

# Clinical characteristics of temporomandibular disorders in patients admitted to a dental school clinic in Turkey

Güzin Neda Hasanoğlu Erbasar,<sup>a\*</sup> and Cansu Alpaslan<sup>b</sup>

<sup>a</sup>Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Yıldırım Beyazıt University, Ankara, Turkey.

<sup>b</sup>Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Gazi University, Ankara, Turkey.

\*Correspondence to: Hasanoğlu Erbasar GN. (email: neda986@gmail.com).

(Submitted: 15 October 2016 – Revised version received: 26 December 2016 – Accepted: 08 January 2017 – Published online: Winter 2017)

**Objectives** This study was undertaken to observe the frequency of different diagnostic groups for temporomandibular disorders (TMDs) in patients who sought treatment for TMD in an outpatient clinic of a dental school.

**Methods** Files of patients who received a diagnosis of TMD in a period of 24 months were evaluated. Clinical and demographic data extracted from 213 patient files meeting the inclusion criteria were analyzed.

**Results** According to the classification of RDC/TMD, 100 patients were diagnosed with myofascial pain and 113 patients were diagnosed with disc displacement. Myofascial pain was the most common diagnosis among women; disc displacement with reduction (DDwR) was the most common diagnosis in men. Self-reported bruxism was reported by 59% of the patients. The amount of maximal mouth opening showed a statistically significant difference among patients with different clinical diagnoses and also between males and females ( $P < 0.05$ ). The mean visual analog scale (VAS) score was  $4.9 \pm 2.4$  in all diagnostic subgroups, and pain severity was higher in female patients but not significantly ( $P > 0.05$ ).

**Conclusion** Demographic characteristics of patients with TMD presenting to a dental school clinic in Ankara, Turkey were similar to those reported in the literature. A thorough anamnesis can provide more detailed information about parafunctional activity and sociodemographic factors and enhance accurate diagnosis.

**Keywords** temporomandibular joint disorders, myofascial pain syndromes, temporomandibular joint disc, bruxism

## Introduction

Temporomandibular disorders (TMDs) represent a heterogeneous group of pathologies affecting the temporomandibular joint (TMJ), the masticatory muscles or both. Common signs and symptoms are persistent moderate or severe pain, functional limitation of the mandibular range of motion and joint sounds. The TMDs are the most common orofacial pain conditions of non-dental origin.<sup>1</sup> The etiology of TMD is multifactorial; several biomechanical, biopsychosocial, and neurobiological factors may contribute to this disorder. Parafunctional habits, particularly bruxism often play a significant role in development of TMDs.<sup>2,3</sup>

Female predominance is remarkable in both general and patient populations as well as the prevalence peaks between 20 and 40 years of age.<sup>4,5</sup> Myofascial pain and articular disc disorders including disc displacement with reduction (DDwR) and disc displacement without reduction (DDwoR) are among the common TMDs. Patients may admit with a single disorder but also with a disorder involving multiple clinical conditions.<sup>6</sup>

Determining the structures involved and a differential diagnosis of the condition are necessary for accurate treatment planning and to avoid unnecessary treatment. A thorough history of the patient complaints and clinical examination leads to proper diagnosis. Also, knowing the characteristics of TMD patient population for specific diagnoses helps clinicians to distinguish this condition easily. Studies showed that neither dental students nor dental practitioners feel confident in diagnosis and treatment of orofacial pain and TMDs; this reveals an obvious need for continuing education.<sup>7,8</sup>

Common signs and symptoms and, specific patient characteristics according to diagnosis have been widely

documented in numerous studies.<sup>1,4-6</sup> This kind of literature contributes to a better understanding of the disorder and may provide a tool for easy diagnosis for dental students or dental practitioners as part of continuous education courses.

Variations across gender, racial and ethnic groups have been documented in TMD symptoms especially in terms of pain.<sup>9-11</sup> This study aimed to explore the characteristics of commonly seen TMDs including myofascial pain, DDwR and DDwoR among patients who sought treatment in the outpatient clinic of a dental faculty in Turkey, Ankara and evaluate the differences with other population-based studies.

## Methods

Files of the patients who received a diagnosis of TMD in the outpatient clinic of Gazi University School of Dentistry (Ankara, Turkey) between December 2010 and December 2012 (24 months) were evaluated. Clinical and demographic data of 213 patients without multiple diagnoses were included in this retrospective study. The clinical data included patient history, pain levels that had been measured using a 10-cm visual analog scale (VAS 0: no pain at all, 10: worst pain imaginable) and recordings of the maximal mouth opening measured between the incisal edges of the upper and lower central incisors at the same side using a calibrated ruler. Using the data in the files, age, gender, presence of self-reported bruxism, range of maximal mouth opening and pain levels of the patients were analyzed and compared according to the diagnosis they received.

