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RESEARCH ARTICLE

Frequency of myofascial temporomandibular disorder in fibromyalgia patients

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ABSTRACT

Background: Fibromyalgia is a rheumatic disorder with key symptoms being widespread chronic pain, cognitive difficulties, sleep disorders, and fatigue or tiredness. There is a relation between temporomandibular disorders (TMD) and fibromyalgia due to their shared epidemiological, pathophysiological, and clinical symptoms.

Objective: To determine the frequency of myofascial temporomandibular disorder in fibromyalgia patients.

Methods: It was a descriptive cross-sectional study. The ethical approval was obtained having reference number LCPT/DPT/20/540. A total of 264 participants with age ranges from 30 to 60 years, both males and females diagnosed with fibromyalgia according to the American College of Rheumatology Criteria were included in this study. The Fonseca Anamnestic Index (FAI) questionnaire was used in order to diagnose temporomandibular disorders in participants who were previously diagnosed with fibromyalgia.

Results: 22.7% of participants (n=60) were found to have no TMD according to the FAI scoring. 30.6% (n =81) showed symptoms of mild TMD, 26.1% (n=69) showed moderate TMD and 20.5% (n=54) showed symptoms of severe TMD. The most common complaint was tiredness and muscular pain during chewing 59.1% (n=156), followed by headaches 44.3% (n=117).

Conclusion: A higher prevalence of myofascial temporomandibular disorder (TMD) was reported among the participants, with almost one-third experiencing mild symptoms. Notably, chewing-related pain and frequent headaches were prevalent issues.

Keywords: Central sensitization, Fibromyalgia, Temporomandibular joint disorders.

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Introduction:

Fibromyalgia is a rheumatic disorder with key symptoms being chronic pain that is widespread, cognitive difficulties (most markedly fibro fog), sleep disorders, and fatigue or tiredness.(1,2) Patients of fibromyalgia also have a higher incidence of co-morbidities, including psychiatric conditions such as depression, anxiety disorder, and bipolar disorder as well as other rheumatologic conditions like rheumatoid arthritis and systemic lupus erythematosus.(3-5) According to the American College of Rheumatology criteria, patients with fibromyalgia were diagnosed based on the presence of 11 out of 18 tender points.(6-8) This has since been modified to include a Widespread Pain Index (WPI) and a Symptom Severity (SS) scale.(9,10)

The pain of fibromyalgia syndrome may involve many muscle groups.(11) It is usually persistent pain with an intensity that varies considerably.(12,13) Patients of fibromyalgia usually exhibit features such as increased sensitivity to both normally painful and non-painful stimuli, conditions known as Hyperalgesia and Allodynia.(14-16) Patients may also complain of Paresthesia. Cold weather, stress, and poor sleep may aggravate the pain.(17,18) While the cause and pathogenesis are mostly unknown, it is now believed that fibromyalgia is caused by central sensitization.(19-21) The prevalence of fibromyalgia worldwide is found to be 2.7%.(22) In a study conducted in Pakistan, a 1:13 ratio of males to females affected with Fibromyalgia was reported.(23)

Temporomandibular Disorders (TMD) are a group of Craniofacial Pain Disorders involving the Temporomandibular joint and the muscles of mastication.(24) They may include pain in the muscles, reduced Range of Motion (ROM), joint clicking or

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crepitus, and deviation of the mandible while opening the mouth.(25) Headaches and migraines are also a common feature of TMD, with up to 85.5% of patients experiencing headaches in some capacity.(26) In 70% of patients, these disorders are caused by mal-positioning of the disc.(27) Muscle pain, also known as Myalgia, is the most common TMD diagnosis, occurring in 80% of patients with TMD. Joint pain, or Arthralgia, can occur alongside it, but is rarely found alone.(28)

There is a relation between temporomandibular disorders and fibromyalgia due to their shared epidemiological, pathophysiological, and clinical symptoms, with one study showing that the prevalence of chronic pain development is about 10% in all patients of Temporomandibular Disorders.(29) Another study showed that 53% of fibromyalgia patients report facial pain, with 71% of them fulfilling the criteria for TMD, a significantly higher number than in the general population.(30) In these patients, myofascial TMD seems to be the most prevalent.(31)

While the link between fibromyalgia and temporomandibular disorders (TMD) has been acknowledged in the literature, our study distinguishes itself by being one of the first conducted in Pakistan to specifically investigate the prevalence of myofascial temporomandibular disorder in fibromyalgia patients. This specific focus on myofascial TMD within the context of Fibromyalgia is a novel aspect. To the best of our knowledge, has not been explored in previous research conducted in our region. By bridging this gap, our study aims to provide fresh insights that can inform a more targeted and nuanced approach to the management of Fibromyalgia, thereby contributing to the advancement of therapeutic strategies and ultimately improving the quality of life for affected individuals.

