Prevalence of Temporo-mandibular joint disorders and associated morbidity among the patients attending dental clinic

Muhammad Umar Shah[1], Zainab Khalid[2], Rummana Aqeel[3], Muhammad Saad Mateen Munshi[4], Shafquat Hussain Khuwaja[5], Hanna Abdul Majeed[6]

ABSTRACT

Objective: To evaluate the prevalence and association of temporomandibular joint (TMJ) disorders with mal-occlusion types, age and gender in patients attending the Outdoor Dental Clinic.
Study Design: A Cross-sectional Observational study.
Place and Duration: At Lahore Medical and Dental College, Lahore from 3rd March 2019 to 3rd May 2019.
Methodology: A Total 200 of patients from both genders, selected to see prevalence of Temporo-mandibular joint (TMJ) disorders with mal-occlusion types in relation to age and gender. The mal-occlusion were assessed by Angle's Classification, different type of problems or symptoms were recorded and association with age and sex assessed.
Results: Most prevalent mal-occlusion in our studied patients were Angle's Class-II (42.5%), followed by Class-I (27%). High prevalence of Temporomandibular joint problems was found among female (62.5%), as compared to the male (37.5%). Majority of patients (71%) were between 20-40 year of age. Clicking was the most prevalent problem reported in both genders (females 59.0%, males 41.0%). Association of Temporomandibular joint problems with malocclusion, age and gender was found using Chi Square test. Statistically insignificant association of Temporomandibular joint problems with respect to age and gender and malocclusion was found. Head and neck muscle pain had significant association with age. (p 0.005). Highest prevalence was reported in age group >40 year.
Conclusion: TMJ problems had no significant association with mal-occlusion types, age and gender, however head and neck muscle pain showed a significant association with age.
Keywords: TMJ disorders, Mal-occlusion, Occlusal imbalance, Click sensation, Muscle pain, Age correlation, Gender correlation.

How to Cite This:
Shah MU, Khalid Z, Aqeel R, Munshi MSM, Khuwaja SH, Majeed HA. Prevalence of Temporo-mandibular joint disorders and associated morbidity among the patients attending dental clinic. Isra Med J. 2020; 12(3): 149-153.

1. Assistant Professor of Prosthodontics, King Faisal University Al Ahsa, Kingdom of Saudi Arabia
2. Assistant Professor of Oral Surgery, Watim Dental College,
3. Assistant Professor of Oral Pathology, Lahore Medical and Dental College.
4. Associate Professor of Prosthodontics, Faryal Dental College
5. Senior Lecturer of Periodontology, Isra Dental College, Isra University, Hyderabad.
6. Associate Professor of Operative Dentistry, Rashid Latif Dental College Lahore.

Correspondence:
Rummana Aqeel
Assistant Professor of Oral Pathology,
Lahore Medical and Dental College.
Email: drsajidnaeem@hotmail.com

Received for Publication: October 28, 2019
1st Revision of Manuscript: December 25, 2019
Accepted for Publication: September 01, 2020

INTRODUCTION

The temporomandibular joint (TMJ) is a unique joint and has a complex structure that requires harmony of many bones (mandibular condyles and glenoid fossa), various ligaments and muscles for its functioning[1]. Temporomandibular Joint Disorders (TMD) is the term used for problems including pain, discomfort, clicking and limited mouth opening[2]. The combined clinical problems reported in TMD generally involve problems with the masticatory muscles and the problems of TMJ and associated muscles[3].

Balance between various oral functions and the masticatory apparatus is all that is required to keep TMJ complex healthy[4]. Many harmful forces generated by Para functional habits, the stresses induced by psychological, mechanical and occupational factors can affect the joint functions[5]. Due to the persistent pressure exerted on the joint complex, different signs and symptoms of TMD appear[2]. The high prevalence rate and the complex presentation of its signs and symptoms have made it among one of the most difficult disorders to treat[2,6,7].

Etiology of TMD is viewed as multi factorial and still remains a subject of controversy[6]. Among many etiological factors, malocclusion is considered to be one of the most common

factor[8]. TMD as a result of malocclusion causes orofacial pain and discomfort[2]. There are many studies reported in the Dental literature on the association of malocclusion with TMD and it's prevelance[4,6,7,9,10]. Generally 30% to 93% prevalence of malocclusion has been reported[11,12]. Associations between different aspects of malocclusion (open bite, cross bite, molar distalization and excessive over jet and TMJ has also been documented[13]. Some studies have shown that Class II malocclusion patients have high chance of getting joint discomfort. Similarly, Class III patients have difficulty in jaw closing due to anteriorly displaced mandible. However in contrast, few researchers had stated that it is not clear that malocclusion creates interior changes in joint or not[14].

