Prevalence of Temporomandibular Disorder in Undergraduate Dental Students:

A Questionnaire-Based Study

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Abstract

Background: Temporomandibular disorder (TMD) is a group of abnormalities in the temporomandibular joint area. TMD is a multifactorial condition since multiple physiological and pathological conditions are cited as etiological factors. Its clinical features include pain, clicking, deviation, and limitation in joint movement, and it may be associated with headache, neck ache, and disturbed quality of life. The type of treatment depends on the cause and severity of each case. Epidemiological studies and screening for the prevalence and clinical manifestations of TMD in the community could improve preventive measures and treatment outcomes.

Aim: To evaluate the distribution of TMD among undergraduate dental students.

Method: This study was a cross-sectional study conducted from March to June 2020. Questionnaires were sent to undergraduate students via email. The responses to questions were given numerical values to estimate the severity of TMD, and its presence and severity was determined based on self-reported responses.

Results: Two-thirds of respondents showed TMD of different severity. The TMD severity among respondents was as follows: 28.2% no TMD, 41.6% mild TMD, 24.1% moderate TMD, 6.2% severe TMD. Age and study grade were significantly associated with the severity of TMD.

Conclusion: Despite the limitations of this study, a considerable number of students expressed signs and symptoms of TMD, although they were unaware of this condition.

Keywords: temporomandibular disorder, questionnaire, TMD, dental students.

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Introduction

Temporomandibular disorder (TMD) is a term that refers to abnormalities in the temporomandibular joint (TMJ) area. These include pain experienced in the TMJ and muscles of mastication at function, and limitation and/or difficulties in mouth opening and chewing [1]. Patients with TMD may also have other symptoms such as headaches, disturbances in vision, and discomfort during sleep. Some patients have reported to neck ache [2]. TMD is marked as a multifactorial disorder as it may be due to congenital deformities, neoplasm, the inflammatory process, traumatic injuries, improper articulation, and emotional stress, all of which have been reported as causative or predisposing factors for TMD [3– 6].

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In severe TMJ cases, individuals suffer from pain during mouth opening, which motivates them to seek medical care [7]. There are multiple approaches to TMD treatment, ranging from physiological therapy to surgical intervention. The selection of the appropriate treatment modality is dependent on the underlying cause of the TMD. Some cases may need more than one treatment approach to have satisfactory outcomes [8]. Therefore, identifying the TMD-related causes and severity is crucial in the management of TMD.

Epidemiological studies can help early detection of TMD in a population through screening for TMD clinical manifestations, and thus enhance the possibility of successful management [9]. Several epidemiological studies have shown that more than half of the population have variable clinical features of TMD. It has been found that age is associated with an increased chance of TMD involvement. Moreover, the prevalence of TMD is higher in females, suggesting that sex can play a role in the pathogenesis of TMD. However, the outcomes of these epidemiological studies vary among different populations [10–14]. Therefore, the goal of this study was to evaluate the prevalence of signs and symptoms of TMD among dental students who were not diagnosed as patients with TMD using a specially designed questionnaire.

Materials and Methods Study design

This email-based questionnaire study was conducted from March to June 2020. The targeted population of the study was undergraduate dental students of Dijlah College University, Baghdad, Iraq. The questionnaires were sent (in English) to the students via email with an explanation of the objectives of the study. The students were asked to respond voluntarily and indicate their consent to participate. After receiving the replies, only questionnaires from respondents who indicated their consent were included. This study was conducted with ethical approval obtained from the Ethics Committee, Dijlah College University (Ref: Number1926 in 26/1/2020).

