

ASSESSMENT OF TEMPOROMANDIBULAR DYSFUNCTION SYMPTOMS AND EPIDEMIOLOGICAL FACTORS ON TANTA UNIVERSITY STUDENTS USING FONSECA'S QUESTIONNAIRE: A CROSS SECTIONAL STUDY

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ABSTRACT

Purpose. To estimate predominance of TMD of Tanta University students using Fonseca's questionnaire.

Materials and methods. This study was carried out between December 2019 and January 2021. It was done within students of eight faculties of Tanta University. TMDs symptoms were filled by the students and they were examined clinically to obtain the subjective symptoms of TMD by two clinicians from fixed prosthodontics Department, Tanta University. Final results were compared to Fonseca's clinical index, and the subjects were categorized according to their TMD degree.

Results. A total number of 574 students shared in the current study. 3% of the study population didn't have TMD symptoms and 33% of them had have severe TMD symptoms, with significance. Severe TMD symptoms recorded for faculty of Nursing (12.5%) as the highest value while faculty of Dentistry recorded the second highest value (5.30%). Sex and age-related TMD symptoms showed high significance ($P=0.000$). 2.6% of students suffered from severe TMDs as 2.2% males and 2.8% of females. Nervousness was the most common symptom presented in the study population (47%) and the lowest frequently reported symptom was difficulty in mouth opening (2.9%).

Conclusions. TMD is of a high predominance within students at Tanta University and its associated symptoms were frequent within students of dental and medical fields. Females showed a greater predominance of symptoms of TMD than males. Elder age groups showed higher frequency of severe TMD symptoms than younger. Nervousness showed the most common symptom within students.

KEYWORDS : TMD, Tanta University, Sex groups, Age groups.

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INTRODUCTION

Temporomandibular dysfunction symptoms (TMDs) describe a subset of orofacial pain syndromes. Such category includes matter with the temporomandibular joint (TMJ), exhaustion of the face and masticatory muscles, abnormal jaw movement, and articular noises. There are multiple factors about genesis of TMD, with the most prevalent causes being emotional stress, early occlusion, tooth missing, postural perversion, masticatory muscle dysfunction, and internal and external alterations in TMJ structure.¹⁻³

Psychosomatic, constitutional, and postural variables all contribute for the disruption of dynamic equilibrium among the three components of the stomatognathic system, which are masticatory muscles, dental occlusion and TMJ.⁴ Pain importance as a significant symptom leading to increased research into the epidemiology and etiopathogenesis of TMDs.

TMJ alterations and exacerbation of existing TMD have been connected with orthodontic therapy, orthognathic surgery, prosthodontic rehabilitation, and mandibular fractures.⁵ Due to the TMJ's innate adaptability, changing jaw posture, and mechanical stress in response to the above-mentioned therapies generate morphological changes.⁶

Epidemiology of TMDs is significant as the disorder's complex etiology, various manifestations, challenging diagnostic and therapeutic techniques, and the time required to relieve its symptoms.⁷ The predominance of symptoms varies, and TMD is diagnosed by correlating signs and symptoms.

Numerous epidemiological researches of TMDs in patient and normal populations have been undertaken. Studies indicate that 60%-75% of participants will exhibit one TMD sign and 35% will exhibit mild TMD symptoms; TMD signs are present in 50%-75% of the population at a time in their lives, as nearly 35% display minor symptoms.⁸⁻¹⁰

TMD prevalence ranges between 20% and 50%. Variation in prevalence can be attributable to variances in the population's race, the sample design and criteria, and the information collection techniques.¹¹⁻¹⁷ Screening a population for TMDs is a problem for academics and clinicians, and different TMD assessment tools have been proposed in the literature.

There is currently no uniform diagnostic criterion in place for TMD. Dworkin and Leresche² in 1992 developed the research diagnostic criteria for temporomandibular disorders (RDC/TMDs), which have been utilized in different epidemiological and clinical investigations. Schiffman and others¹⁸ in 2014 have presented a new inclusive version of RDC/TMDs, named as the Diagnostic Criterion for Temporomandibular Disorders (DC/TMD). They assert that the DC/TMD has a robust and dependable checking questionnaire as well as diagnostic algorithms for the most prevalent pain-related TMDs. In spite of their benefits, the RDC/TMD and DC/TMD are laborious evaluation methods since they require the patient to be present so as to diagnose TMD, and they are hard to apply to enormous samples.

