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Original Article

Prevalence and Severity of Temporomandibular Joint Disorders Among Sohag University Medical Students: A Questionnaire Study

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Abstract:

Background: Temporomandibular disorder (TMD) is a description of temporomandibular joint (TMJ) dysfunction and pain with variable degrees of severity, aim of our study is to evaluate the prevalence of TMD among Sohag University medical students.

Methods: An online Google form questionnaire of two parts was used for the collection and evaluation of demographic data in the first part and Fonseca's Anamnestic ten questions in the second part, the link to the questionnaire was sent to students through social media including WhatsApp, Facebook, Telegram groups. A sample of 1130 medical students, including all academic grades with ages ranging from 17 to 32 years responded to the link. Fonseca's Anamnestic Index (FAI) and its questionnaire were used for the evaluation of the prevalence and degree of severity of TMD.

Results: The interpretation of the resulting data showed that a total of 746 students (66%) had TMD of which 422 (56.6%) were females and 324 (43.4%) were males. The FAI was used to classify participants according to severity, the results were categorized as follows; 384 (34%) with no TMD, 508 (45%) with mild degree, 198(17.5%) moderate degree, 40 (3.5%) severe degree of TMD. Females were generally more affected than males. There was a statistically significant difference between categories of TMD across gender.

Conclusion: TMD has a high prevalence among asymptomatic medical students, with the mild TMD category representing the highest prevalence among volunteers. Prevalence among females was significantly higher than for males. Our results were consistent with similar studies in the literature.

Key words: Temporomandibular joint disorders; Prevalence; Fonseca's Anamnestic index and questionnaire.

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Introduction

Temporomandibular disorders (TMD) are considered as pathologies that affect the masticatory system and temporomandibular joint (TMJ) including arthralgia, myalgia, internal derangement, osteoarthritis, and myofascial pain. It can be presented with different and similar clinical symptoms and signs that include joint pain, sounds, and limited jaw opening.(1) TMD is a multifactorial condition, different etiologies can lead alone or in combination to TMD. Among these factors, parafunctional habits, unstable occlusion, and psychological factors are the most known ones. Early recognition of TMD symptoms and signs is very important in the management and prevention of progression.(2) Screening for TMD prevalence was done first by using Helkimo anamnestic and clinical indexes in 1974, it was widely used until 1992 when Fonseca modified Helkimo's indices and developed his anamnestic questionnaire and index with 95% reliability. (3, 4)

Dworkin and Leresche proposed in the research diagnostic criteria for temporomandibular disorders (RDC/TMD) for diagnoses of signs and symptoms of TMD.(5) Schiffman in 2014 developed a new comprehensive RDC/TMD version, it has a clinical evaluation part that requires the patient's presence making its usage for epidemiological studies by telephone, internet or questionnaire inapplicable.(6) The Fonseca's anamnestic index (FAI) categorizes TMD as no, mild, moderate or severe TMD. It includes 10 questions assessing difficulty in mouth opening, moving jaw from side to side, pain during chewing, headaches, neck pain, TMJ pain, clicking, clenching, sense of malocclusion, and tense personality.[4] Fonseca's questionnaire is widely used as a low-cost, reliable, and easy method for screening TMD prevalence in non-patient populations, that can be used as a paper sheet questionnaire or through internet without the need for participant presence.(7) Reviewing the literature, several studies for screening TMD prevalence were done, and the reported prevalence ranged from 23% to 87% among university students in different countries, this difference in results with a wide range is thought to be due to different methods, populations, diagnostic criteria, and examiners variations.(8-13) This study aims to investigate the severity and prevalence of TMD among medical students at Upper Egypt University using Fonseca's questionnaire.

Materials and Methods

Our study was carried out between November 2022 to February 2023 on students of the faculty of medicine at Sohag University which is located almost in the center of upper Egypt. A Google form was developed consists of two parts; the first part included questions on demographic data and the second part included 10 questions from Fonseca's questionnaire translated into Arabic, the form was set to accept one answer for each question which is "yes", "sometimes" or "no", also all questions must be answered and only one response from each student is accepted and sent back to us. The link to the Google form was sent to students through social-media applications such as WhatsApp, Telegram, and Facebook. Information about the aim of the study questionnaire and how to answer it was sent together with the link, students were informed that answering the questionnaire is optional and response is considered consent for data usage in our research. Approval of the ethical committee of Sohag Faculty of Medicine was fulfilled.

Statistical analysis of data was done using SPSS for Windows, (version 28 IBM Corp. Armonk, NY, USA). The chi-square test was used to compare percent means between genders and severity degrees with the P-value was considered significant if less than 0.05. The received answers were transformed into values (Yes = ten & Sometimes = five & No = zero). the sum of these values was used to categorize volunteers into four groups according to FAI; students with points zero to 15 had no TMD, 20-40 had mild TMD, 45-65 had moderate TMD and > 70 points were considered severe TMD.

