

*Full Length Research Paper*

# THE INCIDENCE OF TEMPOROMANDIBULAR JOINT DISORDERS AMONG DENTAL STUDENTS IN ALJOUF UNIVERSITY, KSA

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## Abstract

This study aimed to investigate the incidence of temporomandibular disorders (TMDs) among dental students in Aljouf University, KSA. The present study included 150 dental students divided into two groups: group I (88 participants; comprised of first and second year students), and group II (62 participants; comprised of third and fourth year students). Data about the signs and symptoms of TMD and the risk factors were collected using a printed pre-evaluation questionnaires and clinical examinations. The data was processed and analyzed using SPSS statistical software 12. A p- value of 0.05 or less was considered significant. From the pre-evaluated questionnaire, it was found that the students with TMDs (positive cases) were 31 students. The group I showed increased TMD incidence, 19 (61.3%), compared to group II 12 (38.7%). The most prevalent TMD among the students was MPD, which was diagnosed in 15 cases, comprising (58%) of the total positive cases. On the other hand, the most prevalent TMD signs and symptoms were TMJ sounds, para-functional habits, facial and jaw pain and pain in movement of the mandible. The most prevalent TMD clinical findings were clicking, impaired TMJ function, impaired range of mandibular movement and TMJ pain. The occlusion derangement was most common in the form of deep bite, crowding and irregularities between teeth. TMD revealed a high incidence among dental students in Aljouf University, KSA, which can be related to the role of stress and occlusal abnormalities in the developing and/or progression of TMD. The findings of this study were giving alarm to identify risk factors associated with TMD in order to establish measures for prevention and treatment.

**Keywords:** Incidence, Tempopromandibular joint, Temporomandibular joint disorders, Malocclusion.

## INTRODUCTION

The temporomandibular joint disorders (TMD) and other orofacial pain conditions represent significant important health problems. They include a number of clinical conditions that involve the temporomandibular joint, the masticatory musculature and associated structures or both. The TMJ pain or dysfunction, TMD include internal derangement, osteoarthritis, chronic recurrent dislocation, ankylosis, neoplasia, and infection (Metemnd,

1997; De Sena et al., 2013; Soukaina et al., 2009).

The etiology of the TMJ pain or dysfunction remains controversial and is generally viewed as multifactorial. Nevertheless, many studies have implicated occlusal interferences and psychological factors as more important than other variables in providing explanation for TMD ((De Sena et al., 2013; Otuyemi et al., 2000).

Epidemiology is the study of the incidence, distribution, and determinants of diseases in human population to identify their causes and ultimately leads to prevention. One of the principle aims of epidemiology is to establish the causes of the diseases. In epidemiology, a factor associated with the disease is etiological when a

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change in intensity or frequency of that factor in a population leads to a change in the frequency of the disease. If there is association between a disease and a factor, it must be either causal or due to bias (Lambert et al., 1997; Poveda Roda et al., 2007).

Epidemiology studies can be descriptive or analytic. Descriptive investigation usually involves retrospective evaluation of the number of the cases with any diseases or associated factor. These findings are reported as prevalence. Analytic investigation usually involves prospective longitudinal evaluation of the number of cases acquiring a disease or an associated factor over specified time. These findings are reported as incidence (The American Academy of orafacial pain, 2009).

Based on the studies in non-patient population, the clinical examination consistently detected more signs of TMD than does patient self-report. In fact, the clinical examination estimates the frequency of TMD almost twice as often as the patient self-reports of symptoms of TMD- given these facts, in the absence of patient complaint, it is important to document signs of TMD but proceed cautiously with treatment of the condition itself (Raymond, 2006; Nilsson et al., 2007).

Painful disorders involving (TMJ) and associated soft tissues are relatively common with prevalences ranging from 16-59% for reported symptoms and 33-86% for clinical signs<sup>1</sup>. Approximately 25% of those individuals experiencing TMJ pain will eventually seek treatment. A strong female preponderance (as high as a 9:1 female/male ratio) has been observed in studies of patients who seek treatment for painful TMD. Recent studies have implicated estrogens in the pathogenesis of some degenerative TMJ diseases and in joint nociception, providing some explanation for the apparent female predisposition to these TMD 3-10. Estrogen receptors have been identified in tissues of primate and human TMJs (Milam, 2003)

Signs and symptoms of TMD observed in childhood increase in frequency and severity beginning in the second or third decade of life, results that have been reported in both cross-sectional and longitudinal studies. the prevalence of non-specific measures of the overall symptom level (e.g., Helkimo incidence) in non-patient survey of adults was almost equal in men and women and younger populations. In contrast, when individual symptoms were evaluated separately, women were found to have more headache, TMJ clicking, TMJ tenderness, and muscle tenderness than men. TMDs are often remitting, self limiting, or fluctuating over time, as suggested by recent patient studies (The American Academy of orafacial pain, 2009).