A self-applied questionnaire containing the Fonseca's anamnestic index (FAI) has been offered as a low financial, straightforward instrument, minimal examiner influence, and reduced measure variability for the non-patient population for TMDs evaluation.^{15,19} Thus, the FAI rendered as an initial screening tool for TMD. At 2009, Campos and others endorsed those previous benefits of use of FAI in a research about the validity of utilizing a questionnaire to estimate the acuteness of TMDs.²⁰ The questionnaire gives a severity indicator,^{1,15} it consists of 10 questions that test for TMJ, head, and neck discomfort, parafunctional behaviors, mobility limits, pain during chewing, joint probing, perception of malocclusion, and mental fatigue.¹⁹

Graue et al.²¹ reported that the incidence of TMDs in females typically peaks at 16 years. The

identification of etiological variables, which prevented sample uniformity, was an inherent challenge for researchers of TMDs. To acquire and compare findings from several clinical trials on the severity of TMD, a dependable and straightforward questionnaire was required. The anamnestic and clinical indicators established by Helkimo²² in 1974 and derived from clinical data were extensively utilized. In 1992, Fonseca²³ updated Helkimo's indices and created an anamnestic questionnaire, defining TMD as mild, moderate, severe, or as nonexistent.

Particularly, TMD patients have been documented to have an elevated rate of exposure to fatigable life calamities and heightened scales of apprehension and stress-related symptoms.^{24,25} Apprehension and bleakness are the most prevalent clinical conditions in the population and are prevalent between college pupils. Academic stresses have a high effect on university students' health that shown in the literature.²⁶ Backdrop of the university is appropriate for investigating the mental health of young adults. Oftentimes, students of university endure turn shifts, as disusing family for the first time, living with other colleges, and having less parental monitoring. These alterations may raise likelihood of bleakness.^{24, 26}

This study assessed the acuteness of TMDs among undiagnosed undergraduate students from eight different faculties at Tanta University by the aid of Fonseca's questionnaire integrated with clinical examination of the students. The null hypothesis of this study was assuredness that the psychic stresses leading to TMD symptoms.

MATERIALS AND METHODS

Subject selection

The total sample size in the current study is 574 students (171 males, 403 females, age range 17-30), the sample is collected from eight Faculties in Tanta university which are [Dentistry, Medicine,

Pharmacy, Science, Nursing, Education, Commerce and Arts]. The significance level was 0.05 and the power sample size was 95% using a computer program G Power version 3.

$$\text{sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

The formula of sample size:

Where [N=Population size, e= Margin of error (percentage in decimal form), z= z-score]

The z-score is the number of standard deviations a given proportion is away from the mean. Power analysis was represented in Figure 1.

