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Incidence of Temporomandibular Joint Disorders Among South Valley University Students

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KEYWORDS

Temporomandibular joint, Temporomandibular joint disorder, TMD, Orofacial pain

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ABSTRACT

Aim: Our study examined TMD prevalence in South Valley University students (SVU). The TMD incidence among students from different faculties was also examined to identify TMD risk groups. **Subjects and methods:** We obtained data concerning TMD symptoms and potential risk factors through custom questionnaires, and statistical analyses were performed utilizing SPSS. **Results:** We sampled 280 South Valley University students. A total of 133 male and 147 female students aged 18–23 participated. There were 120 (42.9%) medical students and 160 (57.1%) non-medical students. Helkimo's study index was 3,35, indicating mild TMD. Medical students had a slightly higher Helkimo's index (3.53) than non-medical students (3.23). Clinching, bruxism, and stress were higher among non-medical students than medical students. Medical students have lower life satisfaction (78.3%) than non-medical students (90.6%). Medical students (30%) had greater sleeping difficulties than non-medical students (20%(.It was noted that females have higher TMD than males Occlusion was 74% class 1, 21% class 2, and 5% class 3. About 50% of students in this study have had dental treatment, extraction, surgical, or endo. **Conclusion:** TMD signs and symptoms are present in the non-patient population, raising concerns over potential misdiagnosis. More research with bigger sample numbers is needed to raise awareness of TMD and aid early intervention.

INTRODUCTION

As per the American Dental Association's definition, Temporomandibular Disorders (TMD) encompass a range of orofacial conditions characterized by discomfort in the preauricular region, temporomandibular joint (TMJ), or masticatory muscles, along with limitations or irregularities in jaw movement, and audible TMJ sounds during jaw function [(1)].

Patients with TMD commonly experience pain in masticatory and cervical muscles, TMJ pain or sounds, and difficulties coordinating jaw movements, in addition to restricted mandibular motion [(2)].

The multifaceted etiology of TMD involves factors such as emotional stress, occlusal interferences, tooth loss, postural deviations, muscular dysfunction, and structural changes in the TMJ, with various combinations of these factors contributing to the disorder [3, 4].

TMD can affect individuals of any age or gender, exhibiting diverse signs and symptoms [5, 6].

However, diagnosing this condition can be challenging due to the variability of symptoms among different patients and even within the same individual over time [7].

The reported prevalence of TMD in various populations is notably high, with cross-sectional studies indicating that a significant portion of participants exhibit TMD findings or symptoms[6-9]. Pain is a primary symptom in TMD and often prompts patients to seek medical attention.

Researchers commonly attribute TMD to a combination of occlusal, neurophysiological, and psychological factors[6-8].

Low self-esteem is associated with a higher prevalence of TMD findings, highlighting the influence of psychological and emotional factors on the disorder. Myofascial pain dysfunction can be further categorized based on psychometric differences into myogenic and TMJ-related pain groups[8].

Symptom prevalence varies, and TMD diagnosis typically relies on identifying associated signs and symptoms. Numerous epidemiological studies have explored TMD prevalence among both patient and non-patient populations, revealing high rates of TMD signs and symptoms[9, 10].

TMJ disorders are more prevalent among younger individuals, particularly females, with psychological and emotional factors playing significant roles in TMD development [10-13].

Changes in TMJ morphology and function, such as condyle morphology alterations or disk displacement, can contribute to TMJ clicking without pain or substantial dysfunction.

Several epidemiological studies have indicated a higher incidence of temporomandibular joint (TMJ) noises among individuals aged 15 to 25 years[13-15].

This study aimed to examine the prevalence of temporomandibular disorder (TMD) among university students at South Valley University, following the guidelines recommended by the American Dental Association. Additionally, the study sought to compare the prevalence of TMD among students from various faculties, with the objective of identifying the risk groups associated with the development of TMD.

The null hypothesis stated that there is no prevalence of TMD among university students and that the prevalence of TMD is similar across different faculties.

SUBJECTS AND METHODS

The methodology involved the random distribution of a questionnaire to students from both medical and non-medical colleges. The questionnaire, once completed, included inquiries regarding various symptoms of TMD and potential risk factors, such as:

Gender, age, and body mass index.

Occlusion.

Helkimo's s index

Habits.

Headache, migraine.

Other joint pain.

Clenching.

Bruxism.

Life satisfaction.

Sleeping disorders.

Experience of stress or exposure to stressful conditions

Previous dental treatment.