Results

In our study 1130 students responded to our questionnaire, 516 (45.7%) of them were males and 614 (54.3%) were females, and their ages ranged from 17 to 33 years (mean 22.28). 746 students (66%) had a degree of TMD of which 422 (56.6%) were females and 324 (43.4%) were males, the higher percentage of females compared to males shows a statistically significant difference. The FAI was used for the classification of volunteers according to the degree of severity, the results were categorized as follows; 384 (34%) had no TMD, 508 (45%) had a mild degree, 198(17.5%) had a moderate degree, 40 (3.5%) had a severe degree of TMD. According to received answers (Table 1) the most frequent yes answers were 39.9% for having a tense personality and 28.8% feel their teeth do not articulate well, and 25.8% had frequent headaches. Among 'sometimes' responses tense personality was the most frequent 33% and pain in the nape or stiff neck 30.9%. The least frequent problems were side-to-side movement of the mandible and mouth opening (No answer 90% and 83.4% respectively) (figure 1). The volunteers categorized as mild TMD were found to be significantly higher in comparison with those of severe and moderate degrees ($p<0.001$).

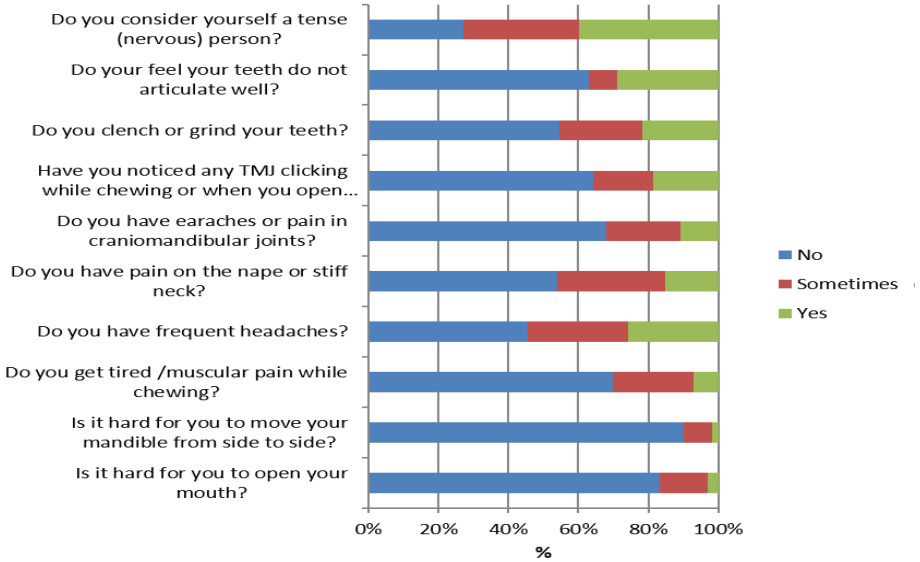

Figure 1 Bar chart for TMD questionnaire items

Table 1 Answers of 1130 participants to the questionnaire

		Number	%
Gender	Male	516	45.7
	Female	614	54.3
Is it hard for you to open your mouth?	No	942	83.4
	Sometimes	153	13.5
	Yes	35	3.1
Is it hard for you to move your mandible from side to side?	No	1018	90.1
	Sometimes	90	8.0
	Yes	22	1.9
Do you get tired /muscular pain while chewing?	No	791	70.0
	Sometimes	259	22.9
	Yes	80	7.1
Do you have frequent headaches?	No	516	45.7
	Sometimes	323	28.6
	Yes	291	25.8
Do you have pain on the nape or stiff neck?	No	608	53.8
	Sometimes	349	30.9
	Yes	173	15.3
Do you have earaches or pain in craniomandibular joints?	No	769	68.1
	Sometimes	238	21.1
	Yes	123	10.9
Have you noticed any TMJ clicking while chewing or when you open your mouth?	No	727	64.3
	Sometimes	194	17.2
	Yes	209	18.5
Do you clench or grind your teeth?	No	616	54.5
	Sometimes	269	23.8
	Yes	245	21.7
Do your feel your teeth do not articulate well?	No	714	63.2
	Sometimes	91	8.1
	Yes	325	28.8
Do you consider yourself a tense (nervous) person?	No	306	27.1
	Sometimes	373	33.0
	Yes	451	39.9

Discussion

This study aimed to assess the prevalence and severity of TMD among students of the faculty of medicine, Sohag University which is located at the center of Upper Egypt. The Fonseca's anamnestic index with its questionnaire was used for the collection and interpretation of data. It is a fast, easy, and cost-effective method for the evaluation of TMD symptoms and severity.[4] The Fonseca's anamnestic index was used in many studies, results vary due to differences in population, diagnostic criteria, and examiners. Karthik *et al* reported one of the lowest percentage of participants with TMD approximately 22.6%.[12] In another study, Rokaya *et al*. presented data that 30.6% of participants had TMD.[14] Consistently, Al Moaleem *et al.* reported 43.5% of the participants having TMD with mild degree representing 38%, moderate degree representing 4.89% and severe degree representing 0.54%.[13] Habib *et al*. and Modi *et al.* reported a TMD prevalence of 45% and 46.8% respectively.[10, 11] Nuriye reported that 47.53% of participants had variable degrees of TMD with 33.95% had mild TMD, 11.52 % had moderate TMD, and 2% had severe TMD. females were more affected compared to males.[7] The previously mentioned studies reported that more than half of the population had a degree of TMD. However, reviewing the literature, many studies reported a higher prevalence of more than half of the studied population had TMD. Bonjardim *et al*. reported 50% of the subjects with TMD but only 9.18% had moderate to severe degree.[15] Nomura *et al.* reported 53.21% of the studied subjects had variable TMD levels: 35.8% with mild TMD, 12% with moderate TMD, and 5.5% had severe TMD.[9] Among the reported studies Bevilaqua-Grossi *et al*, found to demonstrate a very high prevalence of TMD of approximately 87%.[16]

