Retrospective review of patients referred to a temporomandibular dysfunction care setting of a Brazilian public university

Revisão retrospectiva de pacientes encaminhados a um serviço de disfunção temporomandibular de uma universidade pública brasileira

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ABSTRACT

BACKGROUND AND OBJECTIVES: The objective of this study is to describe the restrospective analysis of medical records of patients with temporomandibular disorder in a healthcare service of a Brazilian public university. The prevalence of signs and symptoms of temporomandibular disorder, associated factors, diagnosis and observations related to the treatment were recorded.

METHODS: Two hundred and thirteen medical records were assessed by one single surveyor from March 2013 to December 2014. Information about sociodemographic factors, prevalence of symptoms of temporomandibular disorder and treatment need were collected (Fonseca Anamnestic Index), clinical examination, diagnosis, treatments and referral to other professionals.

RESULTS: The majority of patients were female (81.7%), single (53.0%), students (23.3%) between 20 and 29 years of age (26.8%). Pain was reported by 50.4% of patients. According to FAI, 41.8% of patients were classified with severe symptoms of temporomandibular disorder and 73.2% identified with the need of treatment. Presence of temporomandibular disorder symptoms (p = 0.001) and need of treatment (p <0.001) were significantly associated to the female gender. The most prevalent diagnosis was muscle temporomandibular disorder (41.5%) and the most affected muscle was the masseter (21.3%). The most common treatments were occlusal splint (27.6%) and counseling (22.6%).

CONCLUSION: The greater demand for temporomandibular disorder treatment came from young patients, single, female, complaining from pain. The prevalence of temporomandibular disorder symptoms was high, muscular disorders was the most prevalent findings and most of the treatments were reversible and conservative. The frequency of referral to other specialties related to temporomandibular disorder was low.

Keywords: Temporomandibular disorder, Orofacial pain, Epidemiology.

RESUMO

JUSTIFICATIVA E OBJETIVOS: O objetivo deste estudo foi descrever a análise retrospectiva de prontuários referentes a um serviço de atendimento a pacientes com disfunção temporomandibular em uma clínica de ensino de uma universidade pública brasileira. A prevalência de sinais e sintomas de disfunção temporomandibular, fatores associados, diagnósticos e observações relacionadas ao tratamento foram registrados.

MÉTODOS: Duzentos e treze prontuários foram avaliados por um único examinador no período de março de 2013 a dezembro de 2014. Coletou-se informações sobre fatores sócio-demográficos, prevalência de sintomas de disfunção temporomandibular e necessidade de tratamento (índice anamnésico de Fonseca), exame clínico, diagnósticos, tratamentos e encaminhamentos para outros profissionais.

RESULTADOS: A maioria dos pacientes era do sexo feminino (81,7%), solteira (53,0%), estudantes (23,3%) e entre 20 e 29 anos (26,8%). A dor foi relatada por 50,4% dos pacientes. De acordo com o índice FAI, 41,8% dos pacientes foram classificados com sintomas graves de disfunção temporomandibular e 73,2% identificados com necessidade de tratamento. Presença de sintomas de disfunção temporomandibular (p = 