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Questionnaire design

The questionnaire used in this study was adopted from Fonseca [15]. The questions were divided into three sections (Table 1). The first section included demographic information (gender, age and study grade). For the study grade question, the responses were classified into either preclinical level (including first, second and third grade) or clinical level (including fourth and fifth grade). The second section was composed of four questions, the responses to which were yes/no. Any respondent who answered with a positive response to any of these questions was excluded from the analysis [16]. The third section included ten questions. The respondents were allowed to respond to each question by choosing one of the following answers: yes, no, or sometimes. Each response was given a numerical value (no = 0, yes = 10, sometimes =5). For each respondent, the summation of the numerical values of the questions of the third section was considered to determine the severity of the TMD as follows: absence of TMD (0-15), mild TMD (20-40), moderate TMD (45-65) and severe TMD (70-100) (17).

Table 1. Sections of the questionnaire

Section One
Age
Gender
Study grade
Section Two
Have you undergone orthodontic treatment?
Duration of orthodontics treatment
Have you been injured in the chin area?
Have you received any treatment for TMJ disease?
Section Three
Q1 Is it hard for you to open your mouth?
Q2 Is it hard for you to move your mandible from side to side?
Q3 Do you get tired /muscular pain while chewing?
Q4 Do you have frequent headaches?
Q5 Do you have pain on the nape or stiff neck?
Q6 Do you have earaches or pain in craniomandibular joints?
Q7 Have you noticed any TMJ clicking while chewing or when you open your mouth?
Q8 Do you clench or grind your teeth?
Q9 Do you feel your teeth do not articulate well?
Q10 Do you consider yourself a tense (nervous) person?

Statistical analysis

The data in this study were analyzed using SPSS (version 22 IBM Corp. Armonk, NY, USA). A Chi-square test determined the association of each question of the questionnaire's third section with demographic data. P-value < 0.05 was considered statistically significant for all statistical tests.

Results

The total number of respondents was 886. After applying the exclusion criteria, 400 respondents were excluded. The selected respondents were 208 males and 278 females. The median age of the respondents was 20 years. For the study grade, 303 respondents were at a preclinical level and 183 respondents were at a clinical level. The demographic data of the respondents are illustrated in Table 2.

Table 2. Demographic data of the							
respondents							
ex (n)							

L	
Sex (n)	
Male	208
Female	278
Age (year)	
Median	20.5
Range	18-23
Study Grade (n)	
Preclinical level	
Grade I	134
Grade II	97
Grade III	72
Clinical level	
Grade IV	85
Grade V	98

Two-thirds of respondents showed TMD with different severities. Based on Fonseca's index, the percentage of TMD severity among the respondents was as follows: 28.2% had no TMD, 41.6% had mild TMD, 24.1% had moderate TMD, and 6.2% had severe TMD.

The mild form of TMD was the major form in both sexes, with no statistically significant association. Age and grade were significantly associated with TMD severity. The association between the variables and the severity of TMD is summarized in Table 3.

Table 3. Association of variable with TMD severity								
TMD Severity								
		No TMD	Mild	Moderate (45-65)	Severe			
Variables [§]	Total [§]	(0-15)	(20-40)		(70-100)	p value*		
Sex								
Male	208 (42.8)	56 (26.9)	102 (49.0)	36 (17.3)	14 (6.7)	0.007		
Female	278 (57.2)	81 (29.1)	100 (36.0)	81 (29.1)	16 (5.8)			
Age								
≤20	298 (61.3)	98 (32.9)	102 (34.2)	71 (23.8)	27 (9.1)	< 0.001		
>20	188 (38.7)	39 (20.7)	100 (53.2)	46 (24.4)	3 (1.6)			
Study Grade								
Preclinical level	303 (62.3)	99 (32.7)	106 (35.0)	71 (23.4)	27 (8.9)	< 0.001		
Clinical level	183 (37.7)	38 (20.8)	96 (52.5)	46 (25.1)	3 (1.6)			
Total [§]	486 (100)	137 (28.2)	202 (41.6)	117 (24.1)	30 (6.2)			

§ Frequency (percentage)

* Significance at p < 0.05 by Chi square test

The analysis of each question's responses showed that sex, age, and study grade were significantly associated with malocclusion. The movement of the TMJ with clicking or noise during function was more significant in males than females. The presence of pain or discomfort in the neck region was significantly associated with females. Nervous status was the lowest negative response, while the difficulty in lateral movement of the lower jaw was the highest negative response. For both variables, no significant association was recorded with demographic variables. Table 4 shows the association between the variables and the responses to each question.

