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Assessing Dental Anxiety and Practice-Related Cognition in Applicants to Ataturk University's Faculty of Dentistry

Atatürk Üniversitesi Diş Hekimliği Fakültesi Başvuranlarında Diş Kaygısı ve Uygulamayla İlişkili Bilişsel Yeteneklerin Değerlendirilmesi

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ABSTRACT

Objective: This study aimed to examine the cognitive characteristics of patients and their relationship with dental anxiety using the Modified Dental Anxiety Scale (MDAS) and the Dental Cognitions Questionnaire (DCQ).

Methods: A cross-sectional study was conducted with 85 patients (43 men, 42 women) from the Periodontics Department at Ataturk University. The MDAS and DCQ were administered to assess dental anxiety and negative cognitions. Statistical analysis was performed to compare cognitive patterns and anxiety levels across gender and anxiety severity.

Results: The study found significant gender differences in negative cognitions, with men exhibiting higher mean DCQ-B scores (46.41) compared to women (33.04). Additionally, individuals with moderate anxiety displayed significantly higher DCQ-F scores (P<.05) than those with low anxiety. No significant correlation was found between MDAS and DCQ-B scores**.**

Conclusion: The results support the hypothesis that negative cognitions are associated with dental anxiety, with significant gender differences in cognitive patterns. These findings suggest that cognitive approaches, such as cognitive-behavioral therapy (CBT), could be particularly effective in reducing dental anxiety by addressing these maladaptive thought patterns.

Keywords: Dental anxiety, negative cognitions, dental cognitions

ÖZ

Amaç: Bu çalışma, Modifiye Diş Kaygısı Ölçeği (MDAS) ve Diş Bilişleri Anketi (DCQ) kullanılarak hastaların bilişsel özelliklerini ve bunların diş kaygısıyla ilişkisini incelemeyi amaçlamıştır.

Yöntemler: Atatürk Üniversitesi Periodontoloji Anabilim Dalı'ndan 85 hasta (43 erkek, 42 kadın) ile kesitsel bir çalışma yapılmıştır. Diş kaygısı ve olumsuz bilişleri değerlendirmek için MDAS ve DCQ uygulanmıştır. Bilişsel örüntüler ve kaygı düzeyleri cinsiyet ve kaygı şiddeti açısından karşılaştırılmıştır.

Bulgular: Çalışma, olumsuz bilişlerde anlamlı cinsiyet farklılıkları bulmuştur; erkeklerde ortalama DCQ-B puanı (46,41) kadınlara (33,04) göre daha yüksektir. Ayrıca, orta düzeyde kaygıya sahip bireylerde düşük kaygıya sahip bireylere göre anlamlı derecede daha yüksek DCQ-F puanı (P<.05) bulunmuştur. MDAS ve DCQ-B puanları arasında anlamlı bir korelasyon bulunmamıştır.

Sonuç: Sonuçlar, olumsuz bilişlerin diş kaygısıyla ilişkili olduğu ve bilişsel örüntülerde anlamlı cinsiyet farklılıkları olduğu hipotezini desteklemektedir. Bu bulgular, bilişsel-davranışçı terapi (BDT) gibi bilişsel yaklaşımların, bu uyumsuz düşünce kalıplarını ele alarak diş kaygısını azaltmada özellikle etkili olabileceğini düşündürmektedir.

