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# Assessment of TMD in Orthodontic Patients Using Fonseca's Questionnaire

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## *Abstract*

***Objective:*** *The aim of this study was to assess the prevalence and severity of Temporomandibular Disorders (TMDs) among Omani orthodontic patients and to determine the association of skeletal relationship with the TMDs.*

***Materials and Methods:*** *A group of 103 Omani orthodontic patients with the age group ranged between 12-35 years who attended the orthodontic department at Oman Dental College (ODC) were assessed by using Fonseca's questionnaire. The patients were asked to fill out a digital Fonseca's questionnaire, which contains a series of 10 questions. The collected data were critically evaluated and subjects were rated according to the calculated scores.*

***Results:*** *According to the severity of TMD based on Fonseca's questionnaire, 1.9 % of the participants appeared with no TMD. 46.6% were classified as having mild TMDs. About 51.5 % of the participants had a moderate form of TMDs and none of the participants had severe form of TMDs.*

*Around 41.5% and 58.5% of males and females respectively were classified as having moderate TMDs.*

*There was a significant association found between skeletal relationship and degree of TMDs.*

***Conclusion:*** *The study concluded that the prevalence of TMD is more in females when compared with males. In addition there is an association between skeletal relationship and the presence of TMD.*


***Keywords:*** *Fonseca's Questionnaire, Temporomandibular Disorders, Malocclusion, Orthodontics, Oman Dental College (ODC)*

## Introduction

TMD is a collective term and known as a common orofacial pain condition which consists of a wide variety of sign and symptoms. In the orofacial region, TMD is considered one of the most common causes of non-odontogenic pain. Clinical problems involve pain in temporomandibular joint (TMJ), the periauricular area, or muscles of mastication; TMJ noises (sounds) during mandibular function; and deviations or restriction in mandibular range of motion.**[**1**]**

The etiology of TMD is usually considered multifactorial. Untreated malocclusions, unstable occlusion, stress and other psychological factors, trauma, individual predisposition, and structural conditions have been suggested as possible etiologic factors. According to many studies published in different countries, TMD has shown a high prevalence in the populations. **[**2**]** Although the prevalence of such problems is high, recent studies show that the actual need for treatment is still uncertain as symptoms are episodic and self-limiting in majority of the cases.

There are many epidemiologic studies which have been published in order to understand prevalence of TMD among children and adolescents from different populations, many utilizing a wide range of assessment and measurement methods. Studies showed that TMD prevalence varied from 9.8 to 80 %. 2 Different estimations and reports on TMDs is mainly because of the lack of international standards, different kinds and qualities of examination. **[**1**]** Prevalence and etiology of TMD remain challenging topics, although they have been studied for more than 50 years. **[**7**]**

The relationship between TMD and type of malocclusion is highly debatable. Most of the studies that have attempted to observe the possible relationship between dental occlusion and TMD have failed to provide a sufficient differentiation. **[**4**]** Studies showed that there is a lack in research data on the relationship of active orthodontic treatment and TMD. However, it is crucial to know the present level of TMD before beginning orthodontic treatment.

No studies have been reported on the prevalence and severity of TMDs among Omani orthodontic patients. For TMD diagnosis, several instruments have been reported in the literature. However, there is no universal diagnostic criterion. TMD (RDC/TMD was introduced by Dworkin and LeResche6 in 1992 and is commonly used to investigate TMD and maxillofacial pain. It classifies the interaction between the physical and psychological measurements of the chronic pain. It consists of a double axis system; Axis I which is composed of the physical diagnosis of TMD and provides a reliable measurement of TMD signs and symptoms, and Axis II, which is related to the psychological and psychosocial factors associated with TMD. **[**6**]**

However, the use of RDC/TMD as a screening tool can become impractical in great epidemiological studies, since the presence of the individual is required for TMD diagnosis and it depends on the interview technique as well. **[7]**

Therefore, simple self-administered anamnestic questionnaires that can be widely applicable and offers a faster application with low cost have been proposed by Da Fonseca et al. The Fonseca's anamnestic index (FAI) Figure 1 is highly efficient in obtaining epidemiological data and is generally utilized by researchers for epidemiologic surveys. It serves as a preliminary TMD screening tool. A complete clinical examination and additional diagnostic tools are required after recognizing the affected population.