Methods:

It was a descriptive cross-sectional study. A total of 264 participants were recruited from National Hospital, Fatima Memorial Hospital and Ghurki Trust Teaching Hospital, Lahore. The sampling technique utilized was non-probability convenience sampling. The duration of study was from June to December, 2020. The study was approved from the ethical board of Lahore College of Physical Therapy (Ethical Approval No. LCPT/DPT/20/540). Through the World Health Organization Sample Size Calculator, sample size is determined. The estimated sample size was n=264 with 95% confidence interval, anticipated population proportion p=0.0178 and absolute precision d=0.03.(32)

Patients, included in this study with age ranges from 30 to 60 years, both males and females, were diagnosed with Fibromyalgia, according to the American College of Rheumatology Criteria. Patients with history of extensive dental surgery, more than 1 missing teeth, any other chronic pain condition, uncontrolled systemic disease and ongoing ear infection or history of ear infection were excluded from the study. Written informed consent from the participants was taken before data collection.

The participants according to the predetermined inclusion and exclusion criteria were requested to fill the Fonseca Anamnestic Index Questionnaire with assurance to maintain their anonymity and complete protection of their provided data. A consent form was provided alongside the questionnaire, to ascertain that informed consent would be given. In this study, the Fonseca Anamnestic Index (FAI) is employed as a 10-item questionnaire to assess the presence and severity of Temporo-Mandibular Disorders (TMD). The FAI has established convergent validity AVE (Average Variance Extracted) = 0.513, CR (Composite Reliability) =0.878 and internal consistency a (Cronbach's Alpha) = 0.74. (33,34) With high sensitivity (97.21%), positive predictive value (84.96%), and negative predictive value (68.42%), the FAI utilizes a scoring system ranging from 0 to 100.(35,36) Respondents' answers, measured on a 3-point scale (0 for 'no,' 5 for 'sometimes,' and 10 for 'yes'), contribute to a final score.(37) The final score is obtained by the sum of all answers which categorizes respondents into four groups: absence of signs and symptoms of Temporomandibular Disorders (TMD) (0–15 points), mild TMD (20–45 points), moderate TMD (50–65 points), and severe TMD (70–100 points).(38,39) The FAI is specifically employed in this study to measure and classify the severity of Temporo-Mandibular Disorders among the participants. Data was entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics in the form of histogram and frequency tables were used to present the continuous and nominal study variables, respectively.

Results:

Out of 264 participants, the minimum age of participants was 30 years; maximum age was 60 years with a Mean (SD) of 45.67±7.09. Whereas, 88.6% (n=234) were females and 11.4% (n=30) were males.

The table 1 presents responses from participants regarding various symptoms related to Temporomandibular Disorders (TMD) according to Fonseca Anamnestic Index (FAI) Questionnaire. Notably, 59.1% (n=156) experienced muscle pain

Table 1: Fonseca Anamnestic Index (FAI) Questionnaire

Questions	No	Sometimes	Yes
Tiredness or muscular pain while chewing	45 (17%)	63 (23.9%)	156 (59.1%)
Frequent headaches	75 (28.4%)	72 (27.3%)	117 (44.3%)
Pain on nape or stiff neck	93 (35.2%)	45 (17%)	126 (47.7%)
Clicking while chewing or mouth opening	162 (61.4%)	36 (13.6%)	66 (25%)
Clenching or grinding of teeth	105 (39.8%)	72 (27.3%)	87 (33%)

