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Association of Temporomandibular Disorder Symptoms with Anxiety and Depression in Saudi Dental Students

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Abstract

BACKGROUND: Temporomandibular dysfunction (TMD) is a term that encompasses a set of chronic painful conditions, and dysfunction in the orofacial region involving the muscles of mastication, the temporomandibular joints (TMJ) and related structures. It can affect individuals of any age.

AIM: We investigated the prevalence of temporomandibular disorder (TMD) and its association with anxiety and depression.

METHODS: Cross sectional study that conducted among 105 dental students (age 20-35 years). The assessment instruments were the Fonseca Anamnestic Questionnaire and the Hospital Anxiety and Depression Scale.

RESULTS: TMD was present in 52 (49.5%) students, and anxiety or depression was present in 53 (50.5%) students. The results of the HAD scale showed that 92 (83.4%) students had some level of anxiety or depression, 38 (36.2%) were border line for anxiety or depression, and 80 (76.2%) were diagnosed with anxiety or depression while regarding to the association of TMD with gender, 9 of 48 (17.3%) were males and 39 (82.7%) were females (P-value = 0.001).

CONCLUSION: Our study revealed a high prevalence of TMD. The women had a higher prevalence of TMD. Also, we reported the higher prevalence of anxiety and depression among TMD students.

Introduction

Temporomandibular dysfunction (TMD) is a term that encompasses a set of chronic painful conditions, and dysfunction in the orofacial region involving the muscles of mastication, the temporomandibular joints (TMJ) and related structures [1]. It can affect individuals of any age, although prevalence is higher among women and people aged 20-45 years [2]. Several studies indicate that approximately 60-70% of the population has at least one sign of TMD at some point in life, yet only 5% need treatment for TMD [3].

TMD is categorized as intra-articular (within the joint) or extra-articular (involving the surrounding musculature) [4]. Musculoskeletal conditions are the most common cause of TMD, accounting for at least 50% of cases [5]. Temporomandibular disorders (TMD) are characterized by craniofacial pain involving the joint, masticatory muscles, or muscle innervations of the head and neck [6].

Spasm of the masticatory muscles is a painful symptom in TMD and is caused by muscle distension, contraction, or fatigue due to the presence of parafunctional habits such as bruxism and onychophagia [2], [7]. Evidence indicates that myofascial pain and functional somatic syndromes such as fibromyalgia and chronic fatigue syndrome are comorbidities of the muscular pain that may be due to psychosocial factors. The manifestations of myofascial pain and discomfort coincide with moments of tension and stress, which causes muscular hyperactivity, and this tension can lead to parafunctional habits. Thus, psychosocial factors such as anxiety, stress, and depression might be important in the pathogenesis of TMD [8].

At the national level, the association of the prevalence of TMD with anxiety and depression has not been well studied. Such studies are needed to determine the prevalence of TMD, as the disorder affects many individuals who are unaware of their diagnosis. The aims of this study were to determine the prevalence of TMD symptoms with anxiety and

depression among Saudi dental students in Riyadh, Saudi Arabia.

Materials and Methods

This study, conducted in April 2017, consisted of an observational, analytical, and cross-sectional epidemiological study enrolled students who signed a consent form agreeing to participate in the study. This survey was applied at Alfarabi college of dentistry as a sample for Saudi dental students. In the informed consent document, all participants were informed of the objectives of the study and that they could withdraw from the study at any time. They were also assured of the confidentiality of the results obtained and their right to self-determination and privacy, thus respecting the ethical principles of research. The study was approved by Alfarabi college Institutional Ethical Review Board.

Population

The study population were dental students enrolled in all courses. All students who agreed to participate were eligible for inclusion, regardless of age or sex.

Measurements

The participants answered a questionnaire consisting of three parts: sociodemographic characteristics, the Fonseca Anamnestic Questionnaire, and the Hospital Anxiety and Depression (HAD) scale.

Sociodemographic characteristics of the participants

The sociodemographic information collected included age and sex.