	Negative Responses [§]									
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Sex										-
Male	49	165	69	68	159	169	90	131	150	55
	(76.4)	(79.3)	(33.2)	(32.7)	(76.4)	(81.3)	(43.3)	(62.9)	(72.1)	(26.4)
Female	67	235	117	104	125	201	174	162	151	65
	(75.9)	(84.5)	(42.1)	(41.4)	(44.9)	(72.3)	(62.6)	(58.3)	(54.3)	(23.4)
p value*	0.88	0.14	0.04	0.05	< 0.001	0.02	< 0.001	0.29	< 0.001	0.43
Age										
≤ 20	222	251	100	111	182	225	151	174	207	67
	(74.5)	(84.2)	(33.6)	(37.3)	(61.1)	(75.5)	(50.7)	(58.4)	(69.5)	(22.5)
>20	148	149	86	61	102	145	113	119	94	53
	(78.7)	(79.3)	(45.7)	(32.5)	(54.3)	(77.1)	(60.1)	(63.3)	(50.0)	(28.2)
p value*	0.28	0.16	0.007	0.28	0.13	0.68	0.04	0.28	< 0.0001	0.15
Study										
Grade										
Preclinical	225	225	102	113	186	230	155	177	213	69
level	(74.5)	(74.5)	(33.7)	(37.3)	(61.4)	(75.9)	(51.2)	(58.4)	(70.3)	(22.8)
Clinical	145	145	84	59	98	140	109	116	88	51
level	(79.2)	(79.2)	(45.9)	(32.2)	(53.6)	(76.5)	(59.6)	(63.4)	(48.1)	(27.9)
p value*	0.21	0.21	0.007	0.25	0.09	0.88	0.07	0.27	< 0.001	0.20

Table 4. Association between the variables and the responses of each question

§ Frequency (percentage)

* Significance at p < 0.05 by Chi square test

Discussion

This study indicates that more than 70% of the responders had one or more of the clinical signs and symptoms of TMD. TMD is one of the more common disorders, after dental caries, with a wide range of signs and symptoms (18). Among the signs and symptoms, pain in the temporomandibular region, limitation in the movement of the mandible, clicking or evoking sounds in TMJ during chewing or other activity related to the lower jaw, pain and fatigue in masticatory muscles, headache and other manifestations have been reported (19-21). Early diagnosis of TMD depends on identifying such signs and symptoms during clinical examination and this plays an important role in the management of TMD and reducing its progress (22).

Several epidemiological studies have been conducted to investigate TMD and its related signs and symptoms in the community. Such studies help to estimate the prevalence of TMD and provide evidence for proper diagnosis and management (23–25). This study found that more than two thirds of the respondents had TMD of differing severity, consistent with previous studies that showed that more than half of the study sample had TMD (26–28). The frequency of TDM in this study was not statistically different between females and males, which is inconsistent with a previous report by Kmeid et al. (29), who reported that a higher percentage of females have TMD. This discrepancy might be due to differences in mean age, socioeconomic status. and educational level between the samples of the two studies. Mild forms of TMD were common in both genders in this study, followed by nonand TMD, moderate, severe forms, respectively; such findings are consistent with previous studies (30–31).

There was a significant association between

age and study grade with TMD frequency. The students aged over 20 who were enrolled in clinical practice during the fourth and fifth grades presented more TMD than those younger than 20 in the first three study grades. Several studies have reported that a high proportion of TMDs appear in those aged 20-30 (32). Moreover, the students might feel more stress and have anxiety while starting the clinical part of their academic study. Anxiety and stress are considered risk factors linked to TMD (33–34). The results of the current study showed that most of the students were nervous and less than one third had difficulty with lateral movement of the mandible. The association between the frequency of nervous respondents and the difficulty of mandible movement with TMD has been reported in previous studies (28, 32, 35).