TMD is a very common maxillofacial disorder and its prevalence has been reported in different population around the world[4,6,7,13]. A high prevalence of TMJ sounds among the age group of 15 to 25 years old has been documented[15]. Patient may not complain of any TMJ problem on an arbitrary examination, but may have one or more signs of Temporomandibular disorders, which if overlooked can result in recognizable TMJ disfunctioning[16]. An early recognition of these signs is therefore benefinicial[17].

A good percentage of our population also has dental problems like malocclusion. It has been recommended in literature that there should be screening and proper diagnostic programs designed for treating TMJ disorders, especially for those suffering from major malocclusion and TMJ muscle pain[13]. The objective of our study was to find out the prevalence and association of TMJ disorders with various types of malocclusion, age and gender in patients attending the Outdoor Dental Clinic.

METHODOLOGY

This Cross-sectional observational study was conducted at Outpatient Department of Lahore Medical and Dental College, Lahore from 3rd March 2019 till 3rd May 2019. A total of two hundred patients seeking dental treatment were selected form non-probability purposive sampling technique. All those patients with partial or complete tooth loss and those unwilling to share their information were excluded. Verbal informed consent was taken and study was approved by the institutional ethical committee.

Demographic information like age and sex, with signs and symptoms of TMJ discomfort were assessed followed by examination findings i.e. degree of malocclusion by using Angels classification were done. Examination was carried out into two phases. During first phase presence or absence of TMJ discomfort/pain, head, neck and back pains were examined. The malocclusion types were evaluated by examining the molars and canine relations based on Angle's classification. Abnormal occlusal vertical heights, open bite, cross bite was registered. Patients with TMJ discomfort were studied more thoroughly in the second phase of examination. TMJ discomfort was divided into four groups i.e. those patients with TMJ pain, with clicking, with limited mouth opening and patients with head and neck muscles pain.

Pain characteristics (intensity, onset, duration, site, aggravating and relieving factors) were checked, any previous treatment history and unawareness of having TMJ disorders was also recorded. The limited mouth opening was checked by evaluating the patient's ability to open and close his (her) mouth. The degree of mouth opening was measured by scale. Popping sounds or clicking, on mouth opening were noticed. Muscles of mastication were palpated for evaluating tenderness. Tenderness of head, neck and back muscles on palpation was taken as signs of TMJ dysfunction and was recorded. Data collection was done by experienced doctors and was registered by using examination performas.

Data Analysis: SPSS version 20 was used for statistical analysis and Chi square was used to find out the association between the TMJ problems and age, gender and the types of malocclusion. Significance level was set at $p< 0.05$.

RESULTS

Two hundred patients seeking Dental treatment were evaluated for TMJ problems and discomfort. The age ranged was 14 to 66 years, mean age 30.13 years SD ±11.01. Out of 200 patients 75 (37.5%) were males and 125 (62.5%) were female patients. The mean age of the patients was 30.05 years with the range from 14 to 66 years (SD± 11.07). Among the patients 11.5% (35) were in age group less than 20 years, 71% (130) were in the age group 20-40 years and 17.5% (35) were aged 40 years or above.

Among 200 patients' sample, 27.0 % (n=54) patients had Class I molar and canine relations, 52.5% (n=105) had Class II malocclusion, and 20.5 % (n=51) patients had Class- III malocclusion (Table-I). The prevalence of malocclusion types in patients suffering from TMJ discomfort showed that Class II is the most common type of malocclusion existed in patients reported in Dental clinics, followed by class I and then Class III. TMD problems were reported more in female 62.5 % (n=125) than male patients 37.5% (n=75).

The TMJ pain in the current study was most prevalent in Class II malocclusion (n=34)60.3%, followed by Class III (n=15) 25.9% and only (n=9) 15.5% in Class I. The TMJ pain was more in females (n=35) 60.3% than in males (n= 23) 39.7%. Similarly, the pain was most prevalent in age group 20-40 years. Out of all the malocclusion types Class II malocclusion had the highest number of patients with clicking (n=62)59.0%, similarly it was found more in females (n=62) 59.0% as compared to males (n=43)41.0%. It was the most prevalent problem seen in both genders. The age group 20-40 years (n=73) 69.5% was reported with highest percentage of patients with clicking. Highest percentage of limited mouth opening was reported in Class II malocclusion (n=23) 52.3%. It was more prevalent in females (n=37) 77.3% than in males (n=10) 22.7% and found having highest percentage in age group 20-40 years (n=27, 61.4%) as shown in Table- I.

