Temporomandibular Disorders: Assessment of the Knowledge and Current Practices of Senegalese Dentists

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Abstract

Introduction: Temporomandibular Disorders (TMD) is a generic term encompassing a group of musculoskeletal and neuromuscular disorders. The aim of our study was to assess the evolution of knowledge and current practices of Senegalese dentists regarding temporomandibular disorders, and to measure any disparities in diagnostic and treatment methods.

Materials and methods: A cross-sectional descriptive study was conducted in the form of a declarative survey by anonymous questionnaire among a cohort of Senegalese dentists. A questionnaire was administered to 373 Senegalese dentists to assess their knowledge and professional practices regarding TMD (etiopathogenesis, clinical and paraclinical investigations, and appropriate treatment).

Results: Of the 373 dentists selected, 151 responded, representing a response rate of 40.5%. Occlusal abnormalities were identified as the major aetiology of TMD by a large proportion of respondents (86.8%; n= 131). Among the clinical signs that point to the diagnosis of this condition, joint noises (89.4%) were the most frequently cited in the practitioners' responses, and 63.6% thought that an orthopantomogram was the reference paraclinical examination for confirming the diagnosis. Regarding treatment, occlusal splints (96%) and muscle relaxant drugs (84.4%) were the therapies most prescribed by practitioners, while only 9.3% thought of cognitive-behavioural therapy as a means of treating TMD.

Conclusion: The results of this study show that the knowledge of Senegalese dentists and their professional practices are inadequate and underline the need to disseminate new knowledge concerning the aetiologies, pathophysiology, diagnosis and management of TMD.

Keywords: Temporomandibular disorders; musculoskeletal pain; joint noises; disc displacement; cognitive-behavioural therapy.

List of Abbreviations: TMD: Temporomandibular Disorders; TMJ: Temporomandibular Joint; NOSD: National Order of Senegalese Dentists; ADAM: Painful Temporomandibular Disorders; DCM: Craniomandibular Disorders; SADAM: Algo--Dysfunctional Syndrome of the Manducatory Apparatus; MRI: magnetic resonance imaging; NSAIDs: Non-Steroidal Anti-Inflammatory Drugs.

Introduction

Temporomandibular disorders (TMD) are a general term for all neuromuscular and musculoskeletal disorders of the masticatory muscles, temporomandibular joint (TMJ) and adjacent structures [1]. TMD is the most common form of non-dental orofacial pain, affecting mainly women and people aged between 20 and 45 years [2,3]. The most common clinical features are chronic myofascial pain, pain in the masticatory muscles, limited range of mouth opening and joint noises [4-7]. However, other symptoms such as earache, headache, neuralgia and toothache may also be present [8,9]. Although the aetiology of TMD is complex, it is probably multifactorial, involving biomechanical, neuromuscular, neurophysiological, psychosocial and biological influences. Plausible causes include trauma, abrupt change in function, parafunctional habits, occlusal overload, increased joint friction, depression, stress and anxiety [10-12]. The role of each of these potential components is still controversial, and they may contribute either independently or collectively [13]. The difficulty in some cases of TMD is to correlate clinical symptoms with the type of TMD without recourse to imaging. It was found that the type of TMJ noise correlated significantly with the degree of disc displacement. Rounded and folded disc deformities caused crepitus, which was a sign of an advanced stage of anterior disc displacement without reduction. Palpation tenderness of the lateral pterygoid muscle was noted in cases of anterior disc displacement with or without reduction. The more distorted the TMJ disc was on MRI, the greater the clinical signs and symptoms. Thus, diagnostic methods such as MRI should be used in difficult cases to diagnose pathological conditions of the TMJ. TMD treatments are classified into three categories: non-invasive, minimally invasive and invasive. Although each of these treatment modalities shows favourable results in reducing TMJ pain, no specific therapy has been shown to be more effective than another [14,15]. Furthermore, one of the determining factors in the successful treatment of TMD, which is often overlooked, is the practitioner's knowledge and skills regarding the disorder itself. As a result, patients are often misdiagnosed and undergo a variety of therapies for unrelated disorders, often resulting in frustration, dissatisfaction and reduced quality of life [16].

