

# Correlation between Fibromyalgia and Temporomandibular Dysfunctions—A Systematic Review

Hellen Tomaz Araújo, Aline Kércia Adeodato Leitão, Victor Pinheiro Feitosa, Paulo Roberto Barroso Picanço, Eveline Guedes Fernandes, Diego Martins de Paula

Paulo Picanço School of Dentistry, Fortaleza, Brazil

## Abstract

**Aim:** The aim herein was to evaluate, by a literature review, articles that correlate fibromyalgia and temporomandibular dysfunctions. **Methods:** Literature was searched in PubMed and Medline databases, using the following keywords "fibromyalgia", "facial pain" and "temporomandibular joint". **Exclusion criteria** were review articles and those not related to the topic. Eight papers were selected. **Results:** This paper reported that these two diseases do not only present coexistence relations but also fibromyalgia may predispose to the appearance of temporomandibular disorders. The diffuse pain characteristic of fibromyalgia compromises the nociceptive pathways, causing greater sensitization to the pain in the muscles and damaging the nervous system. Indeed, there is the commitment of the stomatognathic system, which leads patients to develop the symptoms of temporomandibular disorders. **Conclusion:** It is concluded that the greater part of patients diagnosed with Fibromyalgia developed over the years temporomandibular disorders, which indicates that diffuse pain may predispose the pain in the facial muscles.

**Key Words:** Fibromyalgia, Facial pain, Craniomandibular disorders, Temporomandibular joint dysfunction

## Introduction

The Fibromyalgia-FM is a musculoskeletal disease characterized by chronic widespread pain and increased sensitivity due to the commitment of nociceptive channels, which causes the patient with this syndrome to feel constant pain as responses to stimuli that normally do not cause pain [1]. Temporomandibular Joint Dysfunction (TMD) consists of a set of conditions that affect the masticatory muscles and temporomandibular joints and the pain as your main feature [2]. Although the FM and the TMD are considered different diseases to each other, recent studies point to a similarity between the two, due to chronic pain, common in both situations [3,5].

Studies indicate that muscle soreness from the DTM, although it is considered a regional condition, can, in certain individuals, coexist with systemic pain syndromes, such as FM [4]. On the other hand, patients diagnosed with FM feature TMD [1-6]. Both FM and TMD have been associated with a high number of concurrent disorders such as sleep disturbance, anxiety, stress and digestive problems [1].

Temporomandibular dysfunction has a multifactorial origin, that way you can't say that Fibromyalgia triggers the appearance of TMD [5]. In Fibromyalgia, the DTM has an insidious onset and the etiology is not fully known [2].

As such subject is unusual to be studied in schools of dentistry; it would be interesting to do a roundup on the interrelation between current DTM and FM, providing clinician's greater knowledge about the diagnosis and treatment. Thus, the aim of this study was to review the literature evaluating the relationship between Fibromyalgia with signs and symptoms of temporomandibular joint dysfunction.

## Methodology

### Data source

The survey was conducted in PubMed databases and portal of the virtual health library VHL, seeking human studies published in English between the period of 05/03/2012 and 05/03/2018 with the descriptors "Fibromyalgia", "Temporomandibular joint disorders", "craniomandibular disorders", "facial pain". Being also included research on the list of references for articles selected. Pubmed research was performed as follows the *Table 1*, and Medline as *Table 2*.

