presented with a higher proportion (8.93%) of individuals with high dental anxiety compared to respondents without such experience (7.23%).

Majority of the participants were "not anxious" on anticipating a dental appointment, sitting in the waiting room and during scaling and polishing procedures **(Table 2)**. The data also shows that the respondents were more relaxed when anticipating a visit to a physician. Generally, more females indicated higher dental anxiety on all the events investigated, but the difference is minimal for dental drill. The percentile norms for MDAS scores for the participants by age and gender were calculated and presented in **(Table 3)**. Almost 10% of the females scored above the cut off for MDAS whereas only 5% of the males had this score.

Of all the variables entered simultaneously for logistic regression, only gender could be used to predict high dental anxiety **(Table 4).** Female gender significantly displayed high dental anxiety (odd ratio=3.05 and p value=0.04). It is noteworthy that participants with 5 or more missing teeth were more than twice as anxious as those with no missing teeth even though this was not a predictor of dental anxiety. The mean DMFT score for the patients was 2.48±3.30.

Discussion

There were more female respondents (55.6%) in this study. This appears to be the trend in previous similar studies[5,11]. Most of our respondents visited the dentist only when there was a complaint (55.4%). This clinic attendance pattern had also been reported in other studies for developing countries like Nigeria[13] It is noteworthy that 71.2% of the participants employed by Humphris et al[11] regularly visit the dentist for check up. About 12% of our respondents reported previous traumatic dental experience. In a previous study[14], 16% of American and 59% of Japanese subjects reported previous traumatic

Table 4: Logistic regression to predict those at cut off of 19 or above on MDAS with variables age group, sex, education, self-reported visit to the Dentist and DMFT index, entered simultaneously.

Variable	odds ratio	95% CI upper	Lower	p value
Age group (yr)				
60+	1.00			
16-39	4.44	37.83	1.93	0.17
40-59	2.48	23.24	3.79	0.42
Gender				
Male	1.00			
Female	3.05	8.55	1.09	0.04
Education				
No University qualification	1.00			
University qualification	1.34	3.28	1.82	0.51
Self reported visit to the dentist				
Never	1.00			
Regular	1.14	5.12	3.84	0.85
Irregular	2.61	7.53	1.09	0.07
Number of carious teeth				
5< carious teeth	1.78	14.89	5.62	0.60
1-4carious teeth	1.50	12.60	4.72	0.71
No carious teeth	1.00			
Number of missing teeth secondary to caries				
5 <missing teeth	2.36	23.81	4.25	0.46
1-4missing teeth	1.11	10.89	8.84	0.92
No missing teeth	1.00			
Number of filled teeth				
5< filled teeth	1.94	10.67	9.34	0.97
1 - 4filled teeth	1.04	25.64	6.75	0.61
No filled teeth	1.00			

dental treatment. Patients with unpleasant experience during previous dental treatment will logically tend to be scared of subsequent treatments. The dental team should always bear this in mind.

About 7.0% of our respondents had high dental anxiety and the mean dental anxiety score was 12.03 (±4.33). Though this prevalence (7.0%) was less than the UK norms (11.6%), the mean dental anxiety score of our patients (12.03, ±4.33) was greater than that of the UK [11] (10.39, ±5.46). The prevalence of dental anxiety has been shown to range between 4 and 23.4% [4] depending on where the study was conducted. Adult Japanese are said to have a higher level of anxiety than their American counterparts and Japanese 9-year olds are reported to have significantly lower anxiety levels than children with similar age group in France and the US [14]. Also in our study, females significantly had high dental anxiety. This result corroborates previously published reports [11,12,14] on this subject. When the item frequency breakdown of MDAS was considered by gender, the females also showed higher anxiety levels as previously reported in the UK[11] and Japan[14]. However, it appears more UK respondents were not anxious about the anticipatory events and our male respondents appeared more extremely anxious about dental drill and injection.