Differences between variables were determined using Chi-square and multiple comparison tests. All data management and statistical analysis were performed using SPSS version 12.0 and the level of statistical significance was set at  $P < 0.05$ .

## Results

Age of the patients varied between 18–69 years (mean age of 30.7 years). TMDs were more common among females (80.2%) than males (19.8%) with a 4:1 female/male ratio.

According to the classification of RDC/TMD, 100 patients received the diagnosis of myofascial pain (group I) and 113 patients received the diagnosis of disc displacements (group II) with the rate of 46.9% and 53.1%, respectively. Disc displacement subgroups were as follows: 80/213 patients were diagnosed with DDwR (37.6%) and 33/213 as DDwoR (15.5%). According to clinical diagnosis, the mean age of patients was 31.1 years for myofascial pain, 29.6 years for DDwR and 31.9 years for DDwoR.

There was a statistically significant association between gender and clinical diagnosis ( $P < 0.01$ ). Myofascial pain was the most common diagnosis among women; 51.5% of the female patients and 28.6% of the male patients presented with myofascial pain. DDwR was the most common diagnosis among men; 61.9% of male patients were diagnosed with DDwR; whereas, only 31.6% of female patients received this diagnosis. DDwoR was diagnosed in 29 female patients (16.9%) and in 4 male patients (9.5%) as shown in Table 1.

The frequency of DDwR was significantly higher in university graduates than those with lower level of education. The frequency of myofascial pain was significantly higher in elementary school and high school graduates compared to university graduates (Table 2).

Table 1. Relationship of gender and clinical diagnosis

Clinical diagnosis		Gender		
		Male	Female	Total
Myofascial pain	F	12	88	100
	%	28.6	51.5	46.9
DDwR	F	26	54	80
	%	61.9	31.6	37.6
DDw/oR	F	4	29	33
	%	9.5	16.9	15.5
Total	F	42	171	213
	%	100.0	100.0	100.0

Chi-Square, 13.22; df, 2;  $P$ , 0.00; DDwR, Disc displacement with reduction; DDw/oR, Disc displacement without reduction.

Table 2. Relationship of clinical diagnosis and level of education

Clinical diagnosis		Education level			Total
		Elementary school	High school	University degree	
Myofascial pain	F	28	42	30	100
	%	51.9	58.3	34.5	46.9
DDwR	F	16	18	46	80
	%	29.6	25.0	52.9	37.6
DDw/oR	F	10	12	11	33
	%	18.5	16.7	12.6	15.5
Total	F	54	72	87	213
	%	100.0	100.0	100.0	100.0

Self-reported bruxism was reported by 59% of patients. As shown in Table 3, bruxism was more common in patients with myofascial pain (48.4%) than patients with DDwR (38.1%) and DDwoR (13.5%). No significant causal relationship was found between the presence of bruxism and the diagnostic subgroups ( $P > 0.05$ ).

The amount of maximal mouth opening showed a statistically significant difference among clinical diagnoses [ $F(2,210) = 41.60$ ;  $P < 0.01$ ]. Patients with the diagnosis of DDwoR (30.6 mm) were the most affected group, followed by myofascial pain (34 mm) and DDwR (43.1 mm), respectively (Table 4). Also, statistically significant association was found between the amount of maximum mouth opening and gender [ $t(211) = 3.47$ ;  $P < 0.01$ ]. The amount of maximal mouth opening was higher in males (41.31 mm) than females (35.84 mm) ( $P = 0.00$ ; Table 5).

In this study, the mean VAS score was found to be  $4.9 \pm 2.4$  in all diagnostic subgroups. Pain severity was higher in female patients ( $5.11 \pm 2.35$ ) than in male patients ( $4.36 \pm 2.79$ ); this difference was not significant [ $t(211) = -1.78$ ;  $P > 0.05$ ] between males and females (Table 5).

Table 3. Relationship of clinical diagnosis and self-reported bruxism

Clinical Diagnosis		Self-reported bruxism		
		None	Present	Total
Clinical diagnosis	F	39	61	100
	%	44.8	48.4	46.9
Myofascial pain	F	32	48	80
	%	36.8	38.1	37.6
DDwR	F	16	17	33
	%	18.4	13.5	15.5
DDw/oR	F	87	126	213
	%	100.0	100.0	100.0

Chi-Square, 0.96; df, 2;  $P$ , 0.62; DDwR, Disc displacement with reduction; DDw/oR, Disc displacement without reduction.