Table-I: TMJ problems with malocclusion, Gender and age (N=200)

TMD problems	Malocclusion types			Gender		Age		
	Class I (54) 27.0%	ClassII(105) 52.5%	Class III (41) 20.5%	Male (n=75)	Female (n=125)	<20 yrs (n=35)	20-40 yrs (n=130)	>40yrs (n=35)
Pain								
Absent	45 (31.7%)	71(50.0%)	26(18.3%)	52(36.6%)	90(63.4%)	22(14.3%)	97(69.3%)	23(16.4%)
Present	9(15.5%)	34(58.6%)	15(25.9%)	23(39.7%)	35(60.3%)	13(22.4%)	33(56.9%)	12(20.7%)
Clicking								
Absent	31(32.6%)	43(45.3%)	21(22.1%)	32(33.7%)	63(66.3%)	20(19.4)%	57(61.3%)	18(19.4%)
Present	23(21.9%)	62(59.0%)	20(19.0%)	43(41.0%)	62(59.0%)	15(14.3)%	73(69.5)%	17(16.2%)
Limited mouth opening								
Absent	40(25.6%)	82(52.6%)	34(21.8%)	65(41.7%)	91(58.3%)	25(14.9%)	103(66.9%)	28(18.2%)
Present	14(31.8%)	23(52.3%)	7(15.9%)	10(22.7%)	34(77.3%)	10(22.7%)	27(61.4%)	7(15.9%)
Head and neck muscle pain								
Absent	43(29.3%)	76(51.7%)	28(19.0%)	88(59.9%)	59(40.1%)	33(21.4%)	93(64.1%)	21(14.5%)
Present	11(20.8%)	29(54.7%)	13(24.5%)	16(30.2%)	37(69.8%)	2(3.8%)	37(69.8%)	14(26.4%)

Table-II: Factors associated with TMJ problems with gender (N=200)

Socio-demographic characteristics	Gender	Present n (%)	Absent n (%)	p-value
Pain	Male (75)	23 (30.7%)	52 (69.3%)	0.68
	Female (125)	35 (28%)	90 (72%)	
Clicking	Male (75)	43 (57.3%)	32 (42.7%)	0.31
	Female (125)	62 (49.6%)	63 (50.4%)	
Head & Neck muscle pain	Male (75)	16 (21.3%)	59 (78.7%)	0.2
	Female (125)	37 (29.6%)	88 (70.4%)	
Limited mouth opening	Male (75)	10 (13.3%)	65 (86.7%)	0.02
	Female (125)	34 (27.2%)	91 (72.8%)	

Table-III: Factors associated with TMJ problems with age (N=200)

Socio-demographic characteristics	Age group in years	Present n (%)	Absent n (%)	p-value
Pain	<20 years (33)	13 (39.4%)	20 (60.06%)	0.22
	20-40 years (130)	33 (25.4%)	97 (74.6%)	
	>40 years (35)	12 (34.3%)	23 (65.7%)	
Clicking	<20 years (33)	15 (45.5%)	18 (54.5%)	0.47
	20-40 years (130)	73 (56.2%)	57 (43.8%)	
	>40 years (35)	17 (48.6%)	18 (51.4%)	
Head & Neck muscle pain	<20 years (33)	2 (6.1%)	31 (93.9%)	0.005
	20-40 years (130)	37 (28.5%)	93 (71.5%)	
	>40 years (35)	14 (40%)	21 (60%)	
Limited mouth opening	<20 years (33)	10 (30.3%)	23 (69.7%)	0.47
	20-40 years (130)	27 (20.8%)	103 (79.2%)	
	>40 years (35)	7 (20%)	28 (80%)	

Highest percentage of head and neck muscle pain was found in patients with Class II malocclusion (n=29) 54.7%. It was more in females (n= 37, 69.8%) as compared to males (n=16) 30.2 %. Similarly, its high prevalence was reported in age group 20 -40 years (n=37)69.8% Table-I.

Association of TMJ problems with respect to age group and gender using Chi square showed that, only head and neck muscle pain had a significant association with respect to age groups (p=0.005). It was highest in age group (>40 years) followed by (20-40 years) and least reported in less than 20 years as shown in Table-II and Table-III.