The data obtained from this study further shows that a higher percentage of respondents were not anxious when contemplating seeing a physician compared to when anticipating a visit to the dentist. The presence of anxiety in patients awaiting medical care is widely acknowledged[15], but it appears from this study that the intensity is not as strong as that reported for dentistry. In addition, the data from this study on the relationship between age and dental anxiety is consistent with that reported in the literature[3,11,14]. The mean dental anxiety scores and the proportion of respondents with high dental anxiety decrease with increase in age. When the mean dental anxiety scores were considered against the educational background, there appears to be a variable pattern. Kanegane et al[5] found no link between education and dental anxiety but Humphris et al[11] reported an inverse relationship. In addition, the records used in this study showed that high dental anxiety was more common among individuals with history of irregular clinic attendance. A clear connection between dental anxiety, avoidance behaviour and dental health problems had previously been shown[12].

Expectedly, respondents who have had previous traumatic dental experience showed high dental anxiety level. Majority of the respondents with high dental anxiety in a previous study claimed that they were hurt at their last appointment[4]. One-fourth of the American adult population is believed to avoid dental treatment because of traumatic experiences which occurred earlier in life[16]. The percentile norms for MDAS scores for the participants by age and gender were calculated and the result shows that almost 10% of the females scored above the cut off for MDAS whereas only 5% of the males had this score. In the UK study[11], the percentile at which men reach the cut- off point was 90% in younger men (18-39 years) whereas in women this point was reached at the 85th percentile.

Multiple logistic regression analysis shows that only gender could be used to predict dental anxiety. Decayed, missing and filled teeth (DMFT) Index showed no statistically significant relation to dental anxiety in this study.

However, it is noteworthy that participants with 5 or more missing teeth were more than twice as anxious as those with no missing teeth even though this was not a predictor of dental anxiety. In the study by Mehrstedt et al[12] age and carious teeth were found to be significantly related to dental anxiety unlike missing teeth. The effect of filled teeth was not investigated. The mean DMFT score for the patients was 2.48±3.30. This confirms the report by Akpata[1] that DMFT score for most communities in Nigeria was less than

Irregular clinic attendance behaviour of the respondents in this study did not appear to be related to dental anxiety. It may be more strongly related to barriers like cost and lack of awareness of the need for regular oral check- up. Poverty and poor oral health awareness are both prevalent in our environment. However, it has been stated that the relationship between dental anxiety and avoidance is not a simple one[6]. This is because; some patients still manage to accept regular dental treatment despite their considerable dental fears [6]. Humphris et al[11] reported a significant relationship between lack of University education and dental anxiety. In this study, one of the reason why respondents with university education had a 1.34 times likelihood of having high dental anxiety may be related to their knowledge of possible HIV cross-infectivity in the clinical setting. A previous report [17] in the Nigerian environment showed that 28.2% of the participants were reluctant to receive oral health care because of fear of HIV cross-infection.

The current study was conducted in a clinical setting using randomly selected patients and convenient sample size. The data, therefore, may not be representative of the Nigerian populace. It is suggested that a community based study involving a large sample size and more appropriate distribution of participants be carried out.

As stated earlier, most people in the Nigerian environment seek dental care when there is pain and in fact when the teeth become non-restorable thus necessitating extraction. Tooth mortality sequel to dental caries still remained unacceptably high in Nigeria. The experience of authors in this study shows that some patients even till now prefer extractions to restorations due to cost and the belief that extraction solves the problem of toothache once and for all. Routine extraction is often preceded by dental injection, and use of elevators. It is therefore not surprising that patients considered some of the dental instruments and equipment as frightening.

Conclusion

The prevalence of dental anxiety among the respondents in this study was 7.43%. There were more respondents with high dental anxiety among the females and younger age group, those with secondary education, those with previous traumatic dental treatment and among those who visit the dental clinic irregularly. Only gender could be used to predict dental anxiety among our respondents.

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