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp, released in 2011). Categorical data were summarized as numbers and percentages. For continuous data, they were tested for normality by the Kolmogorov-Smirnov test. Quantitative data were expressed as range (minimum and maximum), mean, standard deviation and median. Spearman coefficient was used to correlate between not normally distributed quantitative variables while Pearson coefficient was used to correlate between normally distributed quantitative variables. Significance of the obtained results was judged at the 5% level

To explore associations between TMD symptoms (ear pain, clicking, TMJ locking, pain while chewing, and muscle tension) and potential risk factors, Helkimo's index was utilized.

RESULTS

The research sample comprised 280 students enrolled at South Valley University (SVU). Approval for all study phases was obtained from the SVU research ethics committee. All participating volunteers provided informed consent. Among them, there were 133 male and 147 female students, aged between 18 and 32 years. The sample included 120 (42.9%) students pursuing medical studies, alongside 160 (57.1%) students in non-medical fields.

The prevalence of various TMD symptoms within the study population is depicted in Table 1. Helkimo's index when recorded through this study was 3,35 and this indicates mild TMD

There was no significant difference between medical and non-medical students as regards Helkimo's index but it is slightly higher in medical (3.53) than in non-medical students (3.23) although clinching, bruxism, stress recorded higher in non-medical than in medical students

Also, life satisfaction level was less in medical (78.3%) than in non-medical students (90.6%)

Sleeping disorders were more common in medical (30%) than in nonmedical students (20%)

It was noted that the TMD is higher in females than males

As regards occlusion 73%was class1 while 26 were class 2 and 5% class 3

Through this study about 50% of the students give a history of Previous dental treatment extraction, operative, endo

Table (1) *Distribution of the studied cases according to different parameters*

	Total cases (n=280)	Non medicine (n=160)	Medicine (n=120)
Sex			
Male	133 (47.5%)	77 (48.1%)	56 (46.7%)
Female	147 (52.5%)	83 (51.9%)	64 (53.3%)
Age (years)			
Mean ± SD.	20.85 ± 2.20	20.58 ± 1.94	21.21 ± 2.47
Median (Min. – Max.)	21 (18 – 32)	20.5 (18 – 29)	21 (18 – 32)
BMI (kg/m^2)			
Mean ± SD.	23.83 ± 4.04	23.80 ± 4.44	23.86 ± 3.44
Median (Min. – Max.)	23.15 (15.63–54.20)	23.14 (17.16 – 54.2)	23.41 (15.63–35.01)
Occlusion			
I	206 (73.6%)	115 (71.9%)	91 (75.8%)
II	60 (21.4%)	37 (23.1%)	23 (19.2%)

	Total cases (n=280)	Non medicine (n=160)	Medicine (n=120)
III	14 (5%)	8 (5%)	6 (5%)
Maximum mouth opening			
Mean ± SD.	38.76 ± 3.6	38.64 ± 3.89	38.92 ± 3.19
Median (Min. – Max.)	39 (28 – 50)	38 (28 – 50)	39 (30 – 45)
Helkimo's index			
Mean ± SD.	3.35 ± 1.40	3.23 ± 1.34	3.53 ± 1.48
Median (Min. – Max.)	3 (0 – 7)	3 (0 – 6)	4 (0 – 7)
Deviation to the right or left			
Yes	48 (17.1%)	35 (21.9%)	13 (10.8%)
No	232 (82.9%)	125 (78.1%)	107 (89.2%)
Shift to the right or left			
Yes	34 (12.1%)	17 (10.6%)	17 (14.2%)
No	246 (87.9%)	143 (89.4%)	103 (85.8%)
Previous dental treatment extraction, operative, endo			
Yes	142 (50.7%)	84 (52.5%)	58 (48.3%)
No	138 (49.3%)	76 (47.5%)	62 (51.7%)
Habits			
Yes	73 (26.1%)	37 (23.1%)	36 (30%)
No	207 (73.9%)	123 (76.9%)	84 (70%)
Headache			
Yes	134 (47.9%)	83 (51.9%)	51 (42.5%)
No	146 (52.1%)	77 (48.1%)	69 (57.5%)
Head and neck trauma			
Yes	49 (17.5%)	28 (17.5%)	21 (17.5%)
No	231 (82.5%)	132 (82.5%)	99 (82.5%)
Stress			
Yes	158 (56.4%)	104 (65%)	54 (45%)
No	122 (43.6%)	56 (35%)	66 (55%)
Other joint pain			
Yes	37 (13.2%)	24 (15%)	13 (10.8%)
No	243 (86.8%)	136 (85%)	107 (89.2%)
Clenching			
Yes	59 (21.1%)	34 (21.3%)	25 (20.8%)
No	221 (78.9%)	126 (78.8%)	95 (79.2%)
Bruxism			
Yes	31 (11.1%)	18 (11.3%)	13 (10.8%)
No	249 (88.9%)	142 (88.8%)	107 (89.2%)
Life satisfaction			
Yes	239 (85.4%)	145 (90.6%)	94 (78.3%)
No	41 (14.6%)	15 (9.4%)	26 (21.7%)
Sleeping disorders			
Yes	68 (24.3%)	32 (20%)	36 (30%)
No	212 (75.7%)	128 (80%)	84 (70%)
Migraine			
Yes	68 (24.3%)	40 (25%)	28 (23.3%)
No	212 (75.7%)	120 (75%)	92 (76.7%)

