



The Relationship Between Stress and Depression Levels in Patients with Temporomandibular Disorder

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Research Article

History

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ABSTRACT

Objectives: The aim of this study was to examine the relationship between anxiety and depression levels in patients with temporomandibular disorder (TMD).

Material-Methods: A total of 100 patients who applied to the Oral and Maxillofacial Surgery Clinic between March and June 2024 were included in the study. Fonseca anamnestic index (FAI) was used to evaluate signs and symptoms related to TMD and to determine symptom severity. Beck anxiety inventory (BAI) was used to evaluate anxiety. Beck depression inventory (BDI) was used to evaluate depression. Mean scores were evaluated between patients with and without TMD. Statistically significant differences were evaluated as $p<0.05$.

Results: A total of 100 patients, 52 female and 48 male, aged between 20 and 65 (mean 29.12 ± 9.19) were included in the study. The average FAI values of all patients were found to be 30.85 ± 22.82 , and TMD was found in 56% of the patients according to the FAI values. The mean BDI and BAI values of patients with TMD were found to be 12.84 ± 6.11 and 13.61 ± 10.29 , respectively. The mean BDI and BAI values of patients without TMD were found to be 9.25 ± 6.88 and 7.16 ± 6.34 , respectively. The mean BDI and BAI values in TMD patients were found to be significantly higher ($p<0.05$) than in patients without TMD.

Conclusion: There is a strong connection with TMD, depression and anxiety. High anxiety and depression have been observed in individuals with TMD.

Keywords: Anxiety, Depression, Temporomandibular Disorder.

Temporomandibular Bozukluğu Olan Hastalarda Stres ve Depresyon Düzeylerinin İlişkisi

Research Article

Süreç

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Öz

Amaç: Bu çalışmanın amacı temporomandibular bozukluğu (TMB) olan hastalarda anksiyete ve depresyon seviyelerinin ilişkisini incelemektir.

Gereç-Yöntemler: 2024 yılının mart ve haziran ayları arasında Ağız, Diş ve Çene Cerrahisi Kliniğine başvuran 100 hasta çalışmaya dahil edildi. Fonseca anamnestic indeksi (FAI), TMB'ye bağlı belirti ve semptomları değerlendirmek ve semptom şiddetini belirlemek için kullanıldı. Beck anksiyete ölçeği (BAÖ), anksiyeteyi değerlendirmek için kullanıldı. Beck depresyon ölçeği (BDÖ), depresyonu değerlendirmek için kullanıldı. Ortalama puanlar TMB olan ve TMB olmayan hastalar arasında değerlendirildi. İstatistiksel olarak anlamlı farklılık için $p<0.05$ olacak şekilde değerlendirildi.

Bulgular: Çalışmaya yaşları 20 ile 65 arasında değişen (ortalama $29,12\pm9,19$), 52 kadın ve 48 erkek toplam 100 hasta dahil edildi. Tüm hastaların FAI değerleri ortalaması $30,85 \pm 22,82$ olarak bulundu ve FAI skoruna göre hastaların %56'sında TMB bulundu. TMB olan hastaların ortalama BDÖ ve BAÖ değerleri sırasıyla $12,84 \pm 6,11$ ve $13,61 \pm 10,29$ olarak bulundu. TMB olmayan hastaların ortalama BDÖ ve BAÖ değerleri sırasıyla $9,25 \pm 6,88$ ve $7,16 \pm 6,34$ olarak bulundu. TMB hastalarındaki ortalama BDÖ ve BAÖ değerleri TMB olmayan hastalara oranla anlamlı derecede ($p<0,05$) daha fazla bulundu.

Sonuçlar: TMB, depresyon ve anksiyete ile kuvvetli bir bağlantı bulunmaktadır. TMB olan bireylerde yüksek anksiyete ve depresyon gözlenmiştir.

Anahtar Kelimeler: Anksiyete, Depresyon, Temporomandibular Bozukluk.

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Introduction

Temporomandibular disorders (TMD) are multifactorial conditions that involve a variety of clinical problems, including pain and functional limitations, affecting the joint, the masticatory muscles in the joint area, and the bones and nerves in the area.¹ Although the etiology of TMD is not known with certainty, it is assumed to be a multifactorial condition involving the interconnections of psychological and physiological factors, factors such as occlusion and trauma, parafunctional habits such as teeth grinding, and genetic factors. The combination of these factors can disrupt the static balance of the masticatory system and cause the signs and symptoms of TMD.² The most common signs and symptoms of TMD are chronic pain, pain in the jaw muscles, restriction of jaw movements, and sounds coming from the temporomandibular joint.³ TBM affects 15% to 20% of adult patients, with the highest incidence occurring between the ages of 20 and 40. It tends to be more common in female.⁴