| Numbers | Questions |
|---|---|
| 1 | Do you have difficulty opening your mouth wide? |
| 2 | Do you have difficulty moving your jaw to the sides? |
| 3 | Do you feel fatigue or muscle pain when you chew? |
| 4 | Do you have frequent headaches? |
| 5 | Do you have neck pain or a stiff neck? |
| 6 | Do you have ear aches or pain in that area (TMJ)? |
| 7 | Have you ever noticed any noise in your TMJ while chewing or opening your mouth? |
| 8 | Do you have any habits such as clenching or grinding your teeth? |
| 9 | Do you feel that your teeth do not come together well? |
| 10 | Do you consider yourself a tense (nervous) person? |

**Figure 1:** Fonseca's Questionnaire

**Aims and Objectives**

**The aims of this study were**

1. To assess the prevalence and severity of TMDs among Omani orthodontic patients in the age group 12-35 by using Fonseca's questionnaire.
2. To determine the association of skeletal relationship with the TMDs.

## Material and Methods

### Study design

The study was conducted at Oman Dental College, Muscat, and Sultanate of Oman. Considering 9.64% margin of error, 95% confidence interval, and a sample size of 383 was recommended for the study. Random sampling method was used to select the sample participants. The statistical software used was SPSS 21.0

A total of 103 Omani orthodontic patients who attended Oman Dental College were evaluated between the period of May 2019 and February 2020. The participants were asked to fill out a digital Fonseca's questionnaire during their orthodontic visit. Brief information about the study was given to the participants and a verbal consent was obtained.

Inclusion criteria included all Omani patients in the age group ranging between 12–35 years who attended to ODC orthodontic clinic with no previous history of orthodontic treatment. Exclusion criteria for the study group included patients having history of neurological or musculoskeletal disorders, history of TMJ trauma or treatment, immunocompromised and syndromic patients.

### Data collection

FAI is composed of 10 questions that investigate about the presence of most common TMD symptoms. A score is given according to the answers. Participants were informed to choose only one answer. The answers, "Yes", "Sometimes" and "No", were given the scores of 10, 5 and zero, respectively. Depending on the total score, the participants were classified as the following TMD catego¬ries: Absent (0 to 15 points), Mild (20 to 40 points), Moderate (45 to 60 points) and Severe (70 to 100 points). **[**5,7**]**

The data was calculated and according to the results, participants were evaluated as non TMD, mild TMD, moderate TMD or severe TMD. In order to evaluate the effectiveness of Fonseca's questionnaire, data were cross referenced with existing literatures.

The values were compared between males and females, different types of skeletal relationship and presence of TMDs. There was a 9 month period for data collection.

The anticipated outcome of this study would be to determine if Fonseca's questionnaire can be used on routine basis to effectively screen orthodontic patients for TMD.

## Results

The data was computed and analyzed. To test the statistical significance, Chi square analysis was used. P value less than 0.05 was considered statistically significant. Table 1 shows the distribution of participants based on gender. There was a total of 45 male participants and 58 female participants. Independent t test was applied and it showed that there was no statistically significant difference between male and female. Table 2 represents the severity of TMD based on Fonseca's questionnaire among the participants. Around 1.9% had no symptoms of TMDs. However, 64.6 % were classified as having mild TMDs. About 51.5% of the participants had a moderate form of TMDs and there was no severe form of TMDs within the participants in this study.

Table 3 represents the presence and the severity of TMDs based on Fonseca's questionnaire in male and female population. The result showed that around 43.8% of males and 56.2 % of females had mild degree of TMDs. Around 41.5% and 58.5% of males and females respectively were classified as having moderate TMDs. The difference was found to be statistically significance.