Anahtar Kelimeler: Diş kaygısı, olumsuz bilişler, diş bilişleri

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INTRODUCTION

Anxiety, a psychological state marked by apprehensive expectation or fear, is one of the most common psychiatric symptoms experienced by individuals.[1] A large population of adults suffer from dental anxiety.[2] The cognitive impact of a visit to the dentist can involve unhelpful thoughts, beliefs, fears, avoidance and other behaviors related to eating and oral hygiene.[3]

Dental anxiety is a common phenomenon characterized by an aversive emotional state marked by apprehension or worry in anticipation of dental treatment.[4] Elevated dental anxiety among adult patients correlates with a diminished quality of life and oral health, as well as an augmented tendency to avoid future treatments.[5] Those with dental anxiety often postpone or steer clear of dental care, leading to a deterioration of their oral health.[6] Dental anxiety not only prompts the avoidance of dental care but also

creates a vicious cycle of deteriorating oral health and broader psychosocial effects, including sleep disturbances, negative thoughts, and feelings of low self-esteem and confidence, ultimately requiring interdisciplinary treatment.[7]

Several tools exist for evaluating dental anxiety, with the four-item Dental Anxiety Scale (DAS) dating back as one of them.[8] Expanding upon the original DAS, Humphris et al. [9] created the Modified Dental Anxiety Scale (MDAS), comprising five questions spanning two domains related to dental treatment. Demonstrating strong validity, reliability, and simplicity (limited to five questions), the MDAS has been translated into various languages and extensively employed for clinically assessing dental anxiety worldwide. [10]

Both theorists and therapists have increasingly emphasized the importance of cognitive phenomena in understanding anxiety disorders.[11] According to Beck's (1976) cognitive model, emotional problems are accompanied by negative thought patterns concerning oneself and the external world. De Jongh and colleagues supported the applicability of the cognitive approach to dental anxiety.[12–14] These studies found a strong association between dental anxiety and the propensity to experience negative or threatening thoughts. A tool was created to enhance comprehension of the cognitive traits of dental patients and their connection to anxiety and fear. The tool employed for this purpose was the Dental Cognition Questionnaire (DCQ), which assessed the psychometric properties of respondents using a 38-item scale gauging the credibility of negative cognitions associated with dental treatment. [15]

This study aims to explore the cognitive characteristics of dental patients and their association with dental anxiety through the use of the MDAS and DCQ scales

METHOD

Procedures and Participants

In this study, patients who applied to the Department of Periodontics at Atatürk University Faculty of Dentistry during August-October 2023 were selected as the sample. Referencing Caltabiano et al.[16], a power analysis using G*Power indicated that a sample size of 42 participants per group, totaling 84 participants, was required to detect a significant difference between male (Mean(M) = 1.80, Standard Deviation(SD) = 1.10) and female (M = 2.48, SD = 1.10) mean MDAS scores with an effect size of 0.623 at 80% power and a 95% confidence level. This study is a cross-sectional study. Approval for the study was granted by the Ethical Dental Committee of the University of Ataturk (approval number: 42; meeting date: August 25, 2023), and the design adhered to the principles outlined in the Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Subjects.

Inclusion criteria:

(1) Age ≥ 18 years old;
(2) Agreeing to participate in the study voluntarily;
(3) Not having a psychiatric disorder;
(4) Being free from any conditions hindering conscious responses to the questions.

Exclusion criteria:

(1) Age <18 years old;
(2) Refusing to participate in the study voluntarily;
(3) Having conditions that might hinder conscious responses to the questions;
(4) Patients who were non-Turkish speakers and unable to cooperate.

Measures

In the initial section of our survey form, participants are requested to indicate their age, gender, and education level to determine their sociodemographic characteristics.

In the second section, we used the widely employed Modified Dental Anxiety Scale (MDAS), developed by Humphris et al.[9] The MDAS is a concise, self-administered questionnaire comprising five questions with a response format. The total score is calculated by summing up the patient's responses, with a maximum achievable score of 25[18]. A score below 11 is considered normal, while scores falling between 11 and 18 indicate moderate anxiety. Scores exceeding 19 represent severe anxiety.[19]

