

Research Paper: Anxiety and temporomandibular joint disorders among law students in Iran



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ABSTRACT

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Introduction: Temporomandibular Disorder (TMD) is a painful orofacial disorder that includes pain in the temporomandibular joint area, muscular weakness (especially masticatory muscles), mandibular movement limitation and joint clicks. Etiology of TMD is multifactorial and can be the result of psychological stress, occlusal interferences, inappropriate tooth position, dysfunction of masticatory muscle and adjacent structures, or a combination of all these factors. It is aimed to investigate relationships between anxiety, as a risk factor, and TMD.

Materials and Methods: This cross-sectional study was conducted in summer and fall of 2017 on 100 law students of Islamic Azad University of Bandar-e Anzali, Iran. In order to investigate signs, symptoms and severity of TMD, the Fonseca questionnaire and for assessing apparent and hidden anxiety, Spielberger questionnaire were used.

Results: The mean scores of hidden and apparent anxiety were 46.37 and 47.30. According to Fonseca questionnaire, most of the people were mildly disturbed by disorder (43%). There was no significant relationship between apparent anxiety and TMD ($p < 0.646$) and There was a positive and significant relationship between hidden anxiety and TMD ($p < 0.012$). The mean score of severity of temporomandibular disorder was 36.12 and most of the people were mildly disturbed by it (43%). According to the Fonseca questionnaire there was a positive and significant relationship between hidden anxiety and TMD ($p < 0.012$).

Conclusion: People with higher hidden anxiety experienced more TMD problems so it's better for most patients with TMJ problems to reduce their mental stress apart from dental treatments, otherwise dental treatment will not be sufficiently effective.

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Introduction

Temporomandibular disorder (TMD) is a series of orofacial disorders that consists of pain in the temporomandibular joint regions, muscular weaknesses (especially masticatory muscle), mandibular movement limitations and clicks existence.

TMD etiology is multifactorial and can be caused by psychological stress, occlusal interactions, inappropriate tooth position or loss of it, changes in body condition, dysfunction in masticatory muscles and adjacent structures, external and internal variations of TMJ building, or a combination of all these factors.(1)

Early diagnosis and treatment of TMD is very important because the disorder is progressive and becomes worse over time.(2) If TMD is treated at early stages, its prognosis is good but in the end stages, due to damages of TMJ (Temporomandibular joint), it becomes an irreversible disorder.(3) Various symptoms are considered to be diagnostic features of TMD.(4)

According to a theory, there is a relationship between joint inflammation and the presence of pain mediators (substance P), inflammatory mediators (cytokines and interleukins) and Tumor necrosing factor (TNF) in synovial matter. (5,6) Recent studies have also shown that the symptoms of TMD, especially pain, can increase the level of physical and mental harm, with negative effects on quality of life (QL). (7-12) In addition, the literature has shown that the severity of TMD is reflected in the decrease in oral health-related quality of life (OHRQL) so the early detection of TMD cases is important.(11)

Based on a study, stress, early loss of teeth, bruxism and gender are main factors in TMD.(13)

The incidence of TMD in patients with psychological stress is 2.65 times more than people without stress in a group of Iranian adolescents. (14) In relation to psychological stress, TMD is high especially amongst university students.(15)

The prevalence of TMD in general population is estimated to be 40% (16), but based on the study of Casanova-Rosado and et al. among university students it was reported to

be 46.9% (17) and among Brazilian university students, it was between 21/53% to 68% (18). In Iran, among dental students of Mashhad this rate was 51.5%.(19)

Anxiety is a relatively stable condition of worry and nervousness that is characterized by physical symptoms and is usually accompanied with compulsive behaviors and anxiety attacks. The relationship between anxiety and the underlying mechanisms of chronic pain, and specifically TMD, is not clear yet.(20)

The Fonseca questionnaire is a self-explanatory index that examines both objective and subjective symptoms as well as the severity of TMD.(21)

The Spielberger anxiety inventory is a self-administered standard measure for trait and state anxiety.(22)

Considering the high prevalence of stress and anxiety among university students and availability, simplicity and economical use of a questionnaire in diagnosing TMD, we decided to examine the relationship between anxiety and TMD among law students of Islamic Azad University of Bandar-e-Anzali; thus, by early diagnosis of TMD higher quality of life is achievable.

Material and methods

This study is an analytical-cross sectional study and a correlation study. The statistical population of this study was the students of Law School of Islamic Azad University, Bandar-e-Anzali. For this study, 100 individuals were selected randomly (randomized, sequential). In this study, the only condition for entering the study was the willingness of the individual to complete the questionnaire.

Information was collected through three questionnaires. Questionnaires were given directly to individuals. The time limit was not considered, but it was requested to return the questionnaires the same day and It was explained that there is no right or wrong answer to the questions.- Demographic data form was the first to fill. (Age, gender, current or previous history of psychiatric disorders, and if responded positively, medications used).