In our study, 34% of participants had no TMD and 66% had TMD, our results were consistent with Pedroni *et al* and Oliveira *et al.* as they reported that 68% of the included subjects were found to have TMD.[8, 17] FAI was used to categorize TMD according to severity into mild, moderate and severe degree which was found to be 45%, 17.5%, and 3.5% respectively. This was found to be consistent with our results, as we found mild severity degree of TMD is the most prevalent in both males and females, where the mild degree was 45.5% and 44.5% respectively. This result is consistent with reported studies.[8-11] In our study, the moderate degree was 20.2% in females and 14.3% in males, while severe degree was 4.1% in females and 2.9% in males. In mild degree, we found no significant difference between males and females, but we found moderate and severe degrees of TMD were significantly more prevalent in females (figure 2), this gender variation is common in many diseases and medical care given and found to be consistent with other studies (Table 2).[8, 9, 12, 17-19].

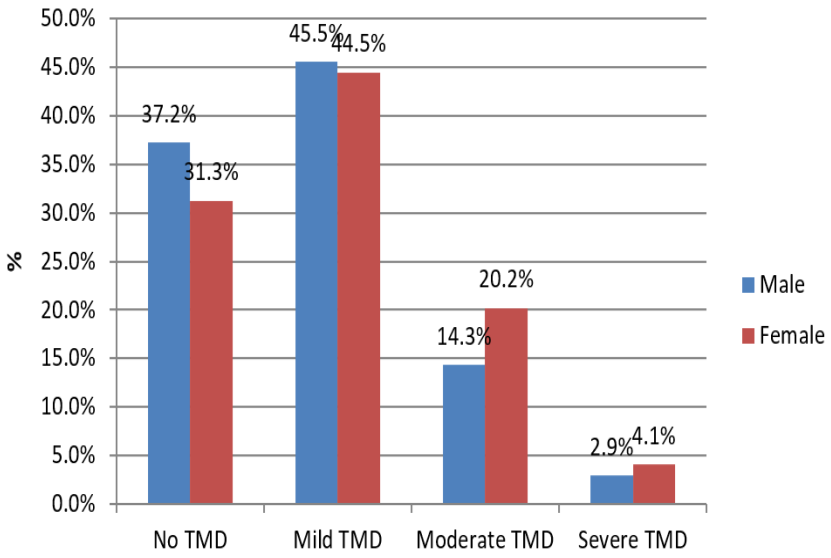

Figure 2 Bar chart for categories of TMD across gender.

Table 2 Comparison of categories of TMD across gender

Categories of TMD	No TMD	384	34.0	
	Mild TMD	508	45.0	Total 746 (66%)
	Moderate TMD	198	17.5	
	Severe TMD	40	3.5	

This can be explained by reports that females are thought to be more sensitive to pain than males and that TMJ morphology is different in females using tomographic studies also few studies suggest that receptors for female sex hormones could be detected in the TMJ cartilage in women with TMDs.[8, 20] Studies reported that females were found to self-report parafunctional habits more than males and tend to correlate between TMD symptoms and their habits, they tend to come forward and visit specialists than males.[21, 22] In this study, 451 (39.9) of students answered yes to having a tense and nervous personality with 373 (33%) answered with sometimes; this is consistent with the fact that psychological causes such as stress, anxiety and depression have an important effect in the TMD etiology. Under raised levels of emotional stress, the skeletal musculature as a whole exhibits generalized hyperfunction and has been linked to the development of hyperactivity in the muscles of mastication and increases tension relieving oral habits which causes TMD.[[23] Also, the second most reported answer with yes is a sense of malocclusion 325 (28.8%) which is considered a main cause of TMD as occlusal disharmony relates to the articular disc displacement by causing lengthening or torn of ligaments between the disc and the condyle. It also accounts for conditions that affects the normal resting position of the mandible.[24] The limitations of our study include a range of age 17-33 years, with only medical students in one university included in the study, so a more heterogenous population with a wider range of age is recommended in future studies.

Conclusions

Temporomandibular disorders prevalence is high among upper Egypt medical students with a high prevalence of mild degree. Females were generally more affected than males. Screening for TMD among university students with questionnaires is easy, cost-effective and can help early recognition of health problems. Measures to relieve stress among medical students would help in decreasing TMD prevalence.

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