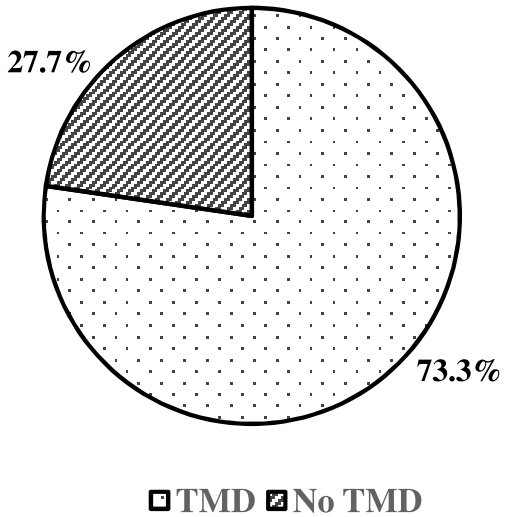

Figure 1: Pie- Classification of TMD in the participants based on total scores of FIA

or tiredness during chewing, while 44.3% (n=117) reported frequent headaches. Regarding neck issues, 47.7% (n=126) reported pain or stiffness, and 25.0% (n=66) experienced clicking sounds in their Temporomandibular joint. Additionally, 33% (n=87) admitted to clenching or grinding their teeth.

On the basis of the total scores of FAI questionnaire, the participants were divided into four groups 22.7% (n = 60) of them had a score of less than 15 and fell into the 'no TMD' category, while 30.6% (n = 81) fell into 'mild TMD' category with a score between 20 and 45. Whereas, 26.1% (n=69) participants were included in the 'moderate TMD' with a score from 50-65 and the least number of participants, 20.5% (n=54) fell into the severe TMD category, with a score of more than 70 in figure 1.

Hence, out of 264 participants, a total of 77.3% (n=204) participants were found to have Temporomandibular Disorder of different categories, whether it fell into the mild, moderate or severe category, while 22.7% (n=60%) participants had no Temporomandibular Disorder as shown in figure 2.

Among the 30 male participants, 80% of them (n=24) were found to have features of Temporomandibular Disorder, compared to 73.5% (n=172) of the female participants. Thus, on the basis of gender, female participants have more TMD as compared to men as shown in table 2.

Discussion:

Fibromyalgia is a chronic pain condition that also causes tenderness and stiffness of the muscles and joints. Other associated symptoms are sleep disturbance, fatigue, anxiety and depression.(40) The purpose of this study was to determine the frequency of symptoms of Temporomandibular Disorders in the patients suffering from Fibromyalgia, using the Fonseca Anamnestic Index.

A study reports the gender disparity in this condition to be around 9:1 with it being significantly more prevalent in women.(41) A similar disparity was noticed in this study, with a 7.8:1 gender ratio of women to men who participated.