- The second questionnaire was Spielberger's Anxiety Scale

This scale had two final scores: one for trait or hidden anxiety and one for state or apparent anxiety. This questionnaire contains 40 questions.

The first twenty items examine state anxiety with four options (not at all, somewhat, moderate so, very much so), and the second part of the questionnaire examine trait anxiety with four options (almost never, sometimes, often, almost always). Participant must evaluate his/her feelings about each item with a four-point Likert scale.

The scoring of the questionnaire is done according to the test instructions by the psychologist and according to the scores of each person, the level of apparent and hidden anxiety is determined.

- The Fonseca anamnestic index (FAI) was the third questionnaire. This questionnaire is a simple scale for identifying signs and symptoms of TMD and measuring its severity and the degree of dysfunction. This questionnaire consists of ten questions about physical symptoms.

Each question has three options (yes= 10, no= 0, sometimes= 5). Patients are classified according to the total score as follow:

0 without TMD, 20-40 mild TMD, 45-65 moderate TMD, 70-100 sever TMD.(23,24)

The questionnaire was translated into Persian. Cronbach's alpha index was used to evaluate the "content validity" of the Persian version and two oral and maxillofacial specialists (faculty members) and two prosthetics specialists (faculty members) separately confirmed the validity of the questions. Values close to one in this index indicate the high compatibility of the components of the questionnaire. Cronbach's Alpha index for the Persian translation of the Fonseca questionnaire was obtained 0.82. To determine the reliability, the questionnaire was given to 20 normal people. Pearson correlation coefficient for two questionnaires was 0.895($p < 0.001$).

Results

Data were analyzed using SPSS19 software. Frequency and frequency percentage were calculated for qualitative data. The type 1 error (α)

was considered to be 0.05 and $p < 0.05$ was considered significant. In order to verify the normal distribution of variables, the Kolmogorov-Smirnov test was used and the results indicated that the distribution of variables was normal. So, in order to examine the questions, parametric tests (Pearson correlation) were used.

In this study, 100 undergraduate students at Islamic Azad University of Bandar-e Anzali participated. The age range of participants was 18-25 (mean= 21.5) and 67% ($n=67$) of them were male and 33% ($n=33$) were female.

The average hidden anxiety score was 46.37 (minimum score: 38 and maximum score: 57)

The average anxiety score was 47.30 (minimum score: 40 and maximum score: 55).

The mean of severity of temporomandibular malformation was 36.12. According to Fonseca questionnaire, most had mild problems (43%).

The relationship between apparent anxiety and TMD

To investigate the relation between apparent anxiety and TMD, Pearson correlation was used and the results indicated that there was no significant relationship between apparent anxiety and TMD.

($p < 0.646$)

The relationship between hidden anxiety and TMD

To investigate the relationship between hidden anxiety and TMD, Pearson correlation was used and the results indicated that there was a positive and significant relationship between hidden anxiety and TMD. ($p < 0.012$). In other words, people with higher hidden anxiety experienced more TMD problems.

The relationship between TMD score and TMD questionnaire

In order to determine the relationship between TMD score and questionnaire questions, Pearson correlation was used and the results indicated that

the score of each question had a positive and significant relationship with total score. In other words, by increasing the total score, people got higher scores in each item, except for the first question (is it hard for you to open your mouth?) that the relationship between the total score and the question was negative and significant ($p < 0.001$). In other words, by increasing the total TMD score, people received lower score in this question.

Among all the questions, the highest correlation of TMD total score was with question 4 (do you have frequent headaches?) ($p < 0.001$ and $df = 99$, $r = 0.778$) and the lowest correlation was TMD total score with question 10 (do you consider yourself a nervous person?) ($p < 0.001$ and $df = 99$, $r = 0.481$)

Discussion

In this study, Fonseca questionnaire (FAI) was used to determine the degree of temporal articulation disorders in university students. The Spielberger questionnaire was used to assess the level of apparent and hidden anxiety.

One of the problems that exacerbates joint problems and increases the severity of bruxism and muscle pains, is psychological stress. In general, the severity of bruxism is directly related to the patient's stress level. As a result, most patients, apart from dental treatments, should reduce their mental stress because otherwise dental treatment will not be sufficiently effective.