The Dental Cognitions Questionnaire (DCQ) was employed in the third and final section of the survey. Alçalar et al.[20] conducted a study to assess the psychometric properties, validity, and reliability of the Turkish version of the Dental Cognition Questionnaire. In this study, we used the Turkish version validated by Alçalar et al.[20] The detailed structure and scale items are included as supplementary material for further reference. DCQ consisted of 38 negative cognitions, encompassing beliefs and self-statements associated with dental treatment. The initial section included 14 negative beliefs about dentistry in general and the patients themselves. Participants were instructed to indicate "Yes" or "No" for each item following the sentences: "When knowing that I have to undergo dental treatment very soon, I think." The second section comprised 24 negative self-statements about participants' thought patterns during treatment. Again, participants were asked to mark "Yes" or "No" for each item following the sentence: "While being treated, I think." The total negative cognition score (DCQ-F) was calculated by summing the "Yes" responses, ranging from 0 to 38. The mean believability percentage for each item determines the level of belief in negative cognitions. Accordingly, the negative cognition score (frequency; DCQ-F) and the level of belief in these cognitions (believability; DCQ-B) are assessed.[21]

RESULTS

A total of 85 patients were part of the study, including 43 men and 42 women. Table 1 displays the mean of the scales applied to the sample.

Table 1. Mean of the scales.

	Mean
MDAS	10.49±3.63
DCQ-F	6.19±6.17
DCQ-B	40.87±31.53

MDAS: Modified Dental Anxiety Scale
DCQ-F: Dental Cognitions Questionnaire-Frequency
DCQ-B: Dental Cognitions Questionnaire-Believability

It was analyzed whether distinctions were present in the test scores based on the gender variable in Table 2. The mean DCQ-F for women was found to be 5.04, DCQ-B was 33.04, and MDAS was 10.97, while the mean DCQ-F for men was found to be 7.30, MDAS was 10.02, and DCQ-B was 46.41. Mean scores of DCQ-B between genders were found to be significant. Based on the results, no significant variance was found between genders concerning DCQ-F and MDAS scores.

Correlations between measures using Spearman's rho are presented in Table 3. All correlations except MDAS and DCQ-B were found to be significant.

When DCQ-F and DCQ-B values were analyzed within low and moderate anxiety groups, a statistically notable distinction was detected among individuals with moderate anxiety and their DCQ-F scores (Table 4).

Table 2. Gender-Based Comparison of Dental Anxiety and Cognition Scores

	Gender					
	Men		Women			
	Mean	SD	Mean	SD	Z	*P*
MDAS	10.02	3.62	10.97	3.61	-1.220	.220
DCQ-F	7.30	6.95	5.04	5.07	-1.850	.060
DCQ-B	46.41	28.82	33.04	25.17	-2.040	**.04**
SD: Standard Deviation						

Table 3. Association Between Dental Anxiety and Dental Cognition Scores

			Correlations		
			MDAS	**DCQ-F**	**DCQ-B**
Spearmen's rho	**MDAS**	**r**	1.000	.365**	0.049
		P		**.001**	.657
		N	85	85	85
	DCQ-F	**r**	.365**	1.000	.321**
		P	**.001**		**.003**
***Correlation is significant at the 0.01 level (2-tailed)*		**N**	85	85	85
	DCQ-B	**R**	0.049	.321**	1.000
		P	.657	**.003**	
		N	85	85	85

Table 4. Differences in Dental Cognition Scores Between Low- and Moderate-Anxiety Groups

	Low Anxiety		Moderate Anxiety			
	Mean	**SD**	**Mean**	**SD**	**Z**	***P***
DCQ-F	4.21	3.91	7.71	7.22	-2.35	**.01**
DCQ-B	37.95	32.46	40.83	23.54	-0.94	.34

MDAS: Modified Dental Anxiety Scale
DCQ-F: Dental Cognitions Questionnaire-Frequency
DCQ-B: Dental Cognitions Questionnaire-Believability
SD: Standard Deviation

DISCUSSION

This study contributes valuable insights into the relationship between dental anxiety and cognitive factors, particularly negative cognitions, in patients seeking periodontal care. Our findings highlight several key aspects of dental anxiety that align with, and in some cases diverge from, previous research.