## MATERIALS AND METHODS

This study included dental students at the faculty of

Dentistry, Aljouf University, KSA with age range between 17 and 25 years and all were young males to evaluate the incidence of temporomandibular joint disorders (TMDs).

The study began with a printed pre-evaluation questionnaires, which were given to 150 dental students (88 students that represented group I of first and second years) and (62 students that represented group II of third and fourth years) to determine the positive cases with TMJ disorders. It contained 20 questions concerning the presence or absence of the TMDs, frequency and severity of the signs and symptoms of the TMDs, and possible risk factors related to the TMDs. The students with positive TMD signs and symptoms (i.e., positive cases) were identified and subjected to thorough clinical examination. The students were divided into 2 groups as group I represents first and second academic years so that new studying life and new system for them that had more stress on them and hence may affect on occurrence of TMD and group II represented third and fourth academic years so that these students were modified and oriented with system of study and teaching in college so that there was less stress on them and also may affect on occurrence of TMD. So the comparison was done between these two groups to see the role of stress in occurrence of TMD and also because there were not female gender in students sample .

The examination of the positive cases were done by first and second authors and included:

I-Case history

II- History of chief complain and para- function habits

III- Clinical examination

IV- Classification of T.M.J. disorders

V- radiographic examination : to classify adequately the TMDs with others examinations.

## Classification of TMDs

The positive cases were classified into MPD, internal derangement, dislocation and subluxation and fractured condyles according to clinical findings and signs and symptoms of these cases.

## Statistical Analysis

Statistical analysis was performed using S-Plus Statistical Software (SPSS) – Release 17 for Windows. A chi-square analysis (X<sup>2</sup>) was used to determine if there is significant differences exist between group I and group II. Statistical significance was achieved when the P-value  $\leq 0.05$ .

## RESULTS

The present study included 150 dental students (88

students of group I (59%), and 62 students of group II (41%). From the pre-evaluated questionnaire, it was found that the positive cases were 31 students. The group I showed increased incidence of TMJ disorders (19 (61.3%)), compared to group II (12 (38.7%)). The clinical examination was performed only for these positive cases. The most prevalent TMD among the students was MPD.

### Incidence of TMJ disorders among the students

- Myofascial–pain–dysfunction syndrome(MPD): The myofascial–pain–dysfunction syndrome (MPD) was found in 16 cases, comprising (51.6%) of the total positive cases (10 cases from group I(62.5%) and 6 cases from group II (37.5%)).
- Internal derangement: 10 cases were found to be positive regarding the internal derangement, comprising (32.3%) of the total positive cases (6group I (60%) and 4group II (40%)).
- Arthritis: The arthritis was found in four cases, comprising (12.9%) of the total positive cases (3group I (75%) and 1 group II (25%)).
- Dislocation and Subluxation: The dislocation and subluxation were found in three cases, comprising (9.7%) of the total positive cases (2group I (66.7%) and 1group II (33.3%)).

The result was not significant for all these disorders ( $p > 0.05$ ). Figure 1 and 2.

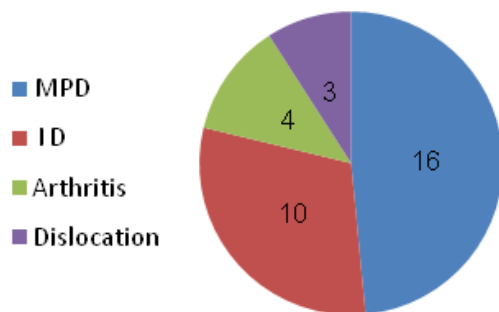


Figure 1. Distribution of TMD among Dental Students

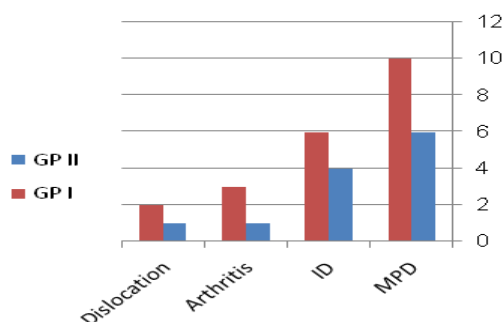


Figure 2. Distribution of TMD among Dental Students

### Signs, Symptoms and Chief Complaint

The results of the present study showed that the most prevalent signs and symptoms of TMJ disorders among dental students were TMJ sounds, para-function habits, facial and jaw pain and pain in movement of the mandible. Moreover these signs and symptoms were more common with group I. There was no statistically significant difference ( $P < 0.05$ ) between group I and group II students for all signs and symptoms. Figure 3 and 4.