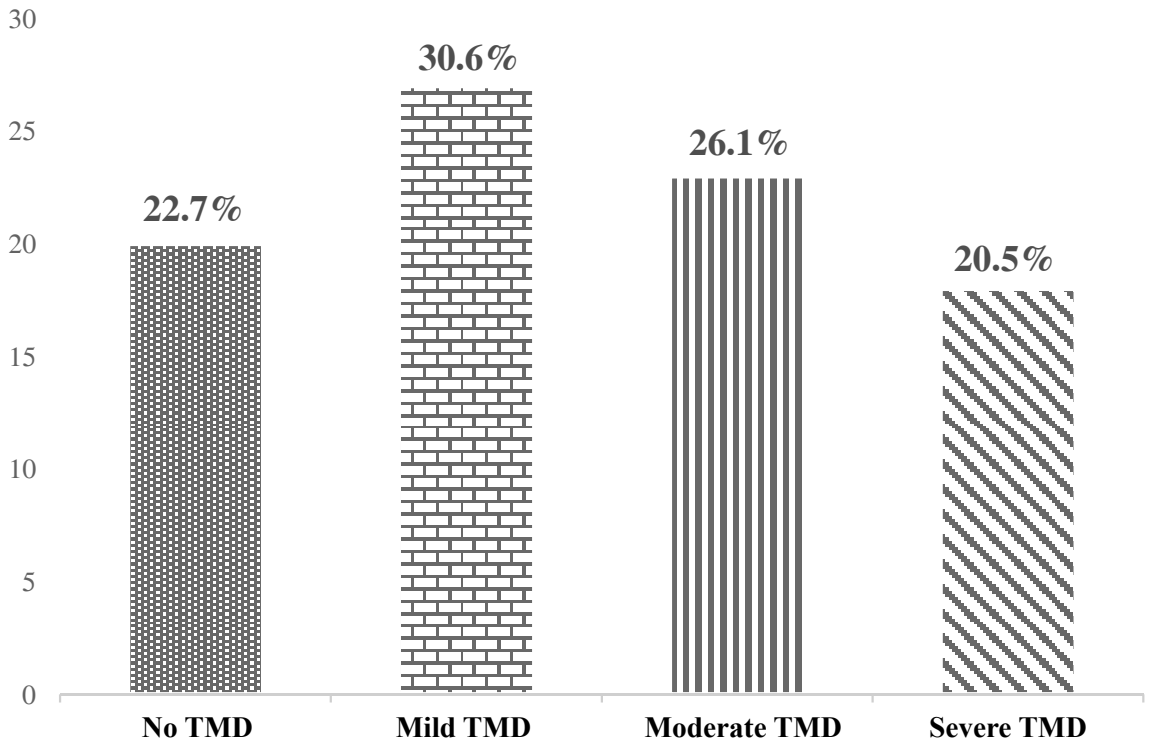

Figure 2: Bar-Chart showing percentage of Temporomandibular Disorder in participants

Table 2: Frequency of participants having TMD based on gender

Gender	Classification	Frequency	Percentage (%)
Male	No TMD	6	20.0%
	TMD	24	80.0%
Female	No TMD	62	26.5%
	TMD	172	73.5%

A systematic review published in 2020 by Creed F, reported that the peak of this disease most commonly lies between 45 and 60 years of age.(42) Most of the participants of this study fell into this age range as well, with a mean of 45.67. Baumler et al., in a study conducted in 2023 reported that three-quarters of Fibromyalgia patients suffered from chronic headaches. (43) This study reported similar findings, suggesting that headache assessment could be an important addition to the evaluation of Fibromyalgia patients.

In a retrospective study about the clinical manifestations and occurrence rates of coexisting factors in individuals experiencing myofascial pain or myalgia of masticatory muscles signs conducted by Chamani G et al. in 2019, it was reported that a quarter of the patients suffering from Fibromyalgia report Bruxism, or clenching of teeth.(44) This study reported a slightly higher prevalence of Bruxism, with more than half of the participants self-reporting clenching and grinding of their teeth.

A narrative review conducted by Scarola et al. in 2021 reported that most of the patients of Fibromyalgia satisfy the criteria for Myofascial Temporomandibular Disorders.(45) This study also reported the same

findings, with most of the patients falling in the criteria of having Temporomandibular Disorders of varying severities. These findings make it even more important for doctors and therapists to clinically screen the patients of Fibromyalgia for symptoms of Temporomandibular Disorders.

A study included 300 participants, of whom 150 were diagnosed with Fibromyalgia and 150 were healthy volunteers. The mean age of the participants was 43.30±10.1 years, and the mean BMI was 26.92±4.10. According to the results of our study; Bruxism, functional limitation, Masseter Hypertrophy, Temporomandibular joint pain and chronic pain are higher in women with Fibromyalgia than in healthy women. This study had similar results as patients with Fibromyalgia had symptoms of Temporomandibular Disorder.(46)

The limitations of this study were that non-probability convenience sampling was used. There was no face-to-face interaction with patients due to COVID-19 precautionary measures so telephonic data was collected.

Conclusion:

A higher prevalence of myofascial Temporomandibular Disorder (TMD) was reported among the participants, with almost one-third experiencing mild symptoms. Notably, chewing-related pain and frequent headaches were prevalent issues. These findings emphasize the significant impact of TMD on daily activities and suggest a need for targeted interventions to enhance patients' quality of life. The correlation between TMD and headaches warrants further investigation for comprehensive patient care.

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Authors Contribution:

Saleem S: Conception, design literature search, collection and assembly of data

Tariq H: Drafting and writing article, statistical analysis, final approval and guarantor of article

Faisal S: Drafting and critical revision of the article

Asim HM: Analysis, interpretation, and article writing

Safdar N: Final approval of the article