Porto et al. developed a questionnaire to meet current standards of diagnosis and treatment. The aim was to assess changes in knowledge and professional practice regarding TMD [17].

At present, no study has been carried out on this subject in Senegal.

The aim of our study was to assess the state of knowledge and current professional practices of a cohort of Senegalese dentists regarding TMD, and to measure any disparities in diagnostic methods and treatment.

Materials and Methods

Study Design

This was a descriptive, cross-sectional, observational study carried out in the form of a declarative survey of Senegalese dentists using anonymous questionnaires.

Questionnaire

A literature search on current knowledge of TMD enabled us to collect the most scientifically validated data on them and to draft a questionnaire. We were inspired by the questionnaires used in the literature [17,18]: number of questions, wording, interpretation

of results. We were thus able to draw up a simplified questionnaire adapted to our study, comprising 12 questions grouped into 7 different categories: socio-demographic and professional characteristics of the practitioners assessed (Q1 to 5), current terminology of TMD (Q6), knowledge support of TMD (Q7), current state of knowledge on the aetiologies of TMD (Q8), clinical and paraclinical investigations to be carried out to diagnose TMD (Q9 to 10), diagnosis of the 12 most frequent TMD (Q11), therapeutic management of TMD (Q12).

The questionnaire was tested with 7 dentists (practitioners not included in the study) before being finalized.

Study Population

The cohort of dentists studied corresponded to a list of 493 dentists provided by the National Order of Senegalese Dentists (NOS-D). The list of practitioners obtained from the NOSD contained the following information: surname and first name of the practitioners, e-mail address and physical address (WhatsApp, telephone number). The final number of dentists selected was 373.

Distribution of the Questionnaire

The questionnaire was distributed by e-mail and WhatsApp using Google Forms software. The e-mail included a link to the questionnaire.

The first distribution of the questionnaire was carried out on 16 September 2020 and follow-ups were made. The response collector closed at 00:00 on 24 January 2021.

The distribution options for this questionnaire were as follows: only one participation in the survey possible, impossible to transfer the questionnaire to another address. Questions 1 to 8 required a response and questions 9 to 12 were multiple choice.

Data was collected in a transparency process. Each participant received an anonymized questionnaire. The data confidentiality option was as anonymous as possible per participant to ensure data protection. This is the option that was chosen in the software: "Enable anonymous responses, exclude all participant information (name, email addresses, WhatsApp number and personalized data) from our survey results".

Finally, before being distributed, the survey was declared to and authorised by the NOSD.

Data analysis

The data collected was transferred to an Excel file for analysis. Google Forms software was also used to produce percentages and graphs compiling the results. The results were expressed as headcounts and percentages.

Results

Out of 373 questionnaires that were sent either by WhatsApp or e-mail to Senegalese dentists registered on the table of the NOSD, 151 responded, representing a response rate of 40.5%. Our sample was made up of 55% men and 45% women. The most represented age group was between 25 and 29 years (26.5%), followed by between 37 and 45 years (25.8%). Many dentists (55.6%) surveyed were in private practice. In terms of terminology, practitioners were more familiar with the name SADAM (91.4%). However, 29.8% of dentists said they knew the condition as TMD (Figure 1). Many of them (93.3%) were familiar with this condition from their initial training, regardless of the terminology used.
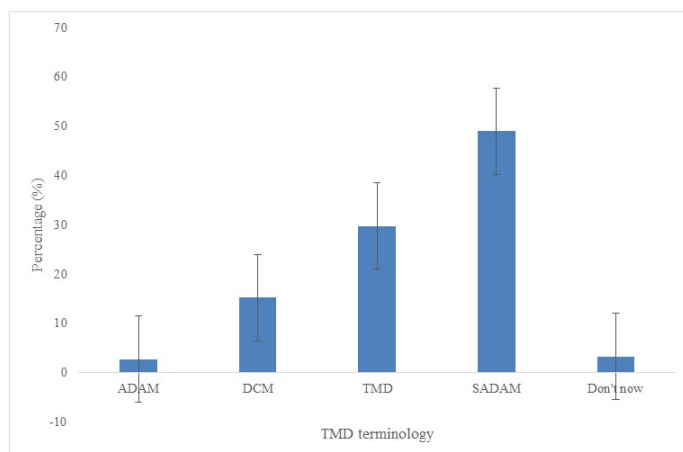
Figure 1: Distribution of dentists according to knowledge of TMD terminology

ADAM: Painful Temporomandibular Disorders; DCM: Craniomandibular Disorders; TMD: Temporomandibular Disorders; SADAM: Algo--Dysfunctional Syndrome of the Manducatory Apparatus.