Table 4. Comparison of maximum mouth opening (mm) by clinical diagnosis groups

Clinical diagnosis	N	Mean	SD	F	P
Myofascial pain	100	34.00	7.44	41.60**	.00
DDwR	80	43.18	8.69		
DDw/oR	33	30.61	7.75		
Total	213	36.92	9.38		

\* $P < 0.05$ ; \*\* $P < 0.01$ ; DDwR, Disc displacement with reduction; DDw/oR, Disc displacement without reduction.

Table 5. Comparison of maximum mouth opening (mm) and VAS scores based on gender

Variable	Gender	N	Mean	SD	t	P value
Max mouth opening	Male	42	41.31	10.58	3.47**	.00
	Female	171	35.84	8.77		
Pain level (VAS)	Male	42	4.36	2.79	-1.78	.07
	Female	171	5.11	2.35		

\* $P < 0.05$ , \*\* $P < 0.01$ , SD: Standard deviation.

## Discussion

Age and gender characteristics of a group of Turkish adult patients presented with TMDs were similar with the results obtained in different populations.<sup>4,12,13</sup> Although the prevalence of TMD varies between the studies, it is commonly observed in individuals between the ages of 20 and 40 years. This age range can be associated with a high incidence of exposure to stressful living events at work, interpersonal relationships and financial issues.<sup>14</sup> The gender difference has been justified by several behavioral, psychosocial and hormonal factors; however, no definitive conclusion has been reached.<sup>15</sup>

With respect to RDC/TMD diagnosis, the frequency of group I disorders (myofascial pain) in the present study (46.95%) was higher than that described in the Asian (31.4%)<sup>13</sup> and the Italian cohorts (38.2%),<sup>4</sup> but was lower than that noted in the Swedish (76%) and the American (75%) populations<sup>12</sup> and, even lower than the rate reported in the Spaniards (88.7%).<sup>16</sup> Our study showed a significant association between gender and the prevalence of myofascial pain, with a female to male ratio of 7.3:1, which was far higher than that in the Italians (4.3:1)<sup>4</sup> and Asians (3.2:1).<sup>13</sup>

The diagnosis of myofascial pain predominated in female patients; only 28.6% of the male patients received group I diagnosis. Previous studies demonstrated an increased risk for the development of myofascial pain in female patients.<sup>17,18</sup>

In epidemiological cohort studies, DDwR was the second most common diagnosis among TMDs with a prevalence rates up to 42.8%; whereas, DDwoR had lower prevalence rates (0–4%).<sup>4,12,13,16</sup> The present study showed similar results for DDwR; this diagnosis was made for 37.5% of patient population. The rate of DDwoR was 15.49% and exhibited a higher frequency compared to other studies. Group II diagnosis was higher in male patients (71.4%) in our study, when compared to other cohort studies.<sup>4,13,16</sup>

We found the mean VAS score for pain to be  $4.96 \pm 2.4$ . These data are comparable with those of the Swedish ( $4.6 \pm 2.2$ ) and American ( $4.0 \pm 2.6$ ) TMD patient populations.<sup>12</sup> In a study classifying VAS scores according to intensity, 85% of patients experiencing moderate pain scored higher than 30 mm on VAS (mean: 49 mm) and 85% of patients reporting severe pain recoded over 54 mm on VAS (mean: 75 mm).<sup>19</sup> The mean VAS scores for all 3 disorders in our study corresponded to moderate pain. When evaluated according to gender, the correlation between the level of pain and gender was not significant, even though female patients reported higher pain levels. Pain perception or pain threshold is considered to be related with gender. A systematic review of experimental pain perception reported sex differences in pain perception for thermal, pressure and ischemic pains,<sup>20</sup> and did not reveal involvement of hormonal and physiological factors in both genders even though women possessed less efficient endogenous pain inhibitory systems. However, during the clinical examination of TMD patients, females have been reported to show higher level of pain on palpation.<sup>21</sup> Past

individual history considered to be influential in female pain responses.<sup>22</sup>

Mouth opening limitation is a consequence of painful mandibular movements or due to inhibition by displaced disc as indicated by the results of our study. The biggest restriction in mouth opening was found in patients with DDwoR and then in patients with myofascial pain.

When evaluated according to gender, range of mouth opening was greater in male patients. Studies demonstrated variations in the range of normal mouth opening among populations, as well as between genders with men having a greater range of mouth opening.<sup>23–26</sup> There was a restriction in mouth opening in all subgroups compared to normal values, but again this range was greater in male patients, due to the difference in baseline values.