Specifically, we observed that individuals with moderate dental anxiety exhibited higher levels of negative cognitions compared to those with low anxiety, which corroborates previous studies indicating a strong association between anxiety levels and cognitive distortions related to dental treatment.[15,21,22]

One of the significant findings in this study was the marked difference in negative cognition scores between male and female participants, with men reporting significantly higher levels of negative beliefs. This is an important contribution to the literature, as it suggests that gender may play a role in the cognitive processes underlying dental anxiety. While some prior studies have explored gender differences in general anxiety, few have specifically focused on how these differences manifest in the context of dental anxiety.[23] These results suggest that interventions aimed at reducing dental anxiety may need to consider gender-specific cognitive patterns to be more effective.

The strong correlation between dental anxiety and negative cognitions, as evidenced by the DCQ-F and DCQ-B scores, is consistent with previous research that emphasizes the role of cognitive factors in anxiety disorders.[21,22] According to cognitive theory, individuals with anxiety are prone to irrational or negative thought patterns, which exacerbate their emotional distress during potentially stressful situations, such as dental visits. Our findings align with the cognitive model proposed by Gasparro et al.[24] and further support the application of cognitive-behavioral approaches in managing dental anxiety.

In a study conducted by Mansell et al., the Dental Cognitions Questionnaire was utilized to treat the dental phobia of a patient with multiple phobias.[25] The study demonstrated that utilizing a cognitive approach to treat dental anxiety and phobia is an effective method.

While most of our findings were in line with expectations, the lack of correlation between the MDAS and DCQ-B scores was somewhat surprising. Since both scales measure different aspects of dental anxiety, one might anticipate a stronger relationship between them. However, this result suggests that while general anxiety about dental visits (as measured by MDAS) and negative cognitions (as measured by DCQ-B) are related, they may represent distinct constructs that warrant separate attention in both research and clinical practice.

As with any research, this study has certain limitations that should be acknowledged. The sample size, though adequate for statistical analysis, was relatively small and homogenous, limiting the generalizability of the findings to broader populations. Future studies should aim to include more diverse patient groups, both in terms of ethnicity and socio-economic background, to determine whether the observed gender differences and cognitive patterns hold across different demographic segments. Additionally, the reliance on self-reported measures such as the MDAS and DCQ introduces the potential for bias, as patients may underreport or overreport their levels of anxiety due to social desirability or misunderstanding of the questions. Utilizing cognitive approaches to manage dental anxiety and phobia, two major issues for dentists, would bring significant comfort. Therefore, cognitive approaches to addressing dental anxiety and phobia should be further supported and encouraged.

Given the importance of negative cognitions in the development and maintenance of dental anxiety, future research should explore the efficacy of cognitive-behavioral interventions in reducing these negative thought patterns. In particular, studies could investigate whether gender-specific cognitive-behavioral therapy (CBT) techniques might be more effective for men, who seem to exhibit higher levels of negative cognitions. Moreover, longitudinal studies examining how cognitive beliefs about dental treatment evolve, especially after interventions, could provide further insights into how to sustain reductions in dental anxiety.

This study underscores the importance of addressing cognitive factors in managing dental anxiety. By understanding patients' specific negative beliefs about dental treatment, dental practitioners can better tailor their communication and interventions to alleviate anxiety. Incorporating cognitive approaches, such as CBT, into routine dental practice may improve patient experiences and reduce avoidance of dental care, ultimately leading to better oral health outcomes. The findings suggest that targeting the cognitive dimensions of dental anxiety, particularly among male patients, could significantly enhance treatment adherence and patient comfort.

Ethics Committee Approval: Approval for the study was granted by the Ethical Dental Committee of the Atatürk University (approval number: 42; meeting date: 25/08/2023.
Informed Consent: An informed consent form has been obtained for adult patients.
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