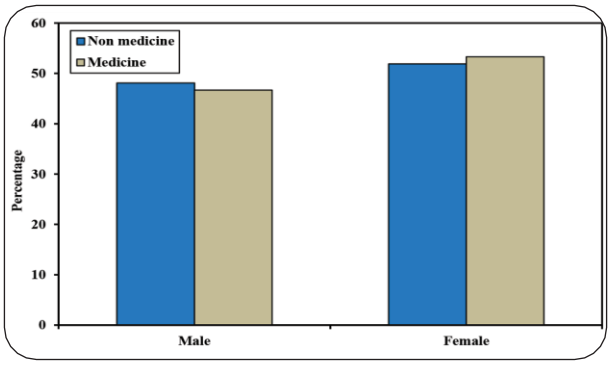

Fig. (1) Distribution of the studied cases according to sex

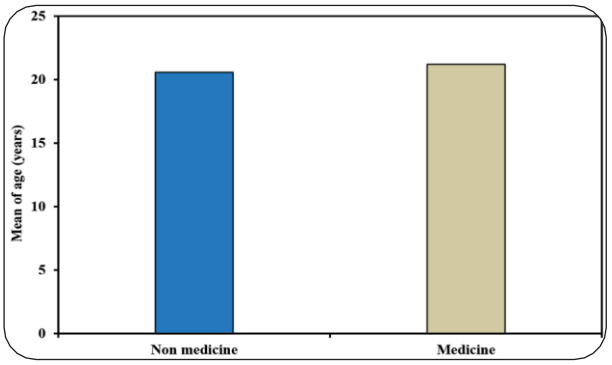

Fig. (2) Distribution of the studied cases according to age (years)

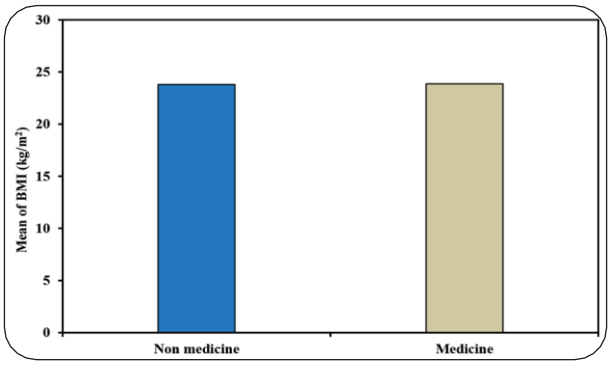

Fig. (3) Distribution of the studied cases according to BMI (kg/m2)

