Original Article

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Dentistry Section

Factors Influencing Anxiety among Patients in a Dental Setting: A Cross-sectional Study

SHANTHI VANKA[1], SAMAR HESHAM ALMWAILIGHI[2], LUJAIN JAMIL SHARQAWI[3], OHOUD ZAKI ALAIDAROOS[4], DIALA TARIQ ASHOUR[5], HEBA MANAR BARAKAT[6], OTHMAN WALI[7], AMIT VANKA[8]

ABSTRACT

Introduction: Dental Anxiety (DA) is a well-known obstacle that influences how patients behave and feel about receiving dental care. The Modified Dental Anxiety Scale (MDAS) is a widely used instrument for evaluating DA in patients attending dental clinics.

Aim: To determine the variables affecting DA in patients at a private dentistry college in Jeddah.

Materials and Methods: A cross-sectional study was conducted at Department of Preventive Dental Sciences, Ibn Sina National College for Medical Studies, Jeddah, Makkah, Saudi Arabia, from December 2023 to March 2024. A self-reported questionnaire was used as the data collection tool. The study comprised a total of 346 participants, with responses collected electronically via Google Docs. Participants were categorised into three groups—low, moderate and high DA—based on established risk indicators. The analysis of responses employed descriptive statistics, presented as mean±standard deviation. Associations between variables were assessed using the Chi-square test, with a p-value of less than 0.05 considered statistically significant.

Results: Among participants aged 18 to 30 years, 73 individuals (54.1%) reported low anxiety levels, 56 individuals (41.5%) reported moderate anxiety and 6 individuals (4.4%) reported high anxiety levels. In the cohort of participants older than 30 years, 84 individuals (39.8%) exhibited low anxiety, 103 individuals (48.8%) exhibited moderate anxiety and 24 individuals (11.4%) exhibited high anxiety levels. Examining gender differences, 58 males (58%) reported low levels of anxiety, while 8 males (8%) reported high levels. Comparatively, 99 females (40.2%) reported low anxiety and 22 females (8.9%) reported high anxiety levels. Although a majority of participants indicated low levels of anxiety, among postgraduate individuals, 6 (26.1%) reported high anxiety levels. Participants were also queried regarding their prior dental visits and of those who responded affirmatively, 157 individuals (45.4%) reported low anxiety, 159 individuals (45.9%) reported moderate anxiety and 30 individuals (8.6%) reported high anxiety.

Conclusion: The findings of the present study indicate that DA is significantly influenced by various factors, including age, gender, occupation, self-perceived oral healthcare and prior dental visit experiences. Addressing these variables may enhance the effectiveness of strategies aimed at mitigating DA among patients visiting dental clinics.

Keywords: Dental visits, Modified dental anxiety scale, Oral health

INTRODUCTION

Many individuals continue to perceive dental care as unpleasant and painful, despite significant advancements in healthcare technology [1]. DA represents a substantial issue that affects a considerable number of individuals globally. It manifests as a response triggered by dental treatment, making dental appointments some of the most stressful experiences for patients [2]. Chronic, irrational fear of dentists or dental procedures is a common characteristic of DA [3]. This condition is not limited by gender, age, culture, or socioeconomic status; rather, it impacts a diverse range of individuals. Patients' attitudes, beliefs and perceptions are often shaped by their social environments, familial influences, social media interactions and prior experiences [4].

This pervasive fear often inhibits individuals from seeking necessary dental care. DA may arise from various sources, including adverse past dental experiences, feelings of losing control while seated in the dental chair and a lack of trust in dental practitioners [5]. Several factors can influence the degree of DA experienced, including age, gender and educational attainment [6]. Specific fears, such as aversion to needles, discomfort with the sight of blood, or apprehension regarding dental instruments, may also contribute to the phenomenon [7]. Furthermore, traumatic experiences, isolated distressing incidents, unsettling stories relayed by family members, or negative perceptions about dentistry can exacerbate the fear associated with dental visits.