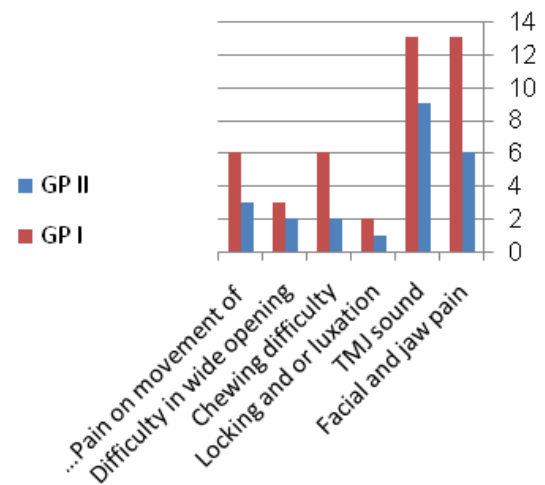


Figure 3. Signs and Symptoms

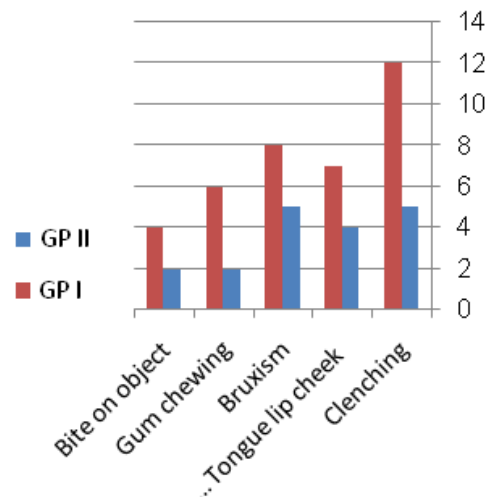


Figure 3. Parafunction Habits

### Clinical Examination

The results of the present study showed that the most prevalent clinical findings of TMJ disorders among dental students were clicking, impaired TMJ function, impaired

range of mandibular movement and TMJ pain. There was no statistically significant difference regards of all clinical findings ( $P < 0.05$ ) between group I and group II students. Figure 5.

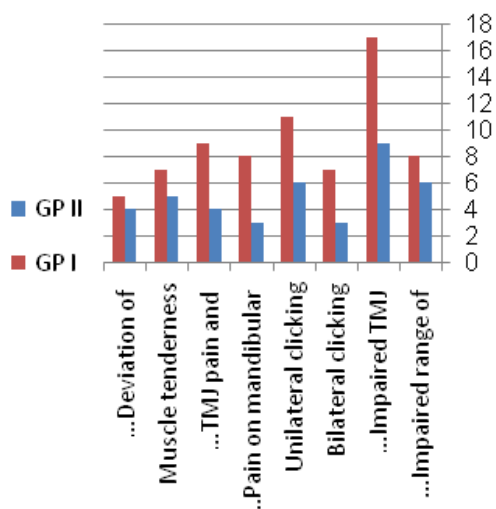


Figure 5. Clinical Findings

### Deranged Occlusion

The findings of the clinical examinations revealed that the deranged occlusions among the positive cases were 19 (61.3%) (11 group I, (57.9%) and 8 group II, (42.1%)). These occlusion derangement were most commonly in the form of deep bite and crowding and irregularity between the teeth. However, the results showed that there was no statistically significant difference as regard deranged occlusion among group I and group II students. Figure 6.

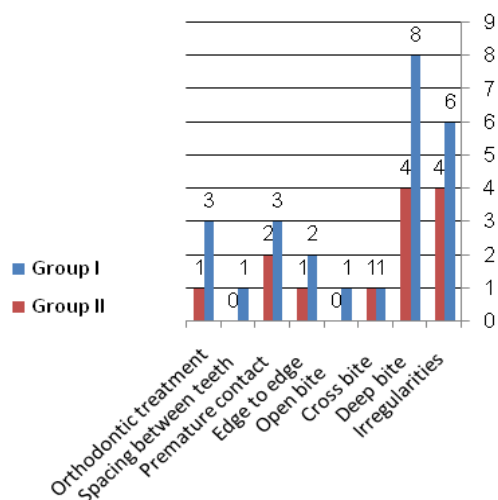


Figure 6. Occlusion Findings

### DISCUSSION

Such age range of this sample was selected to carry out this study because the signs and symptoms of TMDs appear most commonly in such young age. The incidence difference was based on grade level not on gender level.