**Table 1.** Descriptors and numbers of articles found in Pubmed.

Descriptors	Number of articles found
"Fibromyalgia" and "Temporomandibular joint disorders"	28
"Fibromyalgia" and "craniomandibular disorders"	17
"Fibromyalgia" and "facial pain"	12
"Fibromyalgia" and "facial pain" and "craniomandibular disorders" and "temporomandibular joint disorders"	14
"Fibromyalgia" and "facial pain" and "craniomandibular disorders"	5
"Fibromyalgia" and "craniomandibular" and "temporomandibular joint disorders"	14
"Fibromyalgia" and "facial pain" and "Temporomandibular joint disorders"	5

### Eligibility criteria

The inclusion criteria were:

- Articles published in the English language
- Articles that made a direct relationship between Fibromyalgia and Temporomandibular dysfunctions

The exclusion criteria were:

Corresponding author: Diego Martins de Paula, Paulo Picanço School of Dentistry, Fortaleza, Brazil, Tel: +55 (85) 99900-5983; E-mail: diego.martins@facpp.edu.br

- Articles that only cited Fibromyalgia or Temporomandibular dysfunctions, without correlating

**Table 2.** Descriptors and numbers of articles found in Medline.

Descriptors	Number of articles found
"Fibromyalgia" and "facial pain" and "Temporomandibular joint disorders"	1
"Fibromyalgia" and "temporomandibular joint disorders"	30
"Fibromyalgia" and "craniomandibular" and "temporomandibular joint disorders"	0
"Temporomandibular" and "facial pain"	24

### Screening process articles

Initially, the articles were selected for the title and summary according to the search strategy described. Articles that have appeared in more than one database were considered only once. The titles were reviewed by two reviewers (H.A, A.K.L), regardless, and the ones that were interesting for this research had summaries read, or if the summary was insufficient the full article was read. In case of disagreement, a third reviewer was consulted to decide if the article would be included or not in the review. The paper older found was 2012.

### Search result of articles

Table 3 represents a brief view of the search results of the articles which were found, excluded and finally were selected to review.

**Table 3.** Number total of articles found, excluded and selected to review.

Found in Pubmed	94 articles
Found in Medline	55 articles
Total articles found	149 articles
Excluding the duplicity	50 articles
Deleted after reading the title	30 articles
Deleted after reading summaries	14 articles
Selected articles	07 articles

## Results

The results of the review are shown in Table 4. Most patients with fibromyalgia are prone to develop temporomandibular dysfunctions. Similarly, TMD patients are more sensitive to fibromyalgia, indicating the need for integrated diagnosis and treatment of these patients, which suggest that the FM could be a medium- or long-term risk factor for the development of TMD. On average, the selected studies tested 57 patients, where most were females. The studies showed the importance of the multidisciplinary diagnosis, involving professionals from different areas to obtain better treatment.

## Discussion

Fibromyalgia and Temporomandibular dysfunctions are diseases considered distinct from each other, but recent studies have shown the correlation between the two, first because they are considered chronic pain diseases and with an uncertain etiology and also by Presenting similar clinical symptoms like pain in the chewing muscles, in the cervical muscles, difficulty in opening the mouth, joint noises, among others. It is not known exactly why the clinical manifestations of TMD in patients with FM, but it is believed that generalized pain predisposes the onset of dysfunctional pain [8,7]. The study Gui et al., [2] evaluated the muscular activity using electromyography in women diagnosed with FM and others with TMD, the results showed muscular fatigue in both groups and difficulty to perform an efficient muscular contraction without pain. However, the nociceptors of patients with FM seem to be more sensitized to pain than those of patients with TMD, making the patient with FM feel pain with a lower muscle workload.

When assessing painful symptoms in a group of patients with FM, Moya et al., [1] showed the prevalence of TMD signs and symptoms, such as pain at palpation of the facial and cervical muscles and also a limitation in mouth opening. This agrees with the results of Pimentel et al., [5] which discussed the discomfort reported by patients with FM in the temporal muscles, masseter, TMJ region and other sites of the head. Patients diagnosed with FM present diffuse and chronic pain, it is believed that this persistent stress in the body can alter the sympathetic activity and its way of reacting to pain [3].

Pain in patients with FM is localized mainly in the cervical muscles, while pain in TMD patient's manifests in areas of the face, involving the chewing muscles. This can be understood through pathophysiological mechanisms, in which patients with TMD have a greater sensitization of trigeminal neurons than patients with FM presenting spinal sensitization [9]. Despite the apparent differences in the distribution of pain, similarities between these pain syndromes are observed, such as the presence of pain-sensitive muscle points in more than one muscle [10].