Our data showed that malocclusion and aches in the neck area were higher in females than males, whereas TMJ clicking was more

References

- Okeson JP. Management of temporomandibular disorders and occlusion-E-book: Elsevier Health Sciences; 2019.
- Okeson JP, de Leeuw R. Differential diagnosis of temporomandibular disorders and other orofacial pain disorders. Dental Clinics. 2011;55(1):105-20.
- Chisnoiu AM, Picos AM, Popa S, Chisnoiu PD, Lascu L, Picos A, et al. Factors involved in the etiology of temporomandibular disorders-a literature review. Clujul medical. 2015;88(4):473.
- Pullinger AG, Seligman DAJTJopd. Quantification and validation of predictive values of occlusal variables in temporomandibular disorders using a multifactorial analysis. 2000;83(1):66-75.
- Suvinen TI, Reade PCJJoop. Temporomandibular disorders: a critical review of the nature of pain and its assessment. 1995;9(4).
- 6. Fischer DJ, Mueller BA, Critchlow CW, LeResche

common in males. Although these findings align with those of other authors (36–37), some studies have reported equal distribution of TMJ clicking in both sexes (38) or to be higher among women (39).

One of the limitations of this study was that the assessment of TMD was based on selfreported responses rather than clinical examination. Moreover, the respondents in this study were of a limited age range. The study was also conducted at a single university, and thus including students from other institutions would increase the validity of the results.

Conclusion

Despite the limitations of this study, a considerable number of students expressed signs and symptoms of TMD, although they were unaware of their condition. Periodic clinical examinations to check TMD among undergraduate students is thus highly recommended.

LJJoop. The association of temporomandibular disorder pain with history of head and neck injury in adolescents. 2006;20(3).

- Carlsson GE. Epidemiology and treatment need for temporomandibular disorders. Journal of orofacial pain. 1999;13(4).
- Kuttila M, Niemi PM, Kuttila S, Alanen P, Le Bell Y. TMD treatment need in relation to age, gender, stress, and diagnostic subgroup. Journal of orofacial pain. 1998;12(1).
- Dworkin SF, Huggins KH, LeResche L, Von Korff M, Howard J, Truelove E, et al. Epidemiology of signs and symptoms in temporomandibular disorders: clinical signs in cases and controls. The Journal of the American Dental Association. 1990;120(3):273-81.
- 10. Magnusson T, Egermark I, Carlsson GE. A longitudinal epidemiologic study of signs and

symptoms of temporomandibular disorders from 15 to 35 years of age. Journal of orofacial pain. 2000;14(4).

- Bilgiç F, Gelgör İE. Prevalence of temporomandibular dysfunction and its association with malocclusion in children: an epidemiologic study. Journal of Clinical Pediatric Dentistry. 2017;41(2):161-5.
- Umniyati H. The prevalence of Temporomandibular Disorder (TMD) and its severity among YARSI University Employees. 2020.
- Bagis B, Ayaz EA, Turgut S, Durkan R, Özcan MJIjoms. Gender difference in prevalence of signs and symptoms of temporomandibular joint disorders: a retrospective study on 243 consecutive patients. 2012;9(7):539.
- Ryalat S, Baqain ZH, Amin WM, Sawair F, Samara O, Badran DHJJocmr. Prevalence of temporomandibular joint disorders among students of the University of Jordan. 2009;1(3):158.
- 15. Topuz MF, Oghan F, Ceyhan A, Ozkan Y, Erdogan O, Musmul A, et al. Assessment of the severity of temporomandibular disorders in females: Validity and reliability of the Fonseca anamnestic index. CRANIO®. 2020:1-4.
- 16. Harman KE, Brown D, Exton LS, Groves RW, Hampton PJ, Mohd Mustapa MF, et al. British Association of Dermatologists' guidelines for the management of pemphigus vulgaris 2017. The British journal of dermatology. 2017;177(5):1170-201.
- 17. Al Moaleem MM, Okshah AS, Al-Shahrani AA, Alshadidi A, Shaabi FI, Mobark AH, et al. Prevalence and Severity of Temporomandibular Disorders among Undergraduate Medical Students in Association with Khat Chewing. The journal of contemporary dental practice. 2017;18(1):23-8.
- Dalaie K, Behnaz M, Khodabakhshi Z, Hosseinpour S. Impact of malocclusion severity on oral health-related quality of life in an Iranian young adult population. European journal of

dentistry. 2018;12(1):129.

