

# Sign and Symptom of Temporomandibular Joint Disorders and Associated Parafunction Habits in Young Adults

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## ABSTRACT

**Objective:** The objective of this study was to determine the signs and symptoms of temporomandibular joint diseases and parafunctional habits contributing to TMD.

**Method:** Using a structured proforma and questionnaire data was collected from 162 subjects to determine signs and symptoms of temporomandibular joint diseases and associated parafunctional habits contributing to TMD.

**Results:** The results showed that most frequent reporting sign was painful TMJ (61.4% females) and (56.96% males) while least frequent sign was deviation of mandibular movement representing (24.09% and 26.58%) neck stiffness (26.0% and 22.7%) and mandibular deviation (24.09% and 26.58%). Clicking and clenching was reported to be 49.39% and 42.16% in females and 39.24% and 40.50% in males respectively. The percentage distribution of headache was noted to be 42.16% in females and 40.50% in males. While 60.24% females and 44.30% males reported themselves to be stressed or tense. Painful muscles were however reported by 33.73% females and 27.84% males. Lip and cheek biting /chewing gums was the most common parafunctional habit (41.97%) with females significantly more than males, followed by nail biting and bruxism (15.43% and 14.19%). Thumb sucking was found to be present in 4.9% of individuals. However 23.45% reported themselves to be free of any habit.

**Conclusion:** The study has shown that TMD remains largely undiagnosed in our general population and it can be related very well with anxiety, headache and bad lifestyle habits.

**Keywords:** Temporomandibular joint disorder (TMD), Sign and Symptoms, Parafunction

## INTRODUCTION

Temporomandibular disorders (TMDs) are associated with functional disturbances of the masticatory system.<sup>1</sup> It is generally accepted that TMDs have multifactorial causes such as emotional stress, occlusal interferences, malpositioning or loss of teeth, postural changes, dysfunctions of the masticatory musculature and adjacent structures, extrinsic and intrinsic changes on TMJ structure, and/or a combination of such factor<sup>1</sup>. Certain non-patient prevalence studies have reported that approximately 50%–75% of participants exhibit one or more signs of TMD and 33% have at least one symptom.<sup>2</sup>

Signs and symptoms of TMD in children and adolescents have been studied since the beginning of the 1970s<sup>3</sup>. The most prevalent clinical signs of TMD are TMJ sounds (upon palpation), limitation of mandibular movements, TMJ and muscle tenderness<sup>4</sup>. With regard to subjective symptoms, headache, TMJ sounds, bruxism, difficulty in opening the mouth, jaw pain, and facial pain are found.<sup>1</sup>

The role of gender in TMD is also extensively discussed in literature, suggesting that TMD is considered to be 1.5-2 times more prevalent in women than in men, and that 80% of the patients treated for this disorder are women.<sup>5</sup> However, the most prominent gender differences have been found in women aged 20-40 years, and the lowest among children, adolescents and the elderly<sup>6</sup>. Furthermore, the predominance of women is even higher in surveys of people seeking treatment for TMD pain, with a ratio of 4:1 or 5:1<sup>7</sup>.

Disorders of the Temporomandibular joint (TMJ) have an adverse effect on jaw function so that patients may present with limited mouth opening or difficulty chewing because of pain and locking in the TMJ<sup>2</sup>. In the general dental practice setting, patients may complain of cramp like pain in their masticatory muscles or painful clicking in their temporomandibular joints (TMJ) which may have been exacerbated by lengthy dental procedures.<sup>8</sup>

Temporomandibular disorder (TMD) is a common orofacial disorder<sup>9</sup> which can undermine a patient's quality of life<sup>10</sup>. TMD is generally classified into three subtypes: muscular disorders; disc displacement; and degenerative diseases.<sup>3</sup> Up to 25% of the population may experience symptoms of TMD. However, only a

small percentage of the afflicted individuals seek treatment for pain and dysfunction<sup>8</sup>. Complicated etiology, ignored early symptoms and the lack of specific diagnostic criteria make early diagnosis of TMD a challenge.<sup>8</sup> TMD is usually associated with tenderness in the jaw muscles and joints and deviation or deflection of the mandible, locking of the joint, and joint sounds such as clicking or popping noise during opening or closing the mouth.<sup>11</sup> Pain is usually experienced in the masseter muscle, pre auricular area, and/or anterior temporalis muscle regions.<sup>10</sup> The pain may be dull, poorly localized, and unilateral rather than bilateral<sup>11</sup>. There may also be episodes of sharp pain, and when the pain worsens, the primary pain quality may become a throbbing sensation. Patients with TMD tend to report that their pain is intensified by events such as stress, clenching and eating, while it is relieved by relaxing, applying heat to the painful area, and taking over-the-counter analgesics.<sup>10</sup> Early diagnosis and treatment of TMD is very important because it is a progressive disease which gets worse with the passage of time. If treated in early stage, the prognosis of this disease is good, at later stages, it becomes irreversible because of damage to TMJ.<sup>12</sup> Presence of inflammatory mediators, tissue necrosis factor, and presence of pain mediators multiply with the passage of time.<sup>12</sup>