There are several causes for the pain, one of which is deregulation in the mechanism of endogenous analgesic substances associated with nerve fibers sensitivity. The study by Janal et al. [11] tested the temporal sum and post sensation of stimuli in patients who reported facial pain for at least one year, the test was also performed in participants without pain. The objective was to evaluate the late sensations from C-nociceptive fibers and to observe if some repetitive stimulus becomes more painful. At the end of the test, as shown in Table 1, the case groups had difficulty in having a reduction in pain after stimuli. In an attempt to offer a better therapeutic approach to the two dysfunctions, Fernández et al. [9] sought to understand in its study the pathophysiology of pain in FM and TMD. It was perceived that patients with FM have nociceptive hypersensitivity of the central nervous system; this causes the stimuli that could cause minimal pain to have a different response. From the painful continuous stimuli that reach the CNS, pain-causing substances that will eventually

result in muscular oxidative stress are released and, therefore, trigger dysfunctions as TMD.

**Table 4.** Results of author/year, goal, group of people and method of evaluation of articles found in the review.

Author/Year	Goal	Group of people	Method of evaluation	Relationship between TMD and FM
Fraga et al, 2012	Determine the frequency of signs and symptoms of temporomandibular disorder (TMD) in fibromyalgic patients.	60 subjects (mean age, 49.2), 52 women (49.8) and 8 men (45.8) with symptoms of TMD (facial pain, bruxism, headache, chewing difficult, pain, or morning stiffness on the mouth and joint sounds)	It was used a systematically translated Brazilian version of the RCD for TMD (RDC/TMD Axis I).	There is a high prevalence of signs and symptoms of TMD in FM patients, indicating the need for integrated diagnosis and treatment of these patients.
Gui et al., 2013	Evaluate patients diagnosed with fibromyalgia associated with TMD and check the muscular activity of these patients using electromyographs.	27 female patients diagnosed with fibromyalgia and TMD were willing to participate in the study.	The patients were examined and diagnosed by means of the diagnostic criteria for temporomandibular disorders (RDC/TMD). The activity of the electromyography was recorded simultaneously by four electrodes fixed in the masseter and temporal muscles.	FM appears to have a series of characteristics that constitute predisposing and triggering factors for TMD.
Pimentel et al., 2013	Evaluate patients with FM associated with TMD in comparison with a control group of healthy people to chronic facial pain.	Two groups: 40 female patients diagnosed with FM and TMD and 40 healthy female patients. There was no difference in age range and oral condition among patients.	In the case group, all patients had the previous diagnosis of FM based on the criteria of the American College of Rheumatology. In the control group, no patient was diagnosed with FM or chronic pain for at least three months before the study. All patients were examined by a single dentist calibrated according to the RDC/TMD.	Classic signs of TMD, such as joint noise and self-reporting of clenching at night, are not associated with fibromyalgia syndrome as demonstrated in the current study. This study revealed specific muscle involvement of TMD is also a presence in FM.
García- Moya et al., 2015	Evaluate the differences of the painful symptoms in patients with FM and a control group.	In total, 38 people participated in the sample. of which 20 were the cases and 18 the controls.	The cases were selected through an FM association and the patients in the control group were from different dental offices. The TMD screening questionnaire was from the American Academy of Orofacial Pain, where all patients answered the basic questionnaire of ten questions.	Patients with FM are affected to a greater extent by craniomandibular disorders, with lower mouth opening and higher pain levels than healthy persons.
Fujarra et al., 2016	Evaluate signs and symptoms of TMD in two groups of patients with FM, according to the temporal relationship of the appearance of dysfunction.	In total 53 women participated, they were divided into 2 groups. Group A: Women who were diagnosed with TMD before the diagnosis of FM. Group B: Women diagnosed with FM before the diagnosis of TMD.	The participants were evaluated according to the criteria of the American College of Rheumatology classification.	All patients had temporomandibular joint symptoms, mainly muscle disorders. The prevalence of myofascial pain with limited mouth opening and right TMJ disc displacement with reduction was higher in onset of facial pain preceded generalized body pain.
Moreno-Fernández et al., 2017	Review the pathophysiological process of both, fibromyalgia and TMD seeking to identify their similarities.	-	Clinical studies were selected for comparison between patients with a clinical picture of both Fibromyalgia and TMD.	Fibromyalgia and temporomandibular disorders with muscle pain both have profiles that affect the muscular system and therefore share many epidemiological, clinical, and physiopathological symptoms.
Janal et al., 2016	The study had two objectives: to determine the central pain sensitization in patients with TMD as a manifestation of FM and evaluate reports of post sensations after the sum of repetitive and painful stimuli.	The study obtained the participation of 168 women, of which 125 were the cases (with TMD or TMD associated with FM) and 43 were the controls (healthy for these dysfunctions).	All participants were evaluated according to the ACR criteria for the diagnosis of fibromyalgia and also according to the RDC/TMD criteria for the diagnosis of TMD.	All myofascial TMD cases were characterized by a similar delay in the decay of AS. The central sensitization (temporal summation) failed to suggest different pain maintenance factors in myofascial TMD cases with and without FM.
Losert-Bruggner et al., 2018	Evaluate patients with chronic pain and/or craniomandibular craniocervical, but no diagnosis for fibromyalgia.	199 men and 356 women, of whom 63% (351 patients) met the criteria for the diagnosis of Fibromyalgia.	The diagnostic criteria were defined according to the RDC/TMD and the International Cranio-Mandibular College, which offer a complementary diagnosis within the neuromuscular approach.	It must be assumed that FM is a crucial factor in the formation of craniomandibular dysfunction and craniocervical dysfunction.