Aetiologies of TMD

Occlusal abnormalities were identified as the major aetiology of TMD by a large proportion of respondents (86.8%; n= 131). This was followed by parafunctions (29.8%). Only 17.9% thought of chronic musculoskeletal pain (Figure 2).
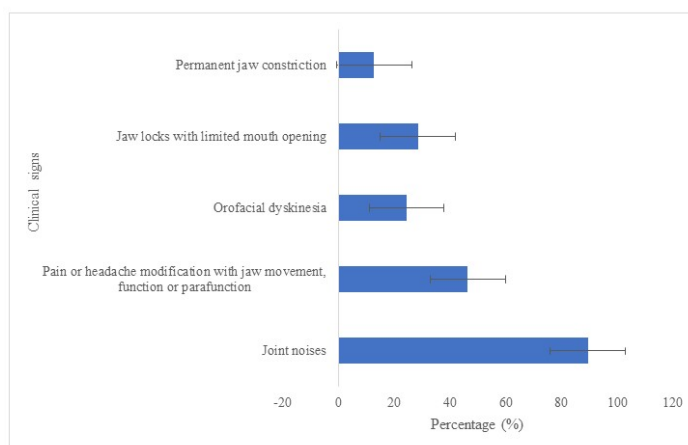

Figure 2: Distribution of dentists according to the clinical signs searched for the diagnosis of TMD

Occlusal abnormalies: anterior open bite; posterior edentulism, malocclusion; unilateral molar crossbite; an offset of more than 2 mm between centric and maximum intercuspid bite (ORC/OM); a horizontal incisal overhang of more than 7 mm.

Chronic musculoskeletal pain: related to direct shock; indirect trauma; repeated microtrauma; muscular pain attributed to systemic or central pain disorders.

Psychosocial factors: stress; anxiety.

Parafunction: bruxism; oral ventilation; posture.

Systemic and genetic pathologies: ligament hyperlaxity; degenerative joint disease (osteoarthrosis); aplasia; hypoplasia; hyperplasia.

Joint disorders: disc disorders; hypo and hypermobility disorders.

Clinical Signs and Paraclinical Diagnosis Methods for TMD

Among the clinical signs that point towards a diagnosis of this condition, joint noises (89.4%) were the most frequently cited by practitioners, and 63.6% thought that an orthopantomogram was the reference paraclinical examination for confirming the diagnosis. Orthopantomogram as the radiographic assessment most familiar to participants, other investigation methods were reported by practitioners, such as CT scans (61.6%) and MRI, which is the reference standard for diagnosing joint pathologies, was reported by only 37.7% of practitioners (Figures 3 and 4).
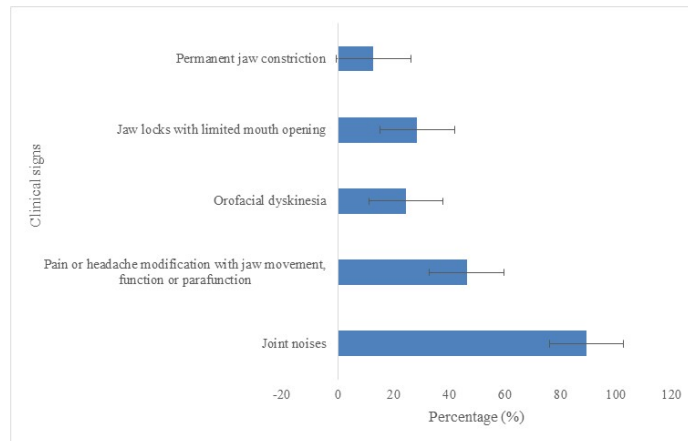
Figure 3: Distribution of dentists according to the clinical signs searched for the diagnosis of TMD
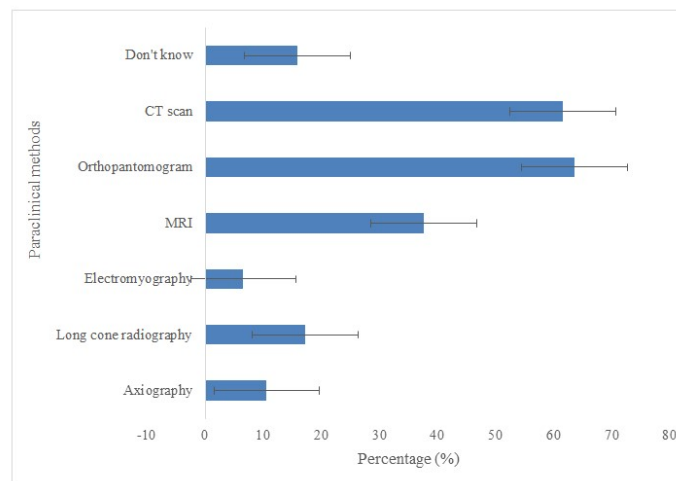
Figure 4: Distribution of dentists according to the paraclinical methods for the diagnosis of TMD