The clinical examination was carried out only on the positive cases in order to emphasize the exact clinical findings of TMDs in such cases and to give impression for which type of the disease that the students suffered from. The fear from exams and the stresses from work and studying inside the faculty of dentistry were suggested to be a cause of this finding. The group I had myofascial pain dysfunction syndrome (MPD) more than group II because group I had psychological disturbance more than group II. These findings were similar to that reported by study done in Cairo University in faculty of dentistry by Metemad 1997 in which the females had MPD more than male by a ratio 2:1 as the stress were more in females than males. The present study revealed that The Internal derangement was the second prevalent temporomandibular disorder (TMD) among the students (10 students (32.5%)). The group I (6 students (60%)) suffered from Internal derangement (ID) more than group II (4 students (40%)) by a ratio 3:2. This finding may be attributed to the difference in psychogenic nature and parafunctional habits. This finding and its explanation in the present study were in agreement with the research done by Annika et al. 1998 in which the teenage girls were found to run a risk of development of ID three times more than teenage boys. In the present study, disc displacement with and without reduction has been suggested to be an etiology of TMJ pain and dysfunction. This suggestion was agreed with study done by Del Palomar and Doblaré, 2007 and by Gidarakou et al. 2004a; 2004b; 2003a; 2003b.

The other TMDs as dislocation and subluxation and arthritis were very few among the students.

Regarding signs and symptoms from the present study, The TMJ sound, jaw pain, pain on movement of the jaw and parafunctional habits were the most important chief complaints among the students. The TMJ sounds were the most prevalent sign in subjects. It has been suggested that uncoordinated contraction of the two heads of the lateral pterygoid muscle are responsible for the noise. The second most frequent symptoms reported was fatigue and pain felt in the jaw which may be due to parafunctional habits and emotional stress. group I had more signs and symptoms and chief complaint than the group II. These results from the present study were in agreement with many researches done by Goulet et al. 1995; Chuang, 2002; Yamada et al. 2001. The type of symptoms and the frequency of TMDs were higher in female students than in male students and jaw click was the most common

finding both in male and female dental students. The difference in reported problems between male and female students centred on a dentition factor in males and a psychological factor in female students.

The oral parafunctional habits were reported in more than 54% of the positive cases and were predispose factors in development of TMDs. The clenching and bruxism were the most prevalent oral parafunctional habits among the students. This was due to the stresses that the students face during their study. It was in agreement with the research done by Chuang, 2002 and Yamada et al. 2001. The results suggested that bruxism and clenching might be related to deterioration of the temporomandibular joint and that the greater the number of parafunctional habits a subject has, the higher the risk of condylar bony change.

The present study revealed that the clenching and bruxism did not lead to increasing levels of pain and tenderness in masticatory muscles. Thus a vicious cycle was not initiated by short term loading of healthy muscles without pre-existing pathology. This was in agreement with study done by Peter and Lars, 1996.

With respect to the clinical examination from the present study, it was observed that the most prevalent findings that the students suffered from were respectively clicking, impaired TMJ function, TMJ pain and tenderness, pain on movement of the jaw and muscles pain and tenderness. The clicking was the most common clinical findings among the students. The clicking was the only type of the TMJ sound appeared among the students. It has been suggested to be as a result of anterior disc displacement. It was considered to be important when it is included with a group of other clinical findings helping in diagnosis of the TMDs. The muscle pain and tenderness to palpation were not so high in this study. The commonest site for tenderness was the lateral ptergoid muscle. Group I students also showed clinical findings of TMJ more than group II students. These results were attributed to psychic nature of the students, difference in habits between the students and difference in behavior of the individuals. Such findings in the present study and its interpretations agreed to many studies done by Wcholitgul et al. 1997; Stohler, 1999 and Wanman, 1995 as they all confirmed that there were strong relation between muscles pain, tenderness and TMDs. The females were more than the males to exhibit that symptom of TMDs. Table 1.

The present study showed 19 students with deranged occlusion comprising about 61.3% of the positive cases (11 group I and 8 group II). The most prevalent types of malocclusion were the deep bite, irregularities and crowding, the premature contact,

the edge to edge and cross bite and open bite. The group I had more deranged occlusion than group II.

There was a relationship between occlusion and TMD signs. However, these associations were few and mostly not very strong. It can be suggested from the present study that the deranged occlusion may be one of the basic predisposing factors in incidence of TMD but not one of the exact etiology of TMD. 8 students showed orthodontic treatment but most of them still under treatment.