Table 4 represents the association of skeletal relationship with TMDs in male and female population. Chi square test was used and a significant association was found between skeletal relationship and degree of TMDs.

| GENDER | N | Mean | Std. Deviation | t | p |
|---|---|---|---|---|---|
| MALE | 45 | 40.55 | 11.39289 | -1.1 | 0.2 |
| FEMALE | 58 | 42.75 | 8.17422 | | |

*Test Applied-Independent t test.*

*Inference-No statistically significant difference between male and female*

**Table 1:** Distribution based on gender

| Severity | N | % |
|---|---|---|
| NO TMD | 2 | 1.9 |
| Mild | 48 | 46.6 |
| Moderate | 53 | 51.5 |
| Severe | 0 | 0% |
| Total | 103 | 100.0 |

**Table 2**: Severity of TMD

| GENDER * TMD Crosstabulation | | | | | | |
|---|---|---|---|---|---|---|
| | | | TMD | | | Total |
| | | | NO TMD | MILD | MODERATE | |
| GENDER | MALE | Count | 2 | 21 | 22 | 45 |
| | | % | 100.0% | 43.8% | 41.5% | 43.7% |
| | FEMALE | Count | 0 | 27 | 31 | 58 |
| | | % | .0% | 56.2% | 58.5% | 56.3% |
| Total | | Count | 2 | 48 | 53 | 103 |
| | | % | 100.0% | 100.0% | 100.0% | 100.0% |

**Table 3:** Prevalence and severity of TMD based on the gender

| SKELETAL MALOCCLUSION | | TMD | | | Total |
|---|---|---|---|---|---|
| | | NO TMD | MILD | MODERATE | |
| CLASS I | N | 3 | 37 | 37 | 77 |
| | % | 100.0% | 78.7% | 69.8% | 73.5% |
| CLASS II | N | 0 | 8 | 12 | 20 |
| | % | .0% | 17.0% | 22.6% | 19.6% |
| CLASS III | N | 0 | 2 | 4 | 6 |
| | % | .0% | 4.3% | 7.5% | 5.9% |
| Total | N | 3 | 47 | 53 | 103 |
| | % | 100.0% | 100.0% | 100.0% | 100.0% |
| CHI-SQUARE-51.8;p=0.0001* | | | | | |

*Test applied-Chi square test*

*Inference-significant association found between Sk. Malocclusion and degree of TMD*

**Table 4** Association of Sk. Malocclusion with TMD

## Discussion

The study represents information about the presence and the severity of TMDs among Omani orthodontic patients with the age group ranged between 12-35 years who visited ODC based on the FAI.

The result of the study showed that females were more prevalent than males in showing TMDs. This supports the results of other studies. **[**7**]**

When gender difference was analyzed, females showed more symptoms than did males. 58.5% of the females had moderate TMD and only 41.5% of the males had severe TMD.

Studies reported that the difference in TMD prevalence between males and females is still not clear. However, some theories have described why females are more affected than males. There is more frequent visit to the hospitals by females due to higher sensitivity to pain when compared with males. 6In addition female sex hormones estrogen can be a factor which is responsible for the sex related difference.

There are many opinions and controversy over the past years regarding the role of occlusion and TMD. Although there are claims that orthodontic treatment causes TMD, others claim that there is no association between orthodontic treatment and TMD. **[**8**]**

Even though orthodontic treatment can result in some changes in the patient's occlusion, the occlusion is only one of numerous factors that are related with TMD.

Studies show that there are many major etiologic factors that can be associated with TMD: occlusion, trauma, emotional stress, deep pain input, and parafunction. Patients' adaptability is other factor that has to be well investigated. **[**8**]**

In this study the skeletal relationship has been considered. The results showed that there is an association of skeletal relationship and presence of TMD. Participants with class I skeletal relationship showed 69.8% of moderate TMD. About 22.6% of class II skeletal relationship had moderate TMD. 7.5% of class III skeletal relationship had severe TMD. There was a variation of the sample size mainly for class III skeletal relationship which was less. A larger sample size is needed and there is still a need for longitudinal studies.

## Conclusion

FAI is a simple and high efficient instrument that can be used as preliminary TMD screening tool in epidemiological studies. According to FAI, different degrees of TMDs are evident in the population. This study concluded that the number of females appeared with TMDs was more as compared with males. In addition there is significant association between the skeletal relationship and the presence of TMDs.

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