In this study, 126 of 213 patients (59%) reported bruxism and when analyzed according to diagnosis, 48.4% of them had myofascial pain, 38.1% had DDwR and 13.5% had DDwoR. No significant clinical relationship was found between the presence of self-reported bruxism and diagnosis of a specific subgroup. Bruxism is commonly considered as a major risk factor for TMDs, but there are still many unsolved issues concerning the diagnosis of both disorders and their relationship.<sup>3,27,28</sup> The rate of bruxism was high in our study; which was similar to the prevalence reported by Manfredini and Lobbezoo,<sup>3</sup> which was approximately 60%. Also, higher rates of bruxism, approximately 80%, were reported in studies by Pargamalian et al.,<sup>29</sup> and Huang et al.,<sup>30</sup> in TMD patients. The rate of self-reported bruxism was the highest in patients with myofascial pain (48.4%) followed by the patients with DDwR (38.1%) and DDwoR (13.5%). Manfredini et al.,<sup>31</sup> reported the highest prevalence of bruxism in combined myofascial pain and disc displacement (87.5%), and 68.9% for myofascial pain alone. Bruxism tends to have a stronger relationship with muscle disorders than with disc displacement and joint pathologies.<sup>31</sup>

## Conclusion

Demographic characteristics of TMD patients of a dental school in Ankara, Turkey showed similar gender and age predilection to those reported in the literature with a female predisposition. Gender did not affect the intensity of pain. Presence of self-reported bruxism did not relate with a specific sub-diagnosis such as level of education.

Besides a thorough anamnesis, patient history and clinical examination, more detailed information including parafunctional activity and sociodemographic factors enhance distinguishing the accurate diagnosis.

## Acknowledgment

“None Declared.”

## Conflict of Interest

“None Declared.” ■

## References

1. Diercke K, Zimmermann H, Hellmann D, Kim TS, Fricke J, El Sayed N, et al. Prevalence of TMD symptoms in Turkish migrants and re-settlers from the former Soviet Union in comparison to a German group. *Cranio*. 2016;34:316–322.
2. Suvinen TI, Reade PC, Hanes KR, Kononen M, Kemppainen P. Temporomandibular disorder subtypes according to self-reported physical and psychosocial variables in female patients: a re-evaluation. *J Oral Rehabil*. 2005;32:166–173.