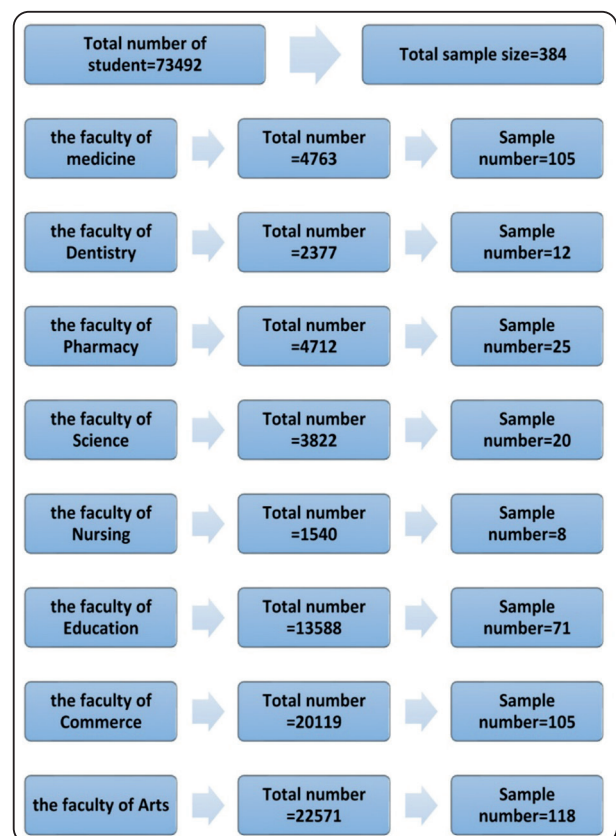


Fig. (1) Flowchart of the power analysis of the study

The current study was carried out between December 2019 and January 2021 via Fonseca's questionnaires. Ethical approval was obtained

from the Institutional Ethics Committee, Faculty of Dentistry, Tanta University and the subjects were required to sign an informed consent before their participation in the study. Information about TMDs was explained to all the participating subjects and they were examined clinically to obtain the subjective symptoms of TMD by two clinicians from fixed prosthodontics Department, Tanta University.

Inclusion criteria

1. Students of faculties of Tanta University.
2. Both males and females.
3. Age range from 17 to 30.
4. Students signed an informed consent.

Exclusion criteria

1. Students with previous history of TMDs like: trigeminal neuralgia, burning mouth syndrome, migraine, neuropathic pain and those who had previous TMD treatment.
2. Students didn't sign the informed consent.
3. Students with history of orthodontic treatment.

Questionnaire

A questionnaire created by Fonseca²³ was utilized to assess the prevalence of TMD among pupils. It consisted of 10 questions and conformed to the features of a multidirectional assessment. As instructed, the volunteers responded with "yes," "no," and "sometimes" and indicated only one response for each question.

Data analysis

Findings were examined utilizing the given data's frequency division. Fonseca questionnaire is an anamnestic index that identified respondents as mild, moderate, severe TMDs, or not existent.

"yes," "no," and "sometimes" responses from each questionnaire were counted and multiplied by the value assigned to each response, ten, five,

and zero, respectively. Final result was compared to Fonseca's clinical index "in Table 1", and the subjects were categorized according to their TMD degree.

Statistical analysis was performed using SPSS for Windows release 14.0 (SPSS Inc., Chicago). Differences at the 5% level were accepted as being statistically significant.

RESULTS

The current study included 574 students (171 males and 403 females, ages 17 to 30). 3% of the study population had no TMD symptoms. Concerning the presence of TMD symptoms, 41% of the students had mild TMD symptoms, and 23% had moderate TMD symptoms. 33% of them had severe TMD symptoms (Figure 2). TMD symptoms were compared between eight faculties of Tanta University and there was significant difference where ($P=0.000$). 50% of Nursing faculty students had no TMD symptoms; on the other hand, all of the Education faculty pupils experienced TMD to varying degrees. The percentage of students with mild TMD symptoms was greatest in the Arts faculty (50.4%) and lowest in the Education faculty (28.4%). The faculty of Education had the greatest percentage of moderate TMD symptoms (71.6%), the faculty of Commerce had the lowest percentage (13.6%), and the faculty of Nursing had the lowest percentage (0%) of moderate TMD symptoms. Nursing faculty had the greatest percentage of severe TMD symptoms (12.5%), while Education, Medicine, Pharmacy, and Science all had zero percent of these symptoms. The faculty of dentistry reported the second-highest value of severe TMD symptoms (5.30%), followed by the faculty of commerce (4.90%).

When compared side by side, regardless of age or the tested faculties, sex-related TMD symptoms revealed a highly significant difference ($p=0.000$). 37% of male students and 31.70% of female students

had no TMD symptoms. 40% of students who had mild TMD complaints were male (50%) and female (37.1%). Conversely, Students with moderate TMD symptoms included 23.2% as 10.9% males, and 28.4% of females. Only 2.6% of students had severe TMDs, compared to 2.2% of male and 2.8% of female.