Thus, it is critical to identify anxious patients and provide tailored care to address their specific concerns [8]. DA serves as a significant barrier that influences patients' perceptions and behaviours regarding dental care. It can have detrimental effects on patient cooperation and attendance at dental appointments, ultimately resulting in compromised oral health and, in some cases, diminished quality of life [4]. Consequently, it is essential to identify and evaluate all factors contributing to anxiety during dental clinic visits to educate patients effectively and assist them in managing their apprehensions.

One widely utilised instrument for assessing DA among patients in dental clinics is the MDAS. This tool is both reliable and valid and can be translated into multiple languages for broader applicability [9-11].

In Jeddah, Saudi Arabia, it has been reported that a significant proportion (48.3%) of individuals experience DA [11]. However, research examining the underlying factors contributing to anxiety among patients attending dental clinics in Jeddah is limited.

Understanding DA in patients can enable dental practitioners to better comprehend patient behaviour concerning treatment and to implement effective strategies for mitigating such anxiety. Therefore, the present study aiimed to evaluate the variables affecting DA in patients at a private dentistry college in Jeddah, Saudi Arabia.

MATERIALS AND METHODS

A cross-sectional study was conducted at Department of Preventive Dental Sciences, Ibn Sina National College for Medical Studies,

Jeddah, Makkah, Saudi Arabia, from December 2023 to March 2024. The Institute's Ethics Committee approved the study with Ref. No. 004SRCDP30072023. Before data collection, participants were informed about the study's purpose and informed consent was obtained.

Inclusion and Exclusion criteria: All patients attending the study Institute within one month were considered for participation. Only patients above the age of 18 who consented to participate were included in the study, while those below 18 and those who did not provide consent were excluded.

Study Procedure

The self-reported questionnaire utilised as the data collection tool incorporated modifications and insights from previous questionnaires authored by Acharya S, Deogade S and Suresan V [4,6]. The questionnaire was translated into Arabic using a forward and backward blind translation process before being distributed to the participants. It was then proofread by a group of dentists to ensure the clarity and accuracy of the statements used in the questionnaire. A pilot test was conducted among 50 patients visiting the dental college clinics; however, the results from this pilot study were not included in the final analysis. The internal consistency was assessed using Cronbach's alpha, which yielded a reliability score of 0.85. The test-retest coefficients for the questionnaire items ranged from 0.95 to 0.98. Responses were collected electronically using Google Docs.

The questionnaire consisted of multiple-choice questions and was divided into two parts. The first part gathered demographic information, including age, gender, educational background, occupation, financial situation, history of previous dental visits, the length of time since the last visit, previous dental experiences and self-perceived oral health status (rated as excellent, good, average, or poor). It also included questions regarding the reasons for postponing dental treatment.

To assess participants' levels of anxiety, the MDAS was used [10]. Scores for the participants' anxiety levels were calculated based on the total score from the scale, with each item scored as follows:

1=Not anxious

2=Slightly anxious

3=Fairly anxious

4=Very anxious

5=Extremely anxious

The total scores for each participant ranged from 5 to 25 across five questions. A score of 1-9 was categorised as low anxiety, 10-18 as moderate anxiety and scores above 19 as high anxiety [9-11].

STATISTICAL ANALYSIS

The statistical analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 23.0. The analysis of responses employed descriptive statistics, presented as mean±standard deviation. Associations between variables were assessed using the Chi-square test, with a p-value of less than 0.05 considered statistically significant.

RESULTS

The study included 346 participants (see [Table/Fig-1]). The first question revealed that 138 low-anxiety participants (87.3%) felt no anxiety, while 93 moderate-anxiety participants (80.9%) felt slightly anxious. Among high-anxiety participants, 10 (52.6%) felt very anxious and another 10 (21.3%) felt fairly anxious.