- von Piekartz H. Temporomandibular disorders: neuromusculoskeletal assessment and management. Grieve's Modern Musculoskeletal Physiotherapy. 2015:433-44.
- 20. Phuong NTT, Ngoc VTN, Linh LM, Duc NM, Tra NT, Anh LQ. Bruxism, Related Factors and Oral Health-Related Quality of Life Among Vietnamese Medical Students. International Journal of Environmental Research Public Health. 2020;17(20):7408.
- Hartmann F, Cucchi G. Stress and Orality: New Data About Teeth Clenching & Outcomes, Migraine, Fibromyalgia, Fatigue: Springer Science & Business Media; 2013.
- 22. Wang X, Zhang J, Gan Y, Zhou Y. Current understanding of pathogenesis and treatment of TMJ osteoarthritis. Journal of dental research. 2015;94(5):666-73.
- 23. da Silva CG, Pachêco-Pereira C, Porporatti AL, Savi MG, Peres MA, Flores-Mir C, et al. Prevalence of clinical signs of intra-articular temporomandibular disorders in children and adolescents: A systematic review and metaanalysis. The Journal of the American Dental Association. 2016;147(1):10-8. e8.
- 24. Elagib MFA, Al-Qahtani S, Reddy M, Baldo SM, Sharif RA, Gokhale STJIJSS. Prevalence of signs and symptoms of temporomandibular joint disorders among Saudi population. A cross sectional study. 2018;6(6):52-5.
- 25. Nomura K, Vitti M, Oliveira ASd, Chaves TC, Semprini M, Siéssere S, et al. Use of the Fonseca's questionnaire to assess the prevalence and severity of temporomandibular disorders in Brazilian dental undergraduates. 2007;18(2):163-7.
- 26. Habib SR, Al Rifaiy MQ, Awan KH, Alsaif A, Alshalan A, Altokais Y. Prevalence and severity of temporomandibular disorders among university students in Riyadh. The Saudi dental journal. 2015;27(3):125-30.
- 27. Mude AH, Ikbal M, Dammar I, Rasul MI, Febriany

M. Prevalence and Severity of the Temporomandibular Disorder among Senior High School Students in Indonesia. Brazilian dental journal. 2020;18(2):163-7.

- Schmid-Schwap M, Bristela M, Kundi M, Piehslinger E. Sex-specific differences in patients with temporomandibular disorders. J Orofac Pain. 2013;27(1):42-50.
- 29. Kmeid E, Nacouzi M, Hallit S, Rohayem Z. Prevalence of temporomandibular joint disorder in the Lebanese population, and its association with depression, anxiety, and stress. Head Face Medicine. 2020;16(1):1-11.
- 30. Bonjardim LR, Lopes-Filho RJ, Amado G, Albuquerque RL, Goncalves SR. Association between symptoms of temporomandibular disorders and gender, morphological occlusion, and psychological factors in a group of university students. Indian Journal of dental research. 2009;20(2):190.
- 31. Karthik R, Hafila MF, Saravanan C, Vivek N, Priyadarsini P, Ashwath B. Assessing prevalence of temporomandibular disorders among university students: a questionnaire study. Journal of International Society of Preventive Community Dentistry. 2017;7(Suppl 1):S24.
- 32. Robin O, Chiomento A. Prevalence of risk factors for temporomandibular disorders: a retrospective survey from 300 consecutive patients seeking care for TMD in a French dental school. international journal of stomatology occlusion medicine. 2010;3(4):179-86.
- 33. Alzahem A, Van der Molen H, Alaujan A, Schmidt

H, Zamakhshary M. Stress amongst dental students: a systematic review. European Journal of Dental Education. 2011;15(1):8-18.