Fonseca Anamnestic Questionnaire

The Fonseca Anamnestic Questionnaire is a modified version of the Helkimo Anamnestic Index and is one of a few such instruments available in Portuguese to assess the severity of TMD symptoms. The Helkimo Anamnestic Index was one of the first instruments to be confirmed as reliable in identifying TMD signs and symptoms [9].

It consists of ten questions, with answers options of no, sometimes, and yes. The items include questions on the presence of TMJ pain, head and neck pain, pain while chewing, parafunctional habits, limitation of joint movement, the perception of malocclusion, and emotional stress [9].

HAD scale

The HAD was developed by Zigmond and Snaith in 1983. We selected this scale because it is used to identify and measure the intensity of anxiety and depression in non psychiatric environments, as in the present population, and has been applied to this type of population in several previous studies [10]. The scale consists of 14 items divided into two scales. Seven items measure anxiety (HADS-A), and seven measure depression (HADS-D). Thus, the concepts of anxiety and depression are separated [11]. To complete the questionnaire, the participant selects the answer choice that is closest to what he/she felt during the previous week. Each item is scored from 0 to 3, depending on the response, and the maximum score is 21 points for each scale. In both scales, a score of 0-7 indicates the absence of anxiety or depression, a score of 8-10 indicates possible anxiety or depression, and a score of 11 or higher indicates presence of anxiety or depression [10], [11]. Thus, an individual could have no, either, or both anxiety and depression.

Statistical analysis

In the initial analysis, descriptive statistics were used to characterize all covariates. Then, the chi-square test of independence was used to evaluate associations of TMD with sex, age group and anxiety and depression. To ensure the applicability of the chi-square test of independence, TMD was classified as absent and present (which included mild, moderate, and severe TMD). For the presence of anxiety or depression, only two groups were considered: absence of anxiety and depression versus presence of anxiety or depression (which included individuals classified as having anxiety or depression and those with possible anxiety or depression). The statistical analysis was performed with the Statistical Package for Social Sciences (SPSS) version 19.0. Statistical significance was set at 0.05.

Results

The sample consisted of 105 students aged 20-35 years. There were 9 (8.6%) males and 96 (91.4%) females (Table 1).

Table 1: Demographic characters

		N	%
Sex	M	9	8.6
	F	96	91.4
Age	20-29	99	94.3
	30-35	6	5.7

Analysis of sociodemographic characteristics revealed that 52 students (49.5%) had TMD, which was classified as mild in 37 (35.2%) students, moderate in 10 (9.5%), and severe in 5 (4.8%) (Table 2).

Table 2: Prevalence of TMD

	N	%
No TMD	53	50.5
Mild	37	35.2
Moderate	10	9.5
Severe	5	4.8
Total	105	100.0

The results of the HAD scale showed that 92 (83.4%) students had some level of anxiety or depression, 38 (36.2%) were border line for anxiety or depression, and 80 (76.2%) were diagnosed with anxiety or depression (Table 3).

Table 3: Prevalence of Anxiety and depression

		N	%
Anxiety	No	73	69.5
	Borderline	16	15.2
	Yes	16	15.2
Depression	No	19	18.1
	Borderline	22	21.0
	Yes	64	61.0

Table 4 shows the associations of age group and gender with the prevalence of TMD, as determined by the HAD scale (*P* = 981, 0.001 respectively). Only the gender was significantly associated with the prevalence of TMD among our population where our results reported a higher prevalence of TMD among females.

Table 4: Association of TMD with demographic

			TMD		P value
			No (53)	Yes (52)	
Age	20-29	N	50	49	0.981
		%	94.3%	94.2%	
	20-29	N	3	3	
		%	5.7%	5.8%	
Sex	M	N	0	9	0.001
		%	.0%	17.3%	
	F	N	53	43	
		%	100.0%	82.7%	

Among the 52 (49.5%) students with TMD symptoms, 16 (30.8%) had signs of anxiety and 40 (76.9%) had signs of depression while among 53 (50.5%) students who hadn't TMD symptoms, 16 (30.2%) had signs of anxiety and 46 (86.8%) had signs of depression; the associations between occurrence of TMD regarding the anxiety and depression were statistically insignificant (*P* = 0.948, 0.189 respectively; Table 5).