For the second question, 134 low-anxiety participants (88.2%) reported no anxiety in the waiting area. Among moderate-anxiety participants, 103 (79.8%) felt mildly apprehensive, while 11 (55%) felt extremely anxious.

Question	MDAS low anxiety 1-9 n (%)	MDAS moderate anxiety 10-18 n (%)	MDAS high anxiety >19 n (%)	Mean	SD	Chi-square test	p-value
If you went to your dentist for treatment tomorrow, how would you feel? *							
Not anxious	138 (87.3)	20 (12.7)	0	1.850	0.9871	335.258	0.00
Slightly anxious	19 (16.5)	93 (80.9)	3 (2.6)				
Fairly anxious	0	37 (78.7)	10 (21.3)				
Very anxious	0	9 (47.4)	10 (52.6)				
Extremely anxious	0	0	7 (100)				
If you were sitting in the waiting room (waiting for treatment), how would you feel?*							
Not anxious	134 (88.2)	18 (11.8)	0	1.847	0.9704	339.853	0.00
Slightly anxious	23 (17.8)	103 (79.8)	3 (2.3)				
Fairly anxious	0	29 (76.3)	9 (23.7)				
Very anxious	0	9 (45)	11 (55)				
Extremely anxious	0	0	7 (100)				
If you were about to have a tooth drilled, how would you feel? *							
Not anxious	100 (95.2)	5 (4.8)	0	2.315	1.2142	322.784	0.00
Slightly anxious	55 (47)	62 (53)	0				
Fairly anxious	2 .6)	53 (94.6)	1 (1.8)				
Very anxious	0	32 (69.6)	14 (30.4)				
Extremely anxious	0	7 (31.8)	15 (68.2)				
If you were about to have your teeth scaled and polished, how would you feel?*							
Not anxious	131 (80.4)	32 (19.6)	0	1.931	1.1450	285.818	0.00
Slightly anxious	26 (25.2)	75 (72.8)	2 (1.9)				
Fairly anxious	0	33 (86.8)	5 (13.2)				
Very anxious	0	15 (60)	10 (40)				
Extremely anxious	0	4 (23.5)	13 (76.5)				
If you were about to have a local anaesthetic injection in your gum, about an upper back tooth, how would you feel?*							
Not anxious	71 (92.2)	6 (7.8)	0	2.662	1.3159	284.605	0.00
Slightly anxious	71 (68.3)	33 (31.7)	0				
Fairly anxious	12 (18.2)	52 (78.8)	2 (3)				
Very anxious	3 (5.3)	49 (86)	5 (8.8)				
Extremely anxious	0	19 (45.2)	23 (54.8)				

[Table/Fig-1]: Participants' responses to the Modified Dental Anxiety Scale (MDAS) questionnaire.
*p<0.05

The third question assessed anxiety before tooth drilling: 100 low-anxiety participants (95.2%) felt no anxiety, 62 moderate-anxiety participants (53%) felt slightly anxious and 15 high-anxiety participants (68.2%) felt extremely worried.

Regarding tooth scaling, 131 low-anxiety participants (80.4%) felt not at all anxious, 75 moderate-anxiety participants (72.8%) felt a little anxious and 13 high-anxiety participants (76.5%) felt extremely anxious.

For the fifth question on anxiety before a local anaesthetic injection, 71 participants (92.2%) felt no anxiety and 71 (68.3%) felt slightly anxious. Among those with moderate anxiety, 23 (54.8%) experienced acute anxiety and 52 (78.8%) felt quite nervous.

Based on risk indicators that divided the individuals into three groups (low, moderate and high DA), among the 18-30-year-old participants, low anxiety levels were recorded among 73 (54.1%), moderate anxiety among 56 (41.5%) and high anxiety among 6 (4.4%). Similarly, among participants older than 30 years, 39.8% had low anxiety, 48.8% had moderate anxiety and 11.4% had high anxiety levels. Nearly 58 (58%) of males and 99 (40.2%) of females reported low anxiety, while 8 (8%) of males and 22 (8.9%) of females reported high anxiety levels, respectively. The majority of the patients had low levels of anxiety, but among postgraduates, 6 (26.1%) reported high levels of anxiety [Table/Fig-2].