Individual's emotional state has an important role in development of T.M.J. Psychological stress is one of the most undeniable parts of our everyday life. Studies have shown that people who experience different degrees of stress often show increased muscle activity.(25)

Researchers find that various factors are effective in TMJ disorder. It is also believed that the occlusion factors, including early contacts of the eccentric motions, are among the most important determinants. Though psychological and traumatic factors affecting the joint and the construction of the building, which are inher-

ently or acquired in articular component, are other important factors.(26)

According to the results of this study, the mean of severity of temporomandibular disorder was 36.12. Based on the classification of the Fonseca

questionnaire, most of the people were in the group with mild impairment (43%), which is similar to other studies. (3, 17, 18, 21)

In a study, Nomura et al. (2007) using the Fonseca questionnaire showed that 53.31% dentistry students had jaw disorders, among which 35.88% suffered mildly and 11.93% suffered moderately from the disorder and 5.5% of them had severe disorder in jaw joints.(15)

In a cross-sectional descriptive study on dental students in Pakistan, Arsalan et al. (2014), using the Fonseca questionnaire, showed that 11 students (7.9%) had no problems in the jaw. 62 patients (44.3%) had mild disorders and 62 others (44.3%) had moderate disorders and 5 students (3.6%) had severe jaw disorders.(12)

In a study, PriyankaModi and colleagues (2012) examined the prevalence of TMD among students at Roral Dental School in India. The results showed that 45.16% of students had jaw disorders in different levels, of which 34.33% had mild and 8.38% had moderate and 1.96% had severe jaw disorders.(4)

In a study conducted by CarolinRiffel et al. (2015), the results showed that 489 (70.25%) patients at some levels had TMD and most of them (309) had mild TMD.(21)

DéboraBevilaqua-Grossi (2006), found that over 87% of participants had TMD symptoms, with the majority (78%) having mild symptoms. In particular, a significant number of participants had mild TMD (43.2%) and 34.8% were classified as average TMD.(21) In our study, 23% had no disorder, 43% had mild impairment, 25% had moderate disorder and 9% had severe disorder, which is consistent with all the studies in terms of classification in each category.

In the study of Larissa Kattiney de OLIVEIRA (2015), of 160 nurses who partici-

pated in the study, 25.5% had no symptoms of TMD, 43.3% had mild, 24.4% moderate and 8.8% severe symptoms of TMD. The researcher also concluded that there is a significant positive correlation between the trait anxiety score and TMD score.(28)

The results of this study showed that there was a positive and significant relationship between hidden anxiety and TMD ($p < 0.012$). This is consistent with previous research results.

In other words, people with higher anxiety experienced higher TMD problems. However, the relationship between TMD and apparent anxiety was not significant ($P < 0.646$). Pearson correlation was used to examine the relationship between the total TMD score and each questionnaire.

The results indicated that all questions except the first question (is it hard for you to open your mouth?) Have a positive and significant relationship with the total score. In other words, by increasing the total score, people got higher scores in each of the questions. However, in relation to Question 1 a negative relationship was meaningful ($p < 0.001$).

Arsalan Wahid et al. (2014), in their study on 200 medical students in Pakistan, showed that 44.3% of students had mild TMD symptoms, 44.3% moderate and 3.6% had severe symptoms.(12)

Priyanka Modi et al. (2012) reported in a study that 45.14% of students had TMD symptoms in a way that 34.33% had mild symptoms, 8.8% moderate and 1.96% severe symptoms (4).

In the present study, the highest correlation between TMD score and headache and facial muscle cramping was seen in question 4 (do you have frequent headaches?).

In Fujita et al (2003) study, 57 women with TMD, 40% of the patients had joint sound and 3.26% had articular sound and pain together. (29) In the Suvinen et al. Study (2004), the prevalence of TMD symptoms was 6-12% in the case group and 12-28% in the dysfunction.(30)

In relation to TMD's emotional state, some researchers report high levels of anxiety and depression in TMD patients, while others did not see any difference between the

above and normal control groups. Among the analytical studies conducted by Rudy et al, showed that more than half of the TMD subjects had severe emotional anxiety.(31)

In a study by Carolinc Riffel et al. (2015), it was concluded that there is a significant relationship between TMD and stress ($r = 21.77$) (21).

In a 2013 study in Brazil, conducted by CALIXTRE and colleagues, there appears to be a link between the potential of TMJ and the levels of anxiety / depression that will require further research in the future (24). In our study, the lowest correlation between the total TMD score with question 10 (Do you consider yourself a nervous person?)

Douglas Roberto Monteiro et al. (2011) in their study on 150 individuals aged 17-30 using Spielberger's Anxiety Inventory, concluded that 35.4% had low anxiety, 48.6% had moderate anxiety and 16% had high or serious anxiety. Also, there was a positive and significant correlation between trait anxiety and chronic orofacial pain and TMD in students (32).

Conclusion

Based on the results of this study, there was a significant and positive relationship between hidden anxiety and TMD ($p < 0.012$), although there was no significant relationship between apparent anxiety and TMD ($p < 0.646$). In other words, people with higher hidden anxiety experienced more TMD problems. Based on the results, it's better for most patients with TMJ problems to reduce their mental stress apart from dental treatments, otherwise dental treatment will not be sufficiently effective.

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None

Conflicts of interest

There are no conflicts of interest

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