Table 5: Association of TMD with anxiety and depression

			TMD		P value
			No (53)	Yes (52)	
Anxiety	Having anxiety	N	16	16	0.948
		%	30.2%	30.8%	
Sex	Having depression	N	46	40	0.189
		%	86.8%	76.9%	

Table 6 and Table 7 show the associations of age group and gender with the prevalence of anxiety and depression, as determined by the HAD scale (*P* = 0.341, 0.99 (anxiety) and P = 0.737, 0.285 (depression) respectively).

Table 6: Association of anxiety with demographic features

			Anxiety		p-value
			No anxiety	Anxiety	
Gender	Male	N	5	4	0..341
		%	55.6%	44.4%	
	Female	N	68	28	
		%	70.8%	29.2%	
Age	20-29	N	70	29	0.99
		%	70.7%	29.3%	
	30-35	N	3	3	
		%	50.0%	50.0%	

There was not significant association between prevalence of anxiety and depression regarding age group and gender. However, our results showed higher prevalences of anxiety and depression among students aged 20-29 years.

Table 7: Association of depression with demographic features

			Depression		p-value
			No	yes	
Gender	Male	N	2	7	0.737
		%	22.2%	77.8%	
	Female	N	17	79	
		%	17.7%	82.3%	
Age	20-29	N	18	81	0.285
		%	18.2%	81.8%	
	30-35	N	1	5	
		%	16.7%	83.3%	

Discussion

The results of this study revealed a high prevalence of TMD (49.5%) among the Saudi dental students in Riyadh, Saudi Arabia. In Portugal Minghelli et al., [6] conducted a similar study among Portuguese college students and they agreed with our results where they reported that TMD was present in 633 (42.4%) students, and anxiety or depression was present in 456 (30.5%) students. Otuyemi et al. (12) found a TMD prevalence similar to that in the present study among 308 students studying medicine and dentistry at the University of Nigeria. However, other studies, which used the same instrument to measure TMD prevalence in college students, reported even higher values [9], [10]. Nomura et al., [9] assessed TMD prevalence in 218 dental students at the University of São Paulo, Brazil and found that 53.2% had some degree of TMD. Among all relevant studies, the largest sample was in a study by de Oliveira et al., [13]: 2,396 students (age 22.1 ± 4.9 years) were evaluated in 15 Brazilian cities, and the prevalence of TMD was 68.6%. These differences in reported TMD prevalence may be due to the characteristics of the course of study, the time when the questionnaire was administered, and the characteristics of the populations.

Several earlier studies of different populations reported that the women had a higher prevalence of TMD [9], [10], [13]. In our study as compared with men, women had a P-value = 0.001 for TMD. This high prevalence of TMD in women might be due to physiological characteristics, particularly hormonal variations and structures in connective tissue and muscle [6]. The greater laxity of these tissues, which is related to estrogen level, may explain why these tissues are less able to support functional pressure, thereby leading to TMD [3]. LeResche et al., [14] found that pain intensity varied during the menstrual cycle among women with TMD: pain intensity was greater when estrogen concentration was higher.

The HAD showed that 83.4% of the present students had anxiety or depression. Inam et al., [15] found a lower prevalence of anxiety and depression (60%) among 252 students at Ziauddin Medical University, and Jadoon et al., [16] found a prevalence of anxiety and depression of 43.9% of medical students in Multan, Pakistan. Minghelli et al., [6] found a prevalence of anxiety and depression of 30.5% among medical students in Portugal Most of the present participants with anxiety and depression were women, as was the case in other studies [16].

Limitation: More-detailed clinical examination of TMD signs and symptoms and imaging tests to confirm the diagnosis would have been useful. The evaluation of the effects of student work and the area of traineeship would give strength to the study.

Our study revealed a high prevalence of TMD. The women had a higher prevalence of TMD. Our results also reported the higher prevalence of anxiety and depression among TMD students.

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