When compared side by side, regardless of sex or the tested faculties, age-related TMD symptoms revealed a highly significant difference (p=0.000). No TMD symptoms were present in the 17–22 age group (30.9%), whereas they were in the older group (23) (56.10%). Moderate TMD symptoms were more prevalent in younger age groups (17 to

22) (41.5%) than in older age groups (23 and older) (35.1%). While the older cohort (those over 23) had a 3.50% prevalence, the age group (17–22) had a 25.20% prevalence of moderate TMD symptoms. Only 2.30% of students in the 17–22 age range had severe TMDs, compared to 5.30% of those over 23.

Table 2 expand on the prevalence of TMD. The most prevalent symptom reported by research participants was nervousness (47%), followed by TMJ clicking while chewing or opening the mouth (29.5%), teeth clenching (20.9%), and earaches (19.4%). The most commonly reported symptom was difficulty in mouth opening, which was reported as occurring in 8.8% of cases.

TABLE (1). z-score and desired confidence level

Desired confidence level	z-score
80%	1.28
85%	1.44
90%	1.65
95%	1.96
99%	2.58

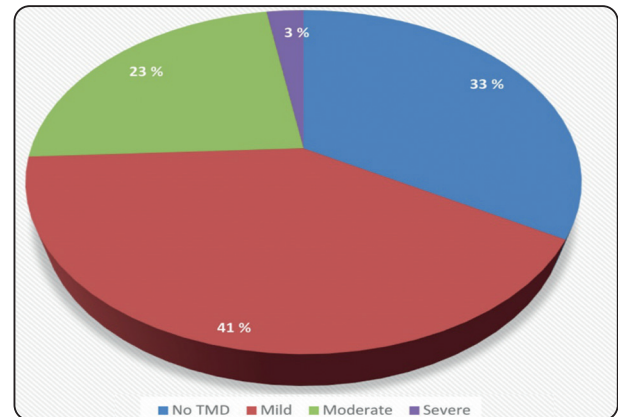


Fig. (2). Pie chart of temporomandibular disorder score distribution

TABLE (2). Response of participants to Fonseca’s questionnaire (N=613)

Questions	Yes	Sometimes	No
	N(%)	N(%)	N(%)
Is it hard for you to open your mouth?	18(2.9%)	115(18.8%)	480(78.3%)
Is it hard for you to move your mandible from side to side?	33(5.4%)	42(6.9%)	538(87.8%)
Do you get tired /muscular pain while chewing?	75(12.2%)	135(22%)	403(65.8%)
Do you have frequent headaches?	101(16.5%)	200(32.6%)	312(50.9%)
Do you have pain on the nape or stiff neck?	83(13.5%)	175(28.5%)	355(57.9%)
Do you have ear aches or pain in Cranio-mandibular joints?	119(19.4%)	151(24.6%)	343(56%)
Have you noticed any TMJ clicking while chewing or when you open your mouth?	181(29.5%)	72(11.7%)	360(58.7%)
Do you clench or grind your teeth?	128(20.9%)	164(26.8%)	128(20.9%)
Do your feel your teeth do not articulate well?	54(8.8%)	90(14.7%)	469(76.5%)
Do you consider yourself a tense (nervous) person?	288(47%)	205(33.4%)	120(19.6%)

DISCUSSION

The goal of this research was to use the frequency distribution of information collected from a questionnaire to ascertain the prevalence of TMD signs and symptoms among students from different colleges at Tanta University. The Fonseca's questionnaire was used in this research because it allows for the quick and efficient collection of a large amount of data. It is very easy to understand and has little effect on the data analyzer used by the detective.

The frequency of TMDs based on FAI varies between published studies. 67% of the participants in this study had mild, moderate, or serious TMD, according to the FAI. This incidence falls within the 42-68% range of prior researchers' estimates of FAI-based TMD predominance.^{1,12,15,27,28}

Mild TMD was the category that participants in this research reported having the most frequently (41%). Similar studies using the Fonseca's questionnaire on samples of Brazilian and Indian college students were carried out by Khan et al.²⁹, Pedroni et al.³⁰, and Karthik et al.³¹.