3. Manfredini D, Lobbezoo F. Relationship between bruxism and temporomandibular disorders: a systematic review of literature from 1998 to 2008. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2010;109:e26–e50.
4. Manfredini D, Chiappe G, Bosco M. Research diagnostic criteria for temporomandibular disorders (RDC/TMD) axis I diagnoses in an Italian patient population. *J Oral Rehabil.* 2006;33:551–558.
5. Manfredini D, Guarda-Nardini L, Winocur E, Piccotti F, Ahlberg J, Lobbezoo F. Research diagnostic criteria for temporomandibular disorders: a systematic review of axis I epidemiologic findings. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2011;112:453–462.
6. Manfredini D, Piccotti F, Ferronato G, Guarda-Nardini L. Age peaks of different RDC/TMD diagnoses in a patient population. *J Dent.* 2010;38:392–399.
7. Alonso AA, Heima M, Lang LA, Teich ST. Dental students' perceived level of competence in orofacial pain. *J Dent Educ.* 2014;78:1379–1387.
8. Lindfors E, Tegelberg A, Magnusson T, Ernberg M. Treatment of temporomandibular disorders - knowledge, attitudes and clinical experience among general practicing dentists in Sweden. *Acta Odontol Scand.* 2016;74:460–465.
9. Plesh O, Adams SH, Gansky SA. Racial/Ethnic and gender prevalences in reported common pains in a national sample. *J Orofac Pain.* 2011;25:25–31.
10. Sipilä K, Tolvanen M, Mitrirattanakul S, Sitthisomwong P, Järvelin MR, Taanila A, et al. Orofacial pain and symptoms of temporomandibular disorders in Finnish and Thai populations. *Acta Odontol Scand.* 2015;73:330–335.
11. Hongxing L, Astrom AN, List T, Nilsson IM, Johansson A. Prevalence of temporomandibular disorder pain in Chinese adolescents compared to an age-matched Swedish population. *J Oral Rehabil.* 2016;43:241–248.
12. List T, Dworkin SF. Comparing TMD diagnoses and clinical findings at Swedish and USTMD centers using research diagnostic criteria for temporomandibular disorders. *J Orofac Pain.* 1996;10:240–253.
13. Yap AU, Dworkin SF, Chua EK, List T, Tan KB, Tan HH. Prevalence of temporomandibular disorder subtypes, psychologic distress, and psychosocial dysfunction in Asian patients. *J Orofac Pain.* 2003;17:21–28.
14. Auerbach SM, Laskin DM, Frantsve LM, Orr T. Depression, pain, exposure to stressful life events, and long-term outcomes in temporomandibular disorder patients. *J Oral Maxillofac Surg.* 2001;59:628–633.
15. Alzarea BK. Temporomandibular disorders (TMD) in edentulous patients: a review and proposed classification (Dr. Bader's Classification). *J Clin Diagn Res.* 2015;9:ZE06–ZE09.
16. Blanco-Hungria A, Blanco-Aguilera A, Blanco-Aguilera E, Serrano-del-Rosal R, Biedma-Velazquez L, Rodriguez-Torronteras A, et al. Prevalence of the different Axis I clinical subtypes in a sample of patients with orofacial pain and temporomandibular disorders in the Andalusian Healthcare Service. *Med Oral Patol Oral Cir Bucal.* 2016;21:e169–e177.
17. Marklund S, Wanman A. Risk factors associated with incidence and persistence of signs and symptoms of temporomandibular disorders. *Acta Odontol Scand.* 2010;68:289–299.
18. Chen CK, Nizar AJ. Myofascial pain syndrome in chronic back pain patients. *Korean J Pain.* 2011;24:100–104.
19. Collins SL, Moore RA, McQuay HJ. The visual analogue pain intensity scale: what is moderate pain in millimeters? *Pain.* 1997;72:95–97.
20. Racine M, Tousignant-Laflamme Y, Kloda LA, Dion D, Dupuis G, Choiniere M. A systematic literature review of 10 years of research on sex/gender and experimental pain perception – part 1: are there really differences between women and men? *Pain.* 2012;153:602–618.
21. Schmid-Schwab M, Bristela M, Kundi M, Piehslinger E. Sex-specific differences in patients with temporomandibular disorders. *J Orofac Pain.* 2013;27:42–50.
22. Racine M, Tousignant-Laflamme Y, Kloda LA, Dion D, Dupuis G, Choiniere M. A systematic literature review of 10 years of research on sex/gender and pain perception – part 2: do biopsychosocial factors alter pain sensitivity differently in women and men? *Pain.* 2012;153:619–635.
23. Khare N, Patil SB, Kale SM, Sumeet J, Sonali I, Sumeet B. Normal mouth opening in an adult Indian population. *J Oral Maxillofac Surg.* 2012;11:309–313.
24. Gallagher C, Gallagher V, Whelton H, Cronin M. The normal range of mouth opening in an Irish population. *J Oral Rehabil.* 2004;31:110–116.
25. Stoustrup P, Kristensen KD, Kuseler A, Herlin T, Pedersen TK. Normative values for mandibular mobility in Scandinavian individuals 4–17 years of age. *J Oral Rehabil.* 2016;43:591–597.
26. Placko G, Bellot-Samson V, Brunet S, Guyot L, Richard O, Cheynet F, et al. Normal mouth opening in the adult French population. *Rev Stomatol Chir Maxillofac.* 2005;106:267–271.
27. Sierwald I, John MT, Schierz O, Hirsch C, Sagheri D, Jost-Brinkmann PG, et al. Association of temporomandibular disorder pain with awake and sleep bruxism in adults. *J Orofac Orthop.* 2015;76:305–317.
28. Raphael KG, Santiago V, Lobbezoo F. Is bruxism a disorder or a behavior? Rethinking the international consensus on defining and grading of bruxism. *J Oral Rehabil.* 2016;43:791–798.
29. Pergamalian A, Rudy TE, Zaki HS, Greco CM. The association between wear facets, bruxism, and severity of facial pain in patients with temporomandibular disorders. *J Prosthet Dent.* 2003;90:194–200.
30. Huang GJ, LeResche L, Critchlow CW, Martin MD, Drangsholt MT. Risk factors for diagnostic subgroups of painful temporomandibular disorders (TMD). *J Dent Res.* 2002;81:284–288.
31. Manfredini D, Cantini E, Romagnoli M, Bosco M. Prevalence of bruxism in patients with different research diagnostic criteria for temporomandibular disorders (RDC/TMD) diagnoses. *Cranio.* 2003;21:279–285.

**How to cite:**

Hasanoglu Erbasar GN, Alpaslan C. Clinical Characteristics of Temporomandibular Disorders in Patients Admitted to a Dental School Clinic in Turkey. *J Dent Sch.* 2017;35(1):8–11.