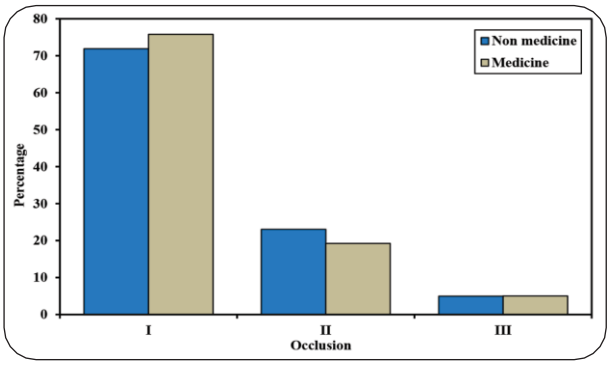

Fig. (4) Distribution of the studied cases according to occlusion

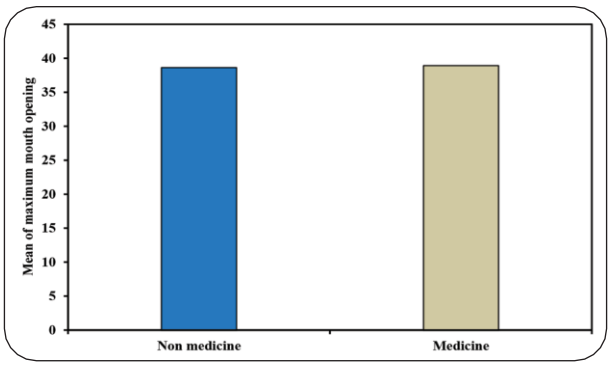

Fig. (5) Distribution of the studied cases according to maximum mouth opening

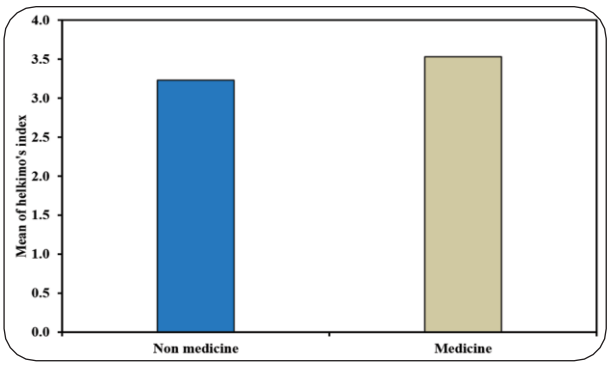

Fig. (6) Distribution of the studied cases according to helkimo's index

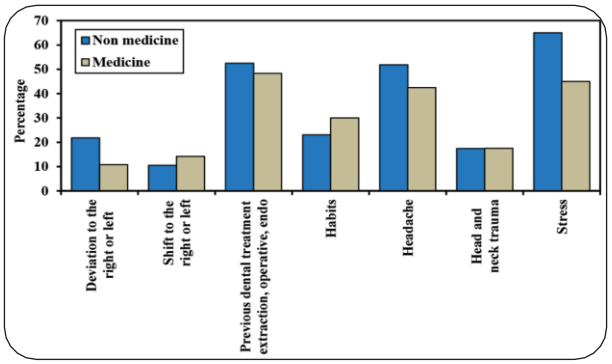

Fig. (7) Distribution of the studied cases according to different parameters

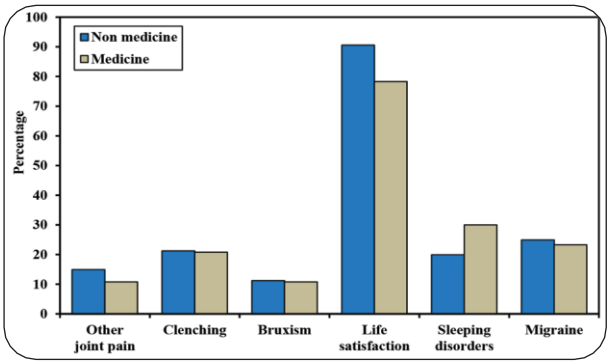

Fig. (8) Distribution of the studied cases according to different parameters

Table (2) *Correlation between Helkimo's index and different parameters*

		Helkimo's index	
		r_s	p
Under 20	**Non medicine (n=80)**		
	Age (years)	-0.033	0.768
	BMI (kg/m^2)	-0.034	0.764
	Maximum mouth opening	-0.416*	<0.001*
	Medicine (n=60)		
	Age (years)	-0.177	0.175
	BMI (kg/m^2)	-0.041	0.755
	Maximum mouth opening	-0.559*	<0.001*
Over 20	**Non medicine (n=80)**		
	Age (years)	0.169	0.133
	BMI (kg/m^2)	0.025	0.823
	Maximum mouth opening	-0.178	0.114
	Medicine (n=60)		
	Age (years)	0.099	0.450
	BMI (kg/m^2)	-0.038	0.772
	Maximum mouth opening	-0.474*	<0.001*

rs: Spearman coefficient

**: Statistically significant at $p \leq 0.05$*

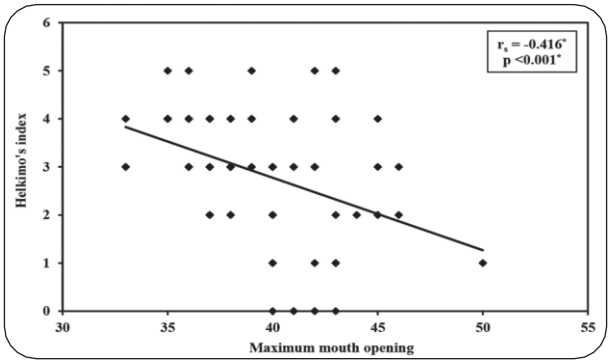

Fig. (9) Correlation between Helkimo's index and Maximum mouth opening in Under 20 in Non medicine (n=80)