In this research, female students had roughly a twofold higher prevalence of moderate and severe TMDs than did male students. Research studies by Graue et al., Shiau and Chang, Karthik et al., Solberg et al., and Klineberg et al.^{21,27,31-33} support the earlier results. Female may experience this more frequently because of physiological factors like frequent hormone fluctuations, unique connective tissue properties, and different muscular structure.^{30,34,35}

Additionally, it was discovered that 41% of both male and female participants had moderate TMDs. The results from others agree with those of Pedroni et al.,^{29,31} Khan et al.,²⁹, and Karthik et al.³⁰

According to the current results, younger students are more likely to have TMD pain, which decreases with advancing age. These previous results are in accordance with the results of Osamu et al.³⁶, Nilsson et al.,³⁷ and Salonen et al.,³⁸. This might be due to the high psychological stresses and depression among younger students in this study.

Contrary, these results are not coincided with the previous studies of Sayed et al.,³⁹ and Gesch et al.,⁴⁰. The disagreement among the previously reported studies may be related to sample size or its demographic distribution.

Stress's emotional effects on the chewing musculature have been studied. When someone is under emotional duress, their teeth may clench, altering the blood flow in their masticatory muscles or pressing on their pain receptors as a result of fluid buildup in their muscles.⁴¹ Parafunctional behaviors were among the most important causes of TMDs.^{42,43}

Dental experts once believed that the development of TMDs was closely linked to occlusion. Occlusion was not the most common cause of TMDs, according to Karthik et al.,³¹ and Badel et al.,⁴⁴ which demonstrate that there is little scientific evidence to support this trend. However, an important part of teeth restorative therapies involves replacing or modifying lost or damaged occlusal relations. Any occlusion issue caused by dental work led to greater muscle spasm and discomfort, which in turn helped with TMJ. Depending on how serious the occlusal problem was, this malocclusion might result in a TMD.

Among all faculties, Nursing faculty had the highest incidence of severe TMD symptoms (12.50%), and Dentistry faculty had the second-highest prevalence (5.30%). The nature of study in these medical and dental schools, along with high stress levels and challenging coursework, may be the cause of the previous findings. Incorrect posture and pressure on the neck joints while working in dental clinics can also contribute to this condition.

Severe TMD symptoms were reported by Commerce faculty students in the current study (4.90%), and the greatest level of medium TMD symptoms was reported by Education faculty (71.60%). According to earlier findings, psychic tension levels in academic institutions were lower than those in scientific ones. These outcomes may be attributable to students' high school preparation,

which helped them achieve high grades and get into these colleges, as opposed to their desire to enroll in the best medical and dentistry schools.

The symptoms that were most frequently reported in the current research were anxiety (47%), TMJ clicking while chewing or opening the mouth (29.5%) which support the results of previous reports^{27,43}, teeth clenching recorded as (20.9%). Earaches recorded as (19.4%) which is not coincided with the study with Brazilian students³⁰, whose found that the earaches are the most common symptom. The least common symptom reported was difficulty opening the mouth (2.9%). Despite the differences in the ratios that may be caused by the difference in student numbers between the present study's (614) and these studies' (218) and (402), respectively, the studies of Habib et al.,¹⁰ and Karthik et al.,³¹ supported these findings.

Limitations of this study were that the Fonseca's questionnaire and clinical index has been used to assess prevalence and severity of TMDs, it does not serve for diagnosis and classify of TMD. The result given through using of this index are limited to the identification of the severity of signs and symptoms of TMD. Future prospect of this study was that this degree of severity of TMDs which was detected according FAI and clinical examination of pupils will help in accurate diagnosis and treatment planning of TMDs cases for better management, especially in students of medical and dental schools.

CONCLUSIONS

According to the study's results, the following conclusions were made:

1. TMD is highly prevalent among Tanta University students, and its symptoms are frequently experienced by dentistry and medical students.
2. Females outnumbered males in the prevalence of TMD symptoms.
3. Older age groups exhibited more severe TMD symptoms than lower age groups.

4. The most prevalent symptom among students were anxiety. It is advised to conduct longitudinal studies to determine the prevalence of TMD patients and their medical requirements.

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