Table-IV: Factors associated with TMJ problems with malocclusion (N=200)

Socio-demographic characteristics	Malocclusion	Present n (%)	Absent n (%)	p-value
Pain	Class I (54)	9 (16.7%)	45 (83.3%)	0.06
	Class II (105)	34 (32.4%)	71 (67.6%)	
	ClassIII (51)	15 (36.6%)	26 (63.4%)	
Clicking	Class I (54)	23 (42.6%)	31 (57.4%)	0.12
	Class II (105)	62 (59%)	43 (41%)	
	ClassIII (51)	20 (48.8%)	21 (51.2%)	
Head & Neck muscle pain	Class I (54)	11 (20.4%)	43 (79.6%)	0.43
	Class II (105)	29 (27.6%)	76 (72.4%)	
	ClassIII (51)	13 (31.7%)	28 (68.3%)	
Limited mouth opening	Class I (54)	14 (25.9%)	40 (74.1%)	0.6
	Class II (105)	23 (21.9%)	82 (78.1%)	
	ClassIII (51)	7 (17.1%)	34 (82.9%)	

Insignificant association of all TMJ problems (pain, clicking, head and neck muscle pain and limited mouth opening) with malocclusion types was found. P value ≤0.05 was considered as a level of significance (Table-IV).

DISCUSSION

There are many factors responsible for developing Temporomandibular joint problems and malocclusion is among one of them[2,3]. In the current study the prevalence of TMD

problems with malocclusion types was studied. TMJ problems and it's signs and symptoms are prevalent in almost 50% world's population[4,6]. In the current study we found high prevalence of TMD symptoms in females 62.5% than in males. In accordance with the result of present study many other epidemiological studies had reported high frequency of TMD existence in females[4]. Dental literature has shown its ratio more in female than males (3:1, 8:1, 10:1)[4]. Perez and coworkers[18], had reported the female patients' incidence of TMD up to 87.5%, however in males it was 12.5 %. These differences were well explained due to difference of hormonal and behavioral factors of both genders. Women also prefer clinical examination and seek treatment earlier than men[4,18].

It was found that Class II malocclusion (52.5%) was found to be the most common type. This result is in agreement with the results of the studies showing Class II, the most prevalent type of malocclusion[1]. Furthermore it is equally prevalent in its subtypes (Class II div I, Class II div II).[1] Basafa and Shahabee[14] stated correlation between TMD and Class II malocclusion. They further documented the rate of TMD within the types of malocclusion (Class II > Class 1> Class III). In their study they had reported 43% patient with Class I malocclusion, 12.2 % Class II div I, and 7% with Class II div II malocclusion. This finding is in accordance with the results of the current study in which Class II malocclusion was the most prevalent malocclusion and Class III was the least. In light of these finding it is revealed that in Class III malocclusion, TMJ discomfort is less.

In the present study statistically, insignificant association was found between TMD problems and malocclusion types. This finding is in accordance with the results found by Basafa et al[14] who also found no association between the two parameters. They further stated that among all malocclusion types, highest association that was still significantly insignificant was found with Class II malocclusion. In contrast to the present study Perez et al[18] did a study in Mexican students and found significant association between the two attributes ($p<0.05$). Similarly, Graber and colleague[13] reported association between the two parameters. TMD symptoms like pain, clicking and limited mouth opening showed no association with age and gender. However, head and neck muscle pain had a significant association (p0.005) with age. It was more in age group >40 years followed by 20-40 and lastly < 20 years. Basafa et al[14] also reported 4% patients with TMD and head and neck muscle pain. They reported 22.1% patients suffering from TMJ discomfort and pain and clicking was their main problem. Head and neck pain were also present in those patients. ($p = 0.21$). Perez LS et al[18] also reported TMD muscle pain in 26.1 % patients.

Out of all TMD symptoms clicking was the most common problem reported in both genders. However according to Tuerling et al found muscle tenderness as the most frequent problem among 80.9% of the population[19]. In agreement with the results of current study, Bora[20] reported 39%patients with clicking as their most prevalent problem. However, in contrast to the present study they found significant difference in both genders.

In summary, the high prevalence of TMJ problems were found in females, with clicking the most common problem and Class II the most common malocclusion type. The small sample size was one of the limitations of the study and another variable like ethnicity should be included. There is literature available worldwide but more work should be carried out nationwide for development of strong Pakistani reference material to compare it with other studies worldwide. It is suggested that further studies are needed on a wider scale to find out the exact relation between malocclusion types and TMJ discomfort.

CONCLUSION

- TMJ problems had no significant association with malocclusion types, age and gender, however head and neck muscle pain showed a significant association with age.

AUTHOR'S CONTRIBUTION

Shah MU: Manuscript writing
Khalid Z: Conceived idea
Aqeel R: Data collection
Munshi MSM: Statistical analysis
Khuwaja SH: Literature review
Majeed HA: Manuscript final reading

Disclaimer: None.
Conflict of Interest: None.
Source of Funding: None.