Variables	MDAS Low anxiety (1) n (%)	MDAS Moderate anxiety 10-18 n (%)	MDAS High anxiety >19 n (%)	Chi-square Test	p-value
Age (in years)*					
18-30	73 (54.1)	56 (41.5)	6 (4.4)	9.215	0.010
>30	84 (39.8)	103 (48.8)	24 (11.4)		
Gender*					
Male	58 (58)	34 (34)	8 (8)	9.386	0.009
Female	99 (40.2)	125 (50.8)	22 (8.9)		
Education					
Uneducated	1 (25)	3 (75)	0	12.248	0.057
School	27 (40.3)	35 (52.2)	5 (7.5)		
Degree/Diploma	121 (48)	112 (44.4)	19 (7.5)		
Postgraduation	8 (34.8)	9 (39.1)	6 (26.1)		
Occupation *					
Employed	69 (42.9)	82 (50.9)	10 (6.2)	17.731	0.007
Unemployed	31 (35.6)	42 (48.3)	14 (16.1)		
Student	35 (53.8)	26 (26)	4 (6.2)		
Retired	22 (66.7)	9 (27.3)	2 (6.1)		
Nationality					
Saudi	138 (45.5)	135 (44.6)	30 (9.9)	5.312	.070
Non Saudi	19 (44.2)	24 (55.8)	0		
Family income/month					
<3000 SAR	49 (45.4)	45 (41.7)	14 (13)	9.134	0.331
3000-5000 SAR	13 (38.2)	19 (55.9)	2 (5.9)		
5000-7000 SAR	14 (38.9)	20 (55.6)	2 (5.6)		
7000-10000 SAR	19 (38.8)	25 (51)	5 (10.2)		
>10000 SAR	62 (52.1)	50 (42)	7 (5.9)		
Self-perceived oral health*					
Excellent	62 (67.4)	28 (30.4)	2 (2.2)	45.150	0.000
Good	65 (43.6)	70 (47.0)	14 (9.4)		
Average	26 (31)	51 (60.7)	7 (8.3)		
Poor	4 (19)	10 (47.6)	7 (33.3)		
How many times do you brush your teeth					
Once	31 (38.8)	41 (51.2)	8 (10)	7.574	0.271
Twice	96 (47.8)	90 (44.8)	15 (7.5)		
Thrice	27 (50.9)	22 (41.5)	4 (7.5)		
Every other/few days	3 (25)	6 (50)	3 (25)		
Visit to dentist					
Yes	157 (45.4)	159 (45.9)	30 (8.6)	3.643	0.162
No	0	0	0		
If yes, time since last visit					
Within 6 months	70 (44.9)	75 (48.1)	11 (7.1)	9.273	0.320
6-12 months	33 (50)	29 (43.9)	4 (6.1)		
1-2 years	26 (45.6)	26 (45.6)	5 (8.8)		
>2 years	25 (39.1)	29 (45.3)	10 (15.6)		
Previous dental visit experience*					
Good	150 (45.6)	154 (46.8)	25 (7.6)	10.005	0.007
Bad	7 (41.2)	5 (29.4)	5 (29.4)		
Did you postpone the visit to the dentist?*					
Yes	41 (28.5)	88 (61.1)	15 (10.4)	28.730	0.000
No	116 (57.4)	71 (35.1)	15 (7.4)		
Reason to postpone the visit to the dentist?*					
I did not postpone my appointment	116 (57.4)	71 (35.1)	15 (7.4)	58.897	0.000
Anxiety/stress	2 (6.3)	33 (68.8)	12 (25)		
Access to dental care	23 (36.4)	40 (60.6)	2 (3)		
Finance	1 (66.7)	1 (33.3)	0		
Any other reason (Family obligations, busy, pain disappeared)	12 (44.4)	14 (51.9)	1 (3.7)		
I didn't visit a dentist	3 (100)	0	0		