Psychological/psychosocial and stress factors also attract attention in temporomandibular joint disorders, as it is a multifactorial structure that is open to more than one etiology. Therefore, the role of stress and personality factors in the etiology of TMD is subject to a comprehensive examination.⁵ The onset of TMD symptoms has been associated with high levels of anxiety, stress, and.⁶ Psychological studies have shown that patients with TMD have similar psychological definitions to patients with chronic pain disorders such as tension-type headaches and back pain that affect the musculoskeletal system.⁷ Although the DC/TMD classification is a standardized and widely used test for the differential diagnosis of TMDs, the complexity and difficulty of its use have led to the frequent use of less difficult diagnostic tests such as the Fonseca Anamnestic Index (FAI).⁸ FAI identifies the presence of TMD. It is a simple and low-cost patient-reported method used to differentiate between and absent.⁹

The aim of this study is to compare the depression and anxiety levels between individuals with TMD and healthy individuals. While TMD diagnosis was evaluated with FAI, anxiety level was evaluated with Beck anxiety inventory (BAI), and depression level was evaluated with Beck depression inventory (BDI).

Materials and Methods

Ethical Aspects and Study Design

Participants were fully informed about the study and took part voluntarily, adhering to the principles outlined in the Declaration of Helsinki. Approval for the study was obtained from the Eskişehir Osmangazi Non-Interventional Clinical Research Ethics Committee (Decision no: 2024/10). The study included 100 patients who visited the Eskişehir Osmangazi University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery clinic, between March and June 2024. Patients who were younger than 18 years of age, had systemic health problems, were missing survey data, and did not fully fill out the evaluation scales were excluded from the study. An experienced oral and maxillofacial surgeon who was trained on this subject examined all patients participating in the study and administered the surveys regarding the study.

Diagnosis of TMD

The diagnosis of TMDs was determined using the Turkish version of the FAI. The psychometric properties and diagnostic accuracy of this index have been validated by comparison with the Diagnostic Criteria for TMD (DC/TMD).^{9,10} FAI is an index used to evaluate TMD-related pain frequency, psychological stress, jaw functional limitations, and parafunctional behaviors. It is a survey consisting of questions. "No", "sometimes" and "yes" answers correspond to 0, 5 and 10 points, respectively. FAI shows the severity of TMD between 0 and 100.¹¹

Evaluation of Anxiety

Anxiety scores were evaluated using BAI.¹² This questionnaire contains a total of 21 items that reflect anxiety symptoms somatically, emotionally and cognitively. Validation and reliability of the scale in Turkish was carried out by Ulusoy et al. ¹³ BAI is a survey consisting of 21 multiple-choice questions regarding the participant's anxiety levels regarding how they have been feeling lately. The answers to the questions are scored between 0 and 3. High scores from the answers given indicate high levels of anxiety symptoms.¹⁴

Evaluation of Depression

Depression was assessed using the BDI questionnaire. The validity and reliability of this tool and its Turkish version were confirmed by Hisli et al.¹⁵ to predict the level of depression. This scale evaluates the emotional state of the patient through 21 questions related to his/her mental state in the last 24 hours. The total score is calculated by summing the responses.¹⁶

Statistical Analysis

SPSS 22.0 Windows (IBM Corporation, Armonk, NY, USA) program was used in the analysis of the data obtained in the study. Mean, standard deviation and minimum-maximum values were taken into account in descriptive statistics. The suitability of variables for normal distribution was assessed using the Shapiro-Wilk test. In comparisons between two groups, independent sample t-test was applied for data showing normal distribution and Mann-Whitney U test was applied for data not showing normal distribution.

Results

100 patients aged between 20 and 65 (mean: 29.12±9.19) were included in the study. According to the FAI score, TMD was observed in 56 patients, while TMD was not observed in 44 patients. 52% of the participants were female and 48% were male patients. Minimum maximum mean and SD FAI, BDI and BAI values of all patients are shown in Table 1.

Shows the mean/SD BDI and BAI scores for the TMD and WTMD groups for all participants. The TMB group showed significantly higher BDI and BAI scores than the WTMD group ($p<0.05$). (Table 2)

Table 1. Minimum maximum mean and SD values of FAI, BDI and BAI scores.

Variables	Minimum	Maximum	Total (n=100) Mean±SD
BDI	0	32	11.26±6.67
BAI	0	55	10.77±9.31
FAI	0	90	30.85±22.82
Age	20	65	29.12±9.19

Table 2. Relationship between BAI and BDI scores of individuals with TMD (FAI).