- 34. Al-Sowygh ZH. Academic distress, perceived stress and coping strategies among dental students in Saudi Arabia. The Saudi dental journal. 2013;25(3):97-105.
- 35. AlHussaini AA, AlHudithy LH, AlHadlaq MA, AlAzzam NF, Abahussain NW, AlDukhiel SA, et al. The prevalence and severity of temporomandibular disorder (TMD) among female dental students in Riyadh, Saudi Arabia. The Saudi Dental Journal. 2019;31:S55-S6.
- 36. Komazaki Y, Fujiwara T, Ogawa T, Sato M, Suzuki K, Yamagata Z, et al. Prevalence and gender comparison of malocclusion among Japanese adolescents: a population-based study. Journal of the World Federation of Orthodontists. 2012;1(2):e67-e72.
- Santos BFd, Fragelli TBO. Prevalence of temporomandibular joint disorders and neck pain in musicians: a sytematic review. Fisioterapia em Movimento. 2017;30(4):839-48.
- Pow EH, Leung KC, McMillan AS. Prevalence of symptoms associated with temporomandibular disorders in Hong Kong Chinese. Journal of orofacial pain. 2001;15(3):228-34.
- 39. Ali KFM, Aslam U, Khalid A, Kadri WB. Temporomandibular Joint Disorders And Gender Differences Among Habitants Of Karachi. Journal of Bahria University Medical Dental College. 2018:103.

انتشار اضطراب الفك الصدغي بين طلبة طب الأسنان الجامعيين: دراسة قائمة على الاستبيان

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الملخص

الهدف من الدراسة: اضطراب الفك الصدغي (TMD) هو مجموعة الاعتلالات في منطقة المفصل الصدغي الفكي، ويوجد عوامل متعددة (فسيولوجية ومرضية) قد تسهم في نشوء وتطور هذا الاضطراب، منها: الأعراض السريرية، والتي تشمل الألم وصوت يصدر في أثناء حركة الفك وانحراف وتحديد في حركة المفصل الصدغي الفكي، وقد يصاحب هذه الأعراض صداع وآلام في منطقة الرقبة والتأثير السلبي على نفسية المريض، ويعتمد نوع العلاج على سبب وشدة كل حالة، الدراسات الاستبيانية للتحري عن الانتشار والمظاهر السريرية للاضطراب الصدغي الفكي في المجتمع، والتي قد تسهم في تحسين التدابير الوقائية

الأساليب: كانت هذه الدراسة عبارة عن دراسة مقطعية أجريت من بين مارس ويونيو لسنة (2020)، وتم إرسال الاستبيانات إلى الطلبة عبر البريد الإلكتروني، والردود المستلمة عن الأسئلة أعطيت قيمًا عددية لتقدير وجود وشدة اضطراب الفك الصدغي. النتائج: أظهر نثاثا العينة اضطراب الفك الصدغي بدرجات مختلفة، وكانت شدة الاضطراب الفكي الصدغي بين المستجيبين حسب الآتي: (28.2٪) لا اضطراب الفك الصدغي،(41.6٪) اضطراب الفك الصدغي الخفيف،(24.1٪) اضطراب الفك الصدغي المعتدل، (6.2٪) لا اضطراب الفك الصدغي الحاد، إضافة إلى أنّ العمر ومرحلة الدراسة لها تأثير وارتباط مع شدة اضطرابات المفصل الفكي الصدغي.

الخلاصة: أظهرت الدراسة عددًا كبيرًا من الطلبة لديهم علامات وأعراض اضطراب الفك الصدغي مختلفة الشدة على الرغم من عدم وعيهم لهذه الحالة.

الكلمات الدالة: اضطراب الفك الصدغي، استبيان، اضطرابات المفصل الفكي الصدغي، طلبة طب الأسنان.