It is known of the importance of professionals such as the rheumatologist and the dentist in the diagnosis and follow-up of patients with these dysfunctions, the study by Brigitte et al. [12] showed the relevance of orthopedics involved also in the treatment of FM associated with TMD when he researched the possible relationship of these two with craniocervical dysfunction. She conducted her research with more than 500 patients who had never previously received the diagnosis of FM but suffered from some craniomandibular or craniocervical dysfunction. At the end of the study, 63% of the patients had positively fulfilled the diagnostic criteria for FM and this says a lot about the complexity of these diseases and also the importance of interdisciplinarity among the professions [4].

It is important to assess which pain predisposed the other, facial pain or bodily pain. In his article, Fajarra et al. [6] sought to identify and describe the complaints of patients with FM and observed that in most cases the same symptoms of patients with TMD are reported. In this case, the coexistence of the two is real and is still underestimated by professionals, not being thought of as an integrative treatment. FM needs to be considered in the clinical management of TMD, since the lack of identification of comorbidities may lead to the inability to reduce the patient's pain [4,7]. In addition, treating these disorders requires observation of the patient's lifestyle so that habits are changed and collaborate with the improvement of the painful symptomatology [8,13].

In addition to Fibromyalgia, Temporomandibular dysfunctions may be associated with other diseases. In the cross-sectional study by author Blini et al., [14] the bruxism was identified in at least 50% of patients who reported TMD symptoms, suggesting a certain correlation between these dysfunctions as well. The pathophysiological mechanisms of TMD pain may trigger primary headache, Kemper's studies, Okeson 1983 have shown that the majority of patients seeking treatment for TMD report symptoms of migraine and tension-type headache [15].

## Conclusion

Within the limitations of this review, it is possible to observe that all the selected studies affirm that there is a positive correlation between FM and TMD. Both affecting the musculoskeletal system and presenting resembling clinical characteristics. Therefore, it is relevant that patients with these dysfunctions have a multidisciplinary follow-up.

## Disclosure Statement

The authors report no conflicts of interest.

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