Variables	Total (n=100) Mean±SD	TMD (n=56)	WTMD (n=44)	p-value
BDI	11.26±6.67	12.84±6.11	9.25±6.88	<0.005*
BAI	10.77±9.31	13.61±10.29	7.16±6.34	<0.005*

TMD, temporomandibular disorder; WTMD, without temporomandibular disorder; *statistical significance; BDI, Beck depression inventory; BAI, Beck anxiety inventory

Discussion

Although many factors are involved in the etiology of TMD, psychosocial factors play a role in its onset or progression.¹⁷ Literature reviews have found a correlation between TMD and psychological factors.¹⁸ A recent study also reported a relationship between TMD and depression and anxiety.¹⁹ Another study indicated that the prevalence of TMD among university students was 46.8%, and emotional stress was 30.5%.²⁰ In a study conducted on adolescent individuals in Asia, it was found that those with TMD were more stressed than individuals without TMD. In a study including 578 Chinese individuals, they reported that 61.4% showed more than one symptom, anxiety rates were 74.4%, and depression rates were 38.3%.²¹ Another study conducted on 400 young individuals in Asia reported that individuals with TMD had high levels of stress, a high correlation with anxiety and depression.²² In Ekici's study⁵, it was observed that 27.3% of participants experienced mild anxiety, 16.9% had moderate anxiety, and 19.3% suffered from severe anxiety. Regarding depression levels, mild depression was found in 26.4% of participants, moderate depression in 22.6%, and severe depression in 4.7%. In general, abnormal levels of anxiety (63.5%) and depression (53.6%) were observed in more than fifty percent of patients with chronic temporomandibular joint disorders. This study also thoroughly examined the relationship between depression and anxiety in TMD patients.

FAI is an index used to classify TMD.²³ It consists of a total of 10 items. These items evaluate the limitations in mouth opening during jaw movements, painful mouth opening situations, crepitation and sound in the joint area, presence of teeth grinding accompanying bruxism, occlusion that may cause the disorder, and emotional changes.¹¹ First implemented in Portugal and later translated into English, FAI has been applied in Brazil, China, and Spain due to its high reliability and validity.^{8,10,24} Arıkan et al.²⁵ translated the FAI, which has high validity and reliability, into Turkish and evaluated it. In their study, they reported that it is a consistent, reliable, and valid method for diagnosing TMD diseases. They verified the validity of this index by comparing it with other indexes. The Turkish translated version of FAI is a

simple, easy-to-understand, easy-to-use and applicable scale. It is recommended to use it together with all its substances to evaluate and understand the individual's experiences. Based on these results, it has been reported that the Turkish version of FAI can be used in clinical practice and research.²⁵ In our study, we used the Turkish version of the FAI due to its high reliability in diagnosing TMD.

The Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI), developed by Beck et al., are reliable scales used to assess depression and anxiety levels in TMD patients.¹⁶ These scales are used to measure the level of depression and anxiety and to determine the frequency and level of symptoms.¹² The validity of both methods has been confirmed by various studies in the literature^{26,27}. A study by Maślak-Bereś et al.²⁷ evaluated patients diagnosed with TMD according to TMD/RDC criteria with patients without TMD using the Beck Depression Inventory (BDI) and Stress Scale and found that the values were higher in individuals with TMD than in individuals without TMD. Çebi et al.²⁸ conducted a study on 125 patients using the BDI and BAI in TMD patients and found higher scores on both scales in those with TMD. In our study, we utilized BDI and BAI due to their validity and reliability. The average BDI and BAI scores were found to be higher in individuals with TMD compared to those without.

The results discussed in the literature underscore the importance of assessing anxiety and depression in TMD patients. The diagnosis and treatment of TMD require a multidisciplinary approach to address all aspects of the problem. Therefore, using questionnaires that measure anxiety, depression, and other psychological factors in the initial evaluation of patients can assist dentists in identifying the need for treatments by other specialists. In this regard, further studies incorporating various tools are crucial for comparing results and determining the most suitable tool for clinical applications.²⁹

One of the important aspects of this study is that it includes a large number of patients with and without TMJ disease. This study also increases the accuracy of the research. However, it is not possible to definitively determine whether anxiety and depression contribute to the onset of TMD or if TMDs lead to these conditions.

Longitudinal cohort studies with specific research designs are needed to assess causality.

Conclusions

According to the results of our study, it can be said that there is a connection between anxiety and depression and TMD. It shows that patients with high levels of anxiety and depression are more likely to have TMD. This highlights the need to focus on the various factors that can cause TMD.

Acknowledgments

None

Conflicts of Interest Statement

The authors declare no conflicts of interest

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