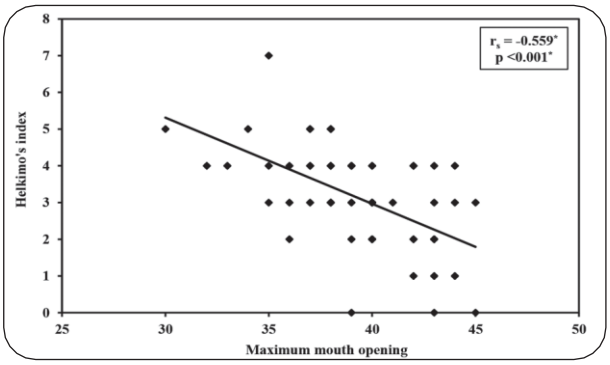

Fig. (10) Correlation between Helkimo's index and Maximum mouth opening in Under 20 in Medicine (n=60)

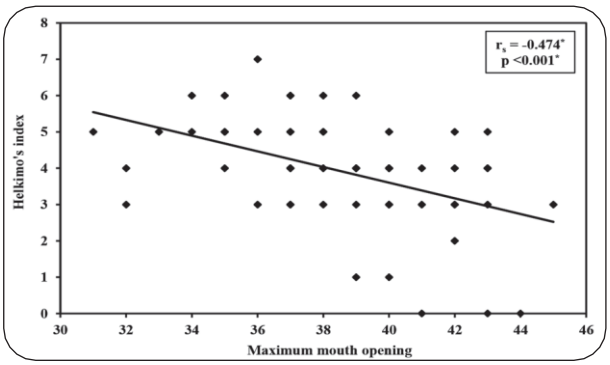

Fig. (11) Correlation between Helkimo's index and Maximum mouth opening in Over 20 Medicine (n=60)

Table (3) *Correlation between maximum mouth opening with age and BMI*

	Social demographic	Maximum mouth opening	
		r	p
Under 20	**Non medicine (n=80)**		
	Age (years)	0.022	0.849
	BMI (kg/m^2)	-0.049	0.669
	Medicine (n=60)		
	Age (years)	0.081	0.537
	BMI (kg/m^2)	0.008	0.949
Over 20	**Non medicine (n=80)**		
	Age (years)	0.051	0.656
	BMI (kg/m^2)	-0.053	0.639
	Medicine (n=60)		
	Age (years)	0.085	0.517
	BMI (kg/m^2)	0.053	0.685

r: Pearson coefficient

DISCUSSION

Temporomandibular joint disorders affect a large number of persons through multiple societies, Erroneous diagnosis of TMD has high cost, and the affected persons cannot do well in their duties and this affects the economic level of the country, So that this study was designed to reveal the prevalence of this disorder in non-patient population[16].

Through this study the temporomandibular disorders was determined using Helkimo's index because it is simple, valid and dependable according to the study of RANI ET AL [17].

Helkimo's index when recorded through this study was 3,35 and this indicates mild TMD according to [17].

There was no significant difference between medical and non-medical students as regards Helkimo's index but it is slightly higher in medical than in non-medical students although clinching, bruxism, stress recorded higher in non-medical than in medical students, but the ability of medical students to be aware of the anatomy of TMJ and determination of the problem may be higher, and this is in accordance to the study of RASHED ET AL [18].

Also, life satisfaction level was less in medical than in non-medical students also sleeping disorders were more common in medical than in nonmedical students.

clinching and bruxism through this study were more in non-medical students than medical, the clenching and bruxism indicates overactivity of masticatory muscles with subsequent pain related to the temporomandibular joint, alike to this findings , many studies shown intimate association between parafunctional habits and the events of TMD [19, 20]

Sleeping disorders was common among medical students, and those may be potent factor contributing TMD according to the study of Lee et al [21].

It was noted that the TMD is higher in females than males and this is can be explained by protective effects of testosterone hormone in males against pain , furthermore the females are more sensitive to pain and emotional stress than males according to several studies [22-26].