Diagnosis of the 12 Most Frequent TMD

None of the responding dentists identified disc displacement with reduction with intermittent locking, disc displacement without reduction without limited opening and subluxation as being among the 12 most common TMD. Over 62.9% of the practitioners surveyed thought that headache attributed to TMD was the first most frequently encountered TMD (Figure 5).
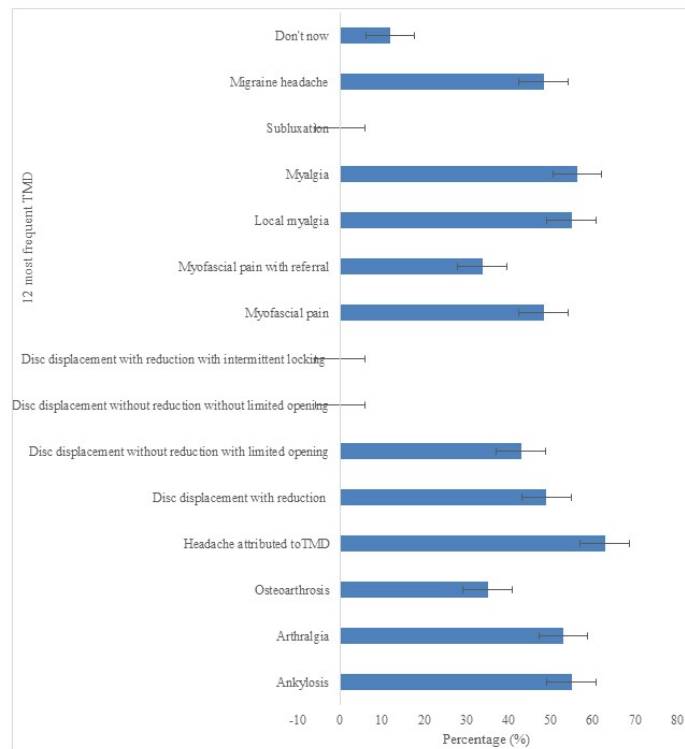
Figure 5: Distribution of dentists by diagnosis of the 12 most frequent TMD

Therapeutic Management of TMD

In terms of therapeutic management, occlusal splints (96%) and muscle relaxant drugs (84.4%) were the therapies most prescribed by practitioners, while only 9.3% thought of cognitive-behavioural therapy as a means of treating TMD (Figure 6).
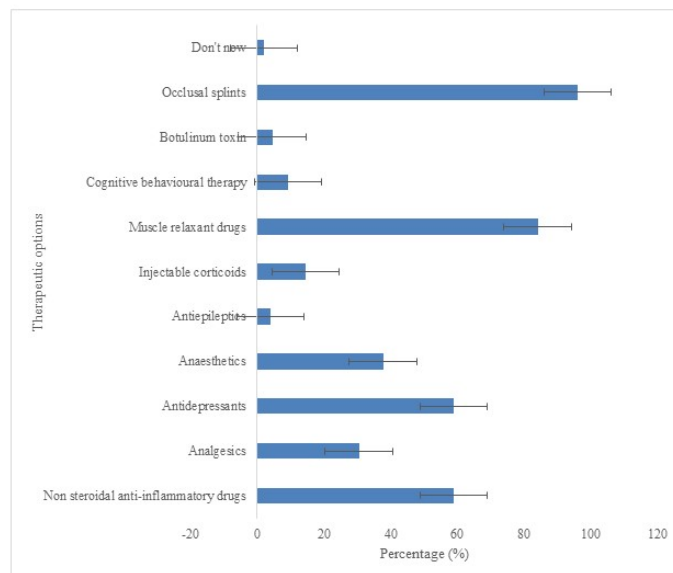