REFERENCES

1. Jha P, Peto R. Global effects of smoking, of quitting, and of Pai SA, Poojari SR, Ramachandra K, Patel RKV, Jyothi M. Joint-An anatomical view. J Adv Clin Res Insights 2019; 6(1):1-5.
2. Fale H, Hnamte L, Dedia S, Pasad S, Kohale S, Sen S. Association between parafunctional habit and signss and symptoms of temporomandibular dysfunction. Dent Res Rev 2018; 5:17-21.
3. Chisnoiu AM, Picos AM, Popa S, Chisnoiu PD, Lascu L, Picos A et al. Factors involved in etiology of temporomandibular disorders-a literature review. Clujul Med 2015; 88(4):473-478.
4. Sánchez-Pérez L, Irigoyen-Camacho ME, Molina-Frechero N, Mendoza- Roaf P, Medina-Solís C, Acosta-Gío E, et al. Malocclusion and TMJ disorders in teenagers from private and public schools in Mexico City. Med Oral Patol Oral Cir Bucal 2013; 18 (2):312-318.
5. Alkhudhairy MW, Ramel FA, Jader GA, Saegh LA, Hadad AA, Alalwan T et al. A self-reported association between temporomandibular joint disorders, headaches, and stress. J Int Soc Prev Community Dent 2018; 8(4):371-380.
6. Bhat S. Etiology of temporomandibular disorders: The J Int Dent 2010; 12:187-194.
7. Karthik R, Hafila MIF, Saravanan C, Vivek N, Priyadarsini P, Ashwath B. Assessing prevalence of Temporomandibular disorders among university students: A questionnaire study. J Int Soc Prev Community Dent 2017; 7(1):249-252.

8. Caldas W, de Castro AC, Conti F, Janson G, Rodrigues CPC. Occlusal changes secondary to temporomandibular joint conditions: a critical review and implications of clinical practice. J Appl Oral Sci 2016; 24(4):411-419.
9. Thilander B, Rubio G, Pena L, de Mayorga C. Prevalence of temporomandibular dysfunction and its association with malocclusion in children and adolescents: an epidemiologic study related to specified stages of dental development. Angle Orthod. 2002; 72:146-154.
10. John MT, Hirsch C, Drang sholt MT, Mancl LA, Setz JM. Over-bite and overjet are not related to self-report of temporomandibular disorder symptoms. J Dent Res. 2002; 81:164-169.
11. Michelotti A, Iodice G. The role of orthodontics in temporomandibular disorders. J Oral Rehabil. 2010; 37:411-429.
12. Gelgör IE, Karaman AI, Ercan E. Prevalence of malocclusion among adolescents in central Anatolia. Eur J Dent. 2007; 1:125-131.
13. Dzingute A, Pileicikiene G, Baltusaityte A, Skirbutis G. Evaluation of the relationship between the occlusal parameters and symptoms of temporomandibular joint disorder. Acta Med Litu 2017;24(3):167-175.
14. Basafa M, Shahabee S. Prevalence of TMJ disorders among students and its relation to malocclusion. The Iranian J ORL 2006; 18: 53-59.
15. Ali KF, Fatima A, Ilyas BF. Impact of anxiety and depression on the Temporomandibular joint disorders among sample of Dental undergraduates of Karachi. J of Pak Dent Assoc 2016; 25(4):55-61.
16. Hashemipour MA, Moslemi F, Mirzadeh A, Mirzadeh A. Parafunctional habits and their relationship with temporomandibular joint disorders in Iranian school students. Meandros Med Dent J 2018;19:247-253.doi:10.4274/meandross.41636.
17. Heir GM. The efficacy of pharmacologic treatment of temporomandibular joint disorders. Oral Maxillo-fac Surg Clin North Am 2018; 30(3):279-285.
18. Pérez LS, Camacho MEI, Frechero NM, Roaf PM, Solís CM, Gío EA et al. Malocclusion and TMJ disorders in teenagers from private and public schools in Mexico City. Med Oral Patol Oral Cir Bucal 2013; 18 (2):312-318.
19. Tuerlings V, Limme M. The prevalence of temporomandibular joint dysfunction in mixed dentition. The Eur J Orth 2004; 26(3):311-320.
20. Bagis B, Ayaz EA, Turgut S, Durkan R, Ozcan M. Gender difference in prevalence of signs and symptoms of temporomandibular joint disorders: A retrospective study on 243 consecutive patients. Int J Med Sci 2012; 9(7):539-544