The reported prevalence of TMD in infants, children, and adolescents varies widely in the literature, due to differences in the populations studied, diagnostic criteria, examination methods, and inter- and/or intra-rated variations of examining practitioners.<sup>6</sup> Furthermore, studies have demonstrated that the prevalence of TMD symptoms and signs is rare in early childhood<sup>7</sup>. However, it becomes more prevalent in adolescence<sup>13</sup> and adulthood, with a prevalence ranging from 4.9%<sup>14</sup> to 60%<sup>15</sup> with the incidence of signs and symptoms generally increasing with age<sup>16</sup>.

## MATERIAL AND METHODS

The sample consisted of 162 subjects, 83 females and 79 males, reporting to Khyber College Of Dentistry Peshawar with at least one clinical feature. Approval from hospital ethical committee was taken. Subjects referred from OPD presenting with single clinical feature were invited to participate in study. Inclusion criteria were: all permanent dentition stage (absence of primary teeth), no history

of orthodontic treatment, no craniofacial anomalies. Patients were informed regarding the purpose of the study and consent forms were obtained.

#### Clinical examination:

The examination was carried out by two examiners from the department of Prosthodontics Khyber College Of Dentistry Peshawar. The examinations on the patients were carried out in the ward under proper lighting and subjects were seated upright during the examination.

#### Examination of TMD

**TMJ sound:** Digital palpation of the TMJ was done using the middle and index fingers and by audibly listening during opening and closure of the mouth and by palpation no stethoscope was used. Listening to joint sounds was done with the examiner's ear within 5 cm of the TMJ. The examiner placed the middle and index finger over the TMJ area on each side of the head and the student was asked to open and close several times. Any irregularities on closing or opening were recorded.

**Muscular disorder:** Digital palpation of the TMJ and associated muscles was performed to detect tenderness using the index, middle and the third finger. The Masseter, Temporalis and the Sternocleidomastoid muscles were palpated bilaterally for tenderness. Intraoral muscles were not examined. The TMJ tenderness was also assessed during mandibular movement. Pain was registered as 'absent' or 'present'.

**Range of the mandibular motion:** The amplitude of maximum vertical opening (MVO) was recorded using a Boley gauge. The gauge was placed on the mandibular incisor edge adjacent to the midline. The patient was asked to open as wide as possible and the inter-incisal distance measurement was recorded. This process was repeated twice, and the average was obtained. The overbite value was added to the measurement to obtain the MVO. In cases of openbite the inter-incisal distance was subtracted to obtain the exact MVO. The lower limit for normal mouth opening was considered 40 mm. The opening deviation was defined as the displacement of mandible at least 2 mm to the right or left of an imaginary vertical line when the mandible had reached half of its vertical opening. The patient was asked to open the mouth slowly and this was repeated several times for confirmation.

#### Questionnaire

The subjects were requested to answer a questionnaire that included history of frequent headache, neck stiffness, Temporomandibular pain, clenching, and whether patient consider himself/herself as a tense individual. Other questions on parafunctional habits such as nail/check biting, bruxism, finger and thumb sucking were also included in the questionnaire.

## RESULTS

The prevalence of signs and symptoms and gender differences are shown in table. In the whole sample of population the least frequent sign was deviation of mandibular movement representing 24.09% and 26.58% and neck stiffness with %age distribution of 26.0% and 22.7% among female and male population respectively.

The most frequent percentage distribution among individuals seemed to be painful Temporomandibular joint (61.04%) and (56.96%). Clicking and Clenching were found to be 49.39% and 42.16% for females and 39.24% and 40.50% for males respectively. The most frequent symptom was reported to be painful tmjoint while least noted sign was deviation in mandibular movement. Generally the prevalence of symptoms is higher In females than in males.

Headache was reported to be present in 35 female and 32 male subjects making a percentage of 42.16% and 40.50% for females and males respectively. However, 60.72% females and 44.30% males reported themselves to be stressed or tense individuals.

From the questionnaire percentage distribution of parafunctional habits are shown in the table 2. Lip and cheek biting was the most frequent habit (41.97%) and the females were significantly more than males. Nail biting was the second most

frequent habit( 15.43%)with no gender difference .However percentage distribution of thumb sucking and bruxism was reported to be 14.19% and 4.9%respectively,with 23.45% of subjects reporting them to be free of any habit as shown in the table.