[Table/Fig-2]: Participants' responses to the Modified Dental Anxiety Scale (MDAS) questionnaire and the independent variables.
* Chi-square test; p<0.05

Participants were categorised into employed, unemployed, student and retired groups. Low anxiety levels were noted for 22 (66.7%) of retirees, while 14 (16.1%) of the unemployed reported high anxiety. Among Saudis, 138 (45.5%) had low anxiety, 135 (44.6%) had moderate anxiety and 30 (9.9%) had high anxiety. Non Saudis showed similar trends. Family income analysis revealed low anxiety in those earning less than 3000 SAR, with 49 (45.4%) reporting low anxiety, 45 (41.7%) reporting moderate anxiety and 14 (13%) reporting high anxiety. Participants' self-perception of oral health revealed that those who assessed their health as excellent experienced the lowest anxiety, with 62 (67.4%) reporting low anxiety, compared to those who rated their health as poor, where only 4 (19%) reported low anxiety. Brushing frequency also correlated with anxiety levels; among those brushing twice daily, 96 (47.8%) had low anxiety, while among those brushing every few days, only 3 (25%) had low anxiety. Dental visit history showed that of those who had seen a dentist before, 157 (45.4%) reported low anxiety. The timing of dental visits also influenced anxiety, with those who had visited in the last six months showing that 70 (44.9%) had low anxiety. In summary, most participants reported moderate anxiety levels, with 116 (57.4%) not postponing their appointments [Table/Fig-2].

DISCUSSION

It is crucial to enhance patients' awareness of the recognised causes of DA. Dental professionals should conduct preoperative assessments of patients' anxiety levels and employ appropriate management techniques. This approach helps to build a strong therapeutic relationship, ultimately improving the quality of oral healthcare provided to patients.

The present study's findings reveal a notable correlation between age, gender and DA, consistent with the study by Alsakr A et al., [12]. Specifically, females exhibited significantly higher levels of DA than males. This trend has been observed in several studies [5,13-15]. This disparity may be attributed to societal norms that influence emotional expression. Women generally share their feelings of fear

and panic regarding dental procedures more openly, while men might suppress their anxieties due to societal pressures and the stigma associated with expressing vulnerability. Research supports the idea that women are more willing to express their anxiety, reflecting broader social dynamics that discourage men from discussing their fears. This difference in expression could contribute to the variations in reported anxiety levels between genders [16].

Respondent's occupation: In the present study, the majority of the employed and unemployed participants had moderate levels of anxiety compared to the students and the retired, who predominantly had lower levels of anxiety. Slightly different findings were noted in a study by Deogade S and Suresan V, in which unemployed and student respondents reported more DA compared to the employed group [6]. Retired participants had less DA than their younger counterparts. This suggests that both employed and unemployed individuals may experience specific pressures related to their roles and the anxiety levels among the employed might be mitigated by the structure and social interactions inherent in a work environment. Overall, the differences in anxiety levels across groups highlight the complex interplay of social roles, responsibilities and support systems in shaping individuals' experiences of anxiety [17].

Respondents' nationality: In a study by Alansaari AB et al., in 2023, nationality did not show significant associations with the levels of DA, in contrast to the present study results, where there was a significant association [18]. This could be associated with many factors, like cultural influences in which dental visits may be viewed with anxiety due to historical practices and beliefs. In countries where access to dental care is limited, negative experiences lead to increased anxiety levels and communication issues can exacerbate anxiety [18].

Respondents' self-assessed oral health: The majority of participants in the study conducted by Deogade S and Suresan V in 2016 reported perceiving their oral health status as good, which is consistent with findings from the current study [6]. Notably, respondents who rated their oral health as poor exhibited higher levels of anxiety, a trend that parallels the current study results as well as other research findings [19-21]. A positive self-assessment regarding oral health can foster greater familiarity with dental procedures, subsequently reducing anxiety levels. Furthermore, enhancing understanding of individual experiences among dental professionals and raising patient awareness of potential dental issues are effective strategies for mitigating DA.