As regards occlusion 73%was class1 while 26 were class 2 and 5% class 3 so that this study supports the finding that there may not be a relationship between TMD and malocclusion and this finding is accordance to the literature [27].

However, Tanne et al stated that there is intimate relation between TMD and malocclusion, so that effect of mal occlusion on TMJ depends on the ability of the patient to accommodate with it [28].

Through this study about 50% of the students give a history of Previous dental treatment extraction, operative, endo however association of dental manipulation with TMD must be studied carefully and this is according to Habib et al [29] who stated that fourth of the participants suffered from moderate to severe TMD after dental manipulations.

Headache, migraine, cervical pain were different complaints of the patients throughout this study, but all these complaints may be independent on TMD, and this need further investigations.

In Correlation between Helkimo's index and different parameters there was no correlation was found between age and Helkimo's index in all groups, also there was no correlation was found between BMI and Helkimo's index in all groups (table 2).

There was significant negative correlation between Maximum mouth opening and Helkimo's index in medical and non-medical groups under 20 years (Figure 9).

There was significant negative correlation between Maximum mouth opening and Helkimo's index in medical group under 20 years (Figure 10).

There was significant negative correlation between Maximum mouth opening and Helkimo's index in medical group over 20 years (Figure 11).

There was no significant negative correlation between Maximum mouth opening and Helkimo's index in non-medical group over 20 years.

In correlation between maximum mouth opening with age and BMI (table 3), There was no significant correlation was found between age and maximum mouth opening in all groups, also, there was no significant correlation was found between BMI and maximum mouth opening in all groups.

Although this study depended on a questionnaire and was in a non-patient environment however it stimulated multiple students to be aware of TMD and seek for treatment.

CONCLUSION

TMD signs and symptoms are present in a non-patient population, and it may be misdiagnosed, more study is required with larger numbers for people to be aware of TMD and find earlier management.

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معدل حدوث اضطرابات المفصل الصدغي الفكي بين طلاب جامعة جنوب الوادي

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الملخص :

الهدف: تناولت دراستنا انتشار اضطراب المفصل الصدغي الفكي لدى طلاب جامعة جنوب الوادي. كما تم فحص معدل الاصابة باضطراب المفصل الصدغي الفكي بين طلاب كليات مختلفة لتحديد الفئات المعرضة لخطر الاصابة به.

المواد والاساليب: حصلنا على بيانات تتعلق بأعراض اضطراب المفصل الصدغي الفكي وعوامل الخطر المحتملة من خلال استبيانات مخصصة، وأُجريت تحليلات إحصائية باستخدام برنامج SPSS.

النتائج: أخذنا عينة من 280 طالبًا من جامعة جنوب الوادي. شارك في الدراسة 1cc طالبًا و147 طالبة تتراوح أعمارهم بين 18 و2c عامًا. كان من بينهم 120 طالبًا (42.9%(من طلاب الطب و1e0 طالبًا (57.1%(من غير طلاب الطب.بلغ مؤشر دراسة هيلكيمو c.c5، مما يشير إلى اضطراب خفيف في المفصل الصدغي الفكي. كان لدى طلاب الطب مؤشر هيلكيمو أعلى قليلًا (c.5c(منه لدى طلاب غير الطب (c.2c(. كان صرير الأسنان، والتوتر أعلى بين طلاب غير الطب منه لدى طلاب الطب. كان لدى طلاب الطب رضا أقل عن الحياة (78.c%(منه لدى طلاب غير الطب (90.e%(. واجه طلاب الطب (c0%(صعوبات في النوم أكثر من غيرهم (20%(. لوحظ أن الاناث يعانين من اضطراب المفصل الصدغي الفكي أعلى من الذكور. كان الانسداد بنسبة 74% من الدرجة الأولى، و21% من الدرجة الثانية، و5% من الدرجة الثالثة. خضع حوالي 50% من الطلاب في هذه الدراسة لعلاج أسنان، أو خلع، أو جراحة، أو علاج لب السن.

الخلاصة: تظهر علامات وأعراض اضطراب المفصل الصدغي الفكي لدى غير المرضى، مما يثير مخاوف بشأن احتمالية التشخيص الخاطئ. هناك حاجة إلى مزيد من البحث مع عينات أكبر لزيادة الوعي باضطراب المفصل الصدغي الفكي والمساعدة في التدخل المبكر.

الكلمات المفتاحية: مفصل الفك، اضطرابات مفصل الفك، الاضطرابات العضلية، الألم حول الفم.