Table 1: sign and symptoms of temporomandibular joint disorder:

Sign and symptoms	Positive answers by females	%age Females(83)	Positive answers by males	%age Males (79)
TMJ sound	41	49.39%	31	39.24%
Muscle pain	28	33.73%	22	27.84%
Limited mouth opening	36	43.37%	30	37.97%
Mandibular deviation	20	24.09%	21	26.58%
Headache	35	42.16%	32	40.50%
Neck stiffness	22	26.00%	18	22.70%
TMJ pain	51	61.40%	45	56.96%
Clenching	35	42.16%	32	40.50%
Stress /tension	50	60.24%	35	44.30%

Table 2: parafunctional habits:

Parafunctional habits	Positive answers	%age
Lip biting/ cheek biting/ Chewing gum	68	41.97%
Nail biting	25	15.43%
Bruxism	23	14.19%
Thumb sucking	8	4.9%
No habit	38	23.45%

## DISCUSSION

The number of studies regarding prevalence of temporomandibular joint diseases in young children have been published. The aim of this study was to evaluate the prevalence of sign and symptom through questionnaire and compare the findings with other national and international studies. The present study has shown that the prevalence of clinical sign and symptom of temporomandibular joint disease is higher in females as compared to males.

The most frequent complaint was of painful temporomandibular joint (61.04% and 56.96%) while the least frequent being deviation in mandibular movement (24.09% and 26.58%) and neck stiffness (26.0%and 22.7%) as supported by study of oyetola.<sup>17</sup> We have found significant association between stress, headache and temporomandibular joint disorder as shown in other studies.<sup>18</sup> Stress and anxiety has also been associated significantly with TMD in our study and was found in agreement with other studies.<sup>19</sup> There has been found a significant association between stress and presence of TMD ,as 60.72% subjects reported themselves to be stressed which is a major predisposing factor ,this finding has been narrated in multiple other studies.<sup>18,20</sup>

The prevalence of TMD'S was found to be higher among females than male. A strong female preponderance observed by Milam and Manfredini .et.al in which reported female to male ratio is about 2.6:1 <sup>21</sup> and by Bonjardim et al which showed percentage of women with TMD is higher than that of men. <sup>22</sup>In our study females were found to have greater risk of TMD than males. Manfredihi et.al. made similar observations in a study of 433 patients.<sup>21</sup>

These higher prevalence rates for women indicate that possible biological, psychological and social factors are associated with female gender that increase the risk of TMD. <sup>23</sup>One hypothesized reason for women suffering a higher prevalence of TMD is psychological variances of female , including hormonal variations, different characteristics of connective tissues and brain function and structure.<sup>24,25</sup> One study confirmed that there are many estrogen and progesterone receptors within the intraarticular cartilage in women with TMD.<sup>24</sup>

TMJ sounds and clenching are other sign and symptoms of TMD. In our study click was found to be present 49.39% females and 39.24% males respectively. Significant difference was noted in

between the genders regarding clicking sounds. Troeltzsch et al reported a significant difference in females as compared to males in a series of 1031 patients.<sup>26</sup>

Painful jaw movements frequently lead to reduction in mouth opening which create problems while chewing and social difficulty for patients. Clinically limited mouth opening poses problems for dental treatments. In general, the mouth opening is greater in males than females. This difference is a result of significant difference in mandibular length between males and females.<sup>27,28</sup> Our results also indicated that patients with limited mouth opening were mostly females (43.37%) as compared to males (37.97%) as reflected in study of Bagis.<sup>29</sup>

Reportedly, Parafunctional habits were not common in this study except for lip and cheek biting (41.97%) other parafunctional habits of nail biting and bruxism were reported to be 15.43% and 14.19%. parafunctional habits of thumb sucking was reported to be low of occurrence reporting 4.9% while 23.45% of population with sign and symptom of TMD reported themselves to be free of any habit. Higher prevalence of lip biting and chewing gum has also been demonstrated in a study Schiffman et al which reported most prevalent habit of chewing gum (87%) and positive correlation between parafunctional habits and mandibular disorder.<sup>30</sup> Gavish et al evaluated 248 girls and reported that most prevalent habit was chewing gums in the development of TMD.<sup>31</sup> Lobbezoo et al and Restrepo et al reported most prevalent parafunctional habit to be tooth grinding and nail biting.<sup>32,33</sup> The viscous pain theory assumes that sleep bruxism causes pain that results in muscle spasms thus leading to further pain. thus parafunctional habit of bruxism leading to TMD is consistent with most of the studies.<sup>34</sup> Prevalence of parafunctional habits has reported to be different in different communities which might be attributed to differences in the study population.<sup>29</sup> in addition individual psychological status, habits and sleep status can also effect these factors.<sup>29</sup>

## CONCLUSION

This study has shown that TMD remains largely undiagnosed in our general population and it correlate very well with anxiety, stress, headache and bad oral and lifestyle habits. We need to raise awareness among the population and health professionals alike to better screen for and treat TMDs.

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