Respondents' previous dental experiences and their visits to the dentist: In the current study, all participants had visited a dentist, with approximately 90% indicating a favourable experience. In Acharya S 2008 study [4], 87.1% of participants reported having visited a dentist and 77.6% noted a positive prior dental experience. It is important to recognise that past traumatic dental experiences significantly influence the increase in DA, as supported by several other studies [22-24]. Both the patient and the practitioner need to evaluate the patient's DA and these assessments should be incorporated into the development of strategies aimed at reducing anxiety. Establishing a robust patient-dentist relationship and fostering open lines of communication are vital components in alleviating DA.

Respondents' experience related to MDAS: In Acharya S 2008 study [4], it was observed that the highest mean and standard deviation values were associated with the question concerning individuals' feelings prior to receiving a local anaesthetic injection, followed by those regarding feelings before tooth drilling. In contrast, the lowest mean and standard deviation values were reported for questions related to anxiety concerning teeth cleaning, waiting for treatment and experiences the day before the dental visit. These findings suggest that dental procedures perceived as more painful are correlated with increased DA, a conclusion that resonates with the results of the present study.

The average score on the DA scale was 9.3 in a study conducted by Hoglund M et al., [25]. This finding indicates that a significant number of patients attending dental clinics experience moderate levels of anxiety. It is imperative for dental practitioners to objectively assess the subjective DA of their patients before implementing effective anxiety management strategies [26]. From a clinical perspective, several methodologies may be employed to mitigate anxiety, including open discussions regarding the patients' concerns and an assessment of whether cognitive behavioural therapy may be warranted based on the identified level of anxiety. Furthermore, it is essential to initiate preventive innovation programmes at the community level to educate patients about various anxiety prevention techniques.

Limitation(s)

The study has certain limitations. The patients in the study were those receiving care at dental clinics connected to a dental school and these clinics do not often see a diverse range of patients. The second limitation is that the use of the questionnaire as a data collection instrument could lead to an underestimation or overestimation of research participants' responses. Future research endeavours could focus on conducting a more extensive study to investigate patients' perceptions of anxiety and its correlation with the treatments they receive.

CONCLUSION(S)

The DA is significantly influenced by factors such as age, gender, occupation, self-perceived oral healthcare and past dental visit experiences. Targeting these variables may enhance the effectiveness of various methods for reducing DA among patients attending dental clinics.

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PARTICULARS OF CONTRIBUTORS:
1. Faculty, Department of Preventive Dental Sciences, Ibn Sina National College for Medical Studies, Jeddah, Makkah, Saudi Arabia.
2. Intern, Department of Dentistry, Ibn Sina National College for Medical Studies, Jeddah, Makkah, Saudi Arabia.
3. Intern, Department of Dentistry, Ibn Sina National College for Medical Studies, Jeddah, Makkah, Saudi Arabia.
4. Intern, Department of Dentistry, Ibn Sina National College for Medical Studies, Jeddah, Makkah, Saudi Arabia.
5. Intern, Department of Dentistry, Ibn Sina National College for Medical Studies, Jeddah, Makkah, Saudi Arabia.
6. Intern, Department of Dentistry, Ibn Sina National College for Medical Studies, Jeddah, Makkah, Saudi Arabia.
7. Vice Dean, Department of Oral Basic and Clinical Sciences, Ibn Sina National College for Medical Studies, Jeddah, Makkah, Saudi Arabia.
8. Faculty, Department of Preventive Dental Sciences, Ibn Sina National College for Medical Studies, Jeddah, Makkah, Saudi Arabia.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Shanthi Vanka,
Jeddah, Makkah, Saudi Arabia.
E-mail: shanthiamit@rediffmail.com

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