Figure 6: Distribution of dentists according to the therapeutic options of TMD

Discussion

This study of TMD highlighted an overall lack of knowledge among Senegalese practitioners. Such conclusions had also been reported in other studies. These studies judged the knowledge of dental surgeons and their professional practices to be insufficient [17-19].

In our study, awareness of the Algo-Dysfunctional Syndrome of the Manducatory Apparatus (SADAM) name was higher among practitioners (91.4%; n=138). Many Senegalese dentists continued to use this term. The term "Temporomandibular Disorders (TMD)" is now used in the international classification to describe a range of musculoskeletal conditions involving the TMJ, masticatory muscles and associated tissues [1].

Occlusal abnormalities were identified as the major aetiology of TMD by a large proportion of respondents (86.8%; n= 131). Occlusal factors are the best known, but also the most debated. It would be simple to think that if occlusion has an impact on function, malocclusion influences dysfunction. But epidemiological studies on this subject have not produced conclusive results. Occlusal factors are poorly correlated with TMD: their contribution is thought to be only 10 to 20% [20,21,22]. Moreover, many patients suffering from malocclusion do not present TMD and vice versa [20,21,22]. The involvement of occlusal factors in the development of TMD, although influencing a small number of patients, should not be overestimated [23].

However, some malocclusions are more frequently encountered than others in patients suffering from TMD, as the manducatory system is more tolerant in the sagittal direction. A 1993 study by Pullinger et al. identified five malocclusions: posterior edentulism, unilateral molar crossbite, an offset of more than 2 mm between centric and maximum intercuspid bite, a horizontal incisal overhang of more than 7 mm, and an anterior open bite. Dentists, particularly orthodontists, occlusodontists and physiologists, should recognize how the occlusion can become a risk factor for TMD and incorporate an orthopaedic approach in cases of TMD symptomatology to establish both condylar and occlusal stability [24]. Only 17.9% of practitioners thought that chronic musculoskeletal pain was a risk factor for TMD. This chronic pain is often due to trauma. A direct shock or indirect trauma can cause temporomandibular joint disorders. Trauma can be divided into macrotrauma (e.g. whiplash injury) and microtrauma (e.g. parafunctional habits) [25,26]. Traumatic micro-lesions of masticatory muscle fibres release local inflammatory mediators such as bradykinin, prostaglandins, substance P and histamine. These substances can transmit nociceptive impulses to the central nervous center, triggering both peripheral and central sensitisation [27]. Trauma has been defined as a predisposing or initiating cause of TMD [25,26]. A study of 400 patients with TMD found that TMJ pain was directly related to a positive history of trauma in 24.5% of patients [28]. However, there is no scientific evidence that treating TMD patients with a history of trauma is more difficult than treating TMD patients without trauma [29]. Other predisposing risk factors such as parafunctions and psychosocial disorders, which create a "bed" for TMD, were mentioned by only 29.8% and 29.1% of practitioners respectively. Parafunctions are one of the main proven causes of TMD. Examples of parafunctions include bruxism, onychophagia, chewing gum, lip or nail biting and non-nutritive sucking [29,30]. One study showed that excessive chewing of gum (more than 4 hours per day) is positively correlated with joint pain and snapping or tensing. It should also be noted that 87.5% of people suffering from painful disc displacement and TMD are bruxers [29,31]. Psychosocial factors were mentioned by 29.1% of dentists, since TMD are somatic and psychological disorders accompanied by fatigue, sleep disorders, anxiety and depression. Psychological problems (e.g. depression and anxiety) can cause stress to the TMJ and masticatory muscles via stimulation of the sympathetic nervous system [32].