It was observed from the present study that the orthodontic treatment in most of them did not exactly give relief of the signs and symptoms of TMD. This somewhat disagreed with Egermark et al. 2003, who stated that the studies on the consequences of orthodontic treatment on TMD have shown that such treatment neither increases nor decreases the risk of developing TMD later in life. But the results are not conclusive, and some recent studies have found less prevalent TMD signs and symptoms in subjects who have received orthodontic treatment, compared with orthodontically untreated subjects. Egermark et al. 2003, found that Subjects who have received orthodontic treatment in childhood do not run an increased risk of developing signs or symptoms of TMD later in life.

Also they stated in another research that it was found that the low incidence rate manifest TMD in the orthodontically treated subjects, suggests that there is no elevated risk for developing TMD after orthodontic treatment thus corroborating several previous reviews and studies (Gidakou et al., 2004). The deranged occlusion findings and orthodontic treatment and their relations to TMD in the present study were similar to the study done by Gesch et al., 2004; Olof Mohlin et al., 2004; Demir et al., 2005a,b; Thilander et al., 2002 and Conti et al., 2003. As they made sure that the malocclusion and wrong orthodontic treatment played a big role in developing TMDs.

## CONCLUSION

The emotional stress, differences in family history, age, oral parafunctional habits and occlusal abnormalities appear to play an important role in the etiology of the temporomandibular joint disorders. Therefore, the need still exist for the conduction of more researches to the incidences of TMDs and its etiological factors in different population, age groups, social categories and occupations. Reducing stress among undergraduate students should remain a priority among public health interventions to allow them attain a competent health.

**Table 1.** All Findings among Dental Students in Regards of TMD

		Finding	Group				p-value
			Group I		Group II		
			Count	%	Count	%	
TMJ disorders	MPD	10	52.6%	6	50.0%	0.886	
	ID	6	31.6%	4	33.3%	0.611	
	Arthritis	3	15.8%	1	8.3%	0.493	
	Dislocation	2	10.5%	1	8.3%	0.672	
	Facial and jaw pain	13	68.4%	6	50.0%	0.258	
	TMJ sound	13	68.4%	9	75.0%	0.511	
	Locking and or luxation	2	10.5%	1	8.3%	0.672	
Signs, symptoms and chief complain	Chewing difficulty	6	31.6%	2	16.7%	0.313	
	Difficulty in wide opening	3	15.8%	2	16.7%	0.658	
	Pain on movement of mandible	6	31.6%	3	25.0%	0.511	
	Clenching	12	63.2%	5	41.7%	0.242	
	Tongue lip cheek nail biting	7	36.8%	4	33.3%	0.577	
	Bruxism	8	42.1%	5	41.7%	0.981	
	Gum chewing	6	31.6%	2	16.7%	0.355	
	Bite on object	4	21.1%	2	16.7%	0.574	
	Impaired range of movement	8	42.1%	6	50.0%	0.667	
	Impaired TMJ function	17	89.5%	9	75.0%	0.281	
	Bilateral clicking	7	36.8%	3	25.0%	0.389	
	Clinical findings of TMJ disorders	Unilateral clicking	11	57.9%	6	50.0%	0.667
		Pain on mandibular movement	8	42.1%	3	25.0%	0.282
		TMJ pain and tenderness	9	47.4%	4	33.3%	0.440
		Muscle tenderness	7	36.8%	5	41.7%	0.541
Deviation of mandible movement		5	26.3%	4	33.3%	0.489	
Occlusion	Deranged Occlusion	11	57.9%	8	66.7%	0.459	
	Irregularities	6	31.6%	4	33.3%	0.611	
	Deep bite	8	42.1%	4	33.3%	0.459	
Findings of occlusion states	Cross bite	1	5.3%	1	8.3%	0.632	
	Open bite	1	5.3%	0	0.0%	0.613	
	Edge to edge	2	10.5%	1	8.3%	0.672	
	Premature contact	3	15.8%	2	16.7%	0.658	
	Spacing between teeth	1	5.3%	0	0.0%	0.613	
	Orthodontic treatment	3	15.8%	1	8.3%	0.493	

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How to cite this article: kassab M, bakry A, Salem WS (2015). THE INCIDENCE OF TEMPOROMANDIBULAR JOINT DISORDERS AMONG DENTAL STUDENTS IN ALJOUF UNIVERSITY, KSA. *Int. Inv. J. Med. Med. Sci.* Vol. 2(1): 5-11