Of the clinical signs that point towards a diagnosis of this condition, joint clicking (89.4%) was the most cited in practitioner responses. Snapping occurs when the condylar head protrudes beyond the edge of the displaced disc joint during opening and/or closing of the mouth. Therefore, clicking alone is not an indication for treatment of TMD. However, when clicking is observed, a detailed clinical assessment should be carried out. This includes assessment of the occlusion, detection of occlusal interference, palpation of the joints and assessment of the masticatory muscles [1]. To confirm the diagnosis of TMD, 17.2% of practitioners thought they would carry out a long cone scan, which proves the lack of knowledge of some practitioners about TMD. A further

63.6% thought that the orthopantomogram was the reference paraclinical examination for confirming the diagnosis. Although panoramic radiography is the most common initial diagnostic tool in dentistry, it cannot rule out significant morphological abnormalities of the TMJ. Specifically, due to the superposition of the base of the skull and the zygomatic arch, only excessive alterations of the articular tubercle can be observed. As a result, bony changes, such as erosions and osteophytes, are difficult to detect on conventional radiographs. Cone-beam computed tomography (CBCT) is considered superior to 2D radiography for illustrating condylar head morphology and assessing the presence of condylar deformities, such as osteoarthrosis. On the other hand, magnetic resonance imaging (MRI) is the recommended imaging modality for assessing the disc-condyle relationship, soft tissues and for diagnosing disc displacement [1]. However, only 37.7% of respondents mentioned MRI as a means of diagnosing TMD. Apart from the orthopantomogram, imaging techniques (CT scan/MRI) are not used systematically. They are essentially limited to intracapsular pathologies and differential diagnosis. In the case of intracapsular pathologies, MRI remains the complementary examination of reference.

Regarding the treatment of TMD, occlusal splints (96%) were the therapies most prescribed by practitioners. The relationship between occlusal interferences and TMD is not yet the subject of consensus in the literature. Currently, the very low-quality evidence identified has not demonstrated that occlusal splints reduce pain in TMD as a group of conditions. There is insufficient evidence to determine whether or not occlusal splints also reduce tooth wear in patients with bruxism [33]. For pharmacological treatment of TMD, 30.5% of practitioners prescribed analgesics, 58.9% NSAIDs, 58.9% antidepressants, 4% antiepileptics and 84.4% muscle relaxant drugs. Only 9.3% were considering cognitive behavioural therapy as a means of treating TMD. Pharmacological treatment for painful TMD includes non-opioid analgesics (acetaminophen), mild opioids (tramadol hydrochloride), NSAIDs (ibuprofen and diclofenac) and/or muscle relaxant drugs (tetrazepam). Pro Re Nata (PRN) narcotics may be prescribed to relieve the symptoms of acute pain when non-steroidal anti-inflammatory drugs are contraindicated. In all cases, it is imperative to carefully select patients before prescribing [34]. Conservative treatments, including counselling, exercises, occlusal splints, massage and manual therapies, should be considered as a first-choice therapy for TMD pain due to the low risk of side effects. In cases of severe acute pain or chronic pain resulting from inflammation, pharmacotherapy may be considered. Minimally invasive and invasive procedures should only be considered for severe disorders and/or degeneration [34,35].

Limitations

The use of questionnaires to collect data has important limitations, such as poor adherence by participants, which reduces the number of responses. In this study, the response rate was 40.5%. In a previous study, thirty-four TMD dentists (54.8% response rate) and three TMD psychologists (15.7% response rate) responded to the online questionnaire [17]. In our study, the second stage involved using email addresses and WhatsApp to collect responses from dentists. Those who use the internet most frequently are more likely to respond to emails and have access to social networks (WhatsApp). However, some dentists are reluctant to use social networks and rarely consult their email address, which probably explains our 40.5% response rate.

Conclusion

The results of this study show that the knowledge of Senegalese dentists and their professional practices are inadequate and highlight the need to disseminate new knowledge concerning the aetiologies, pathophysiology, diagnosis and therapeutic management of TMD. Continuing professional development workshops are needed to update dental surgeons' knowledge of temporomandibular disorders.

Conflict of Interest

Authors of this study have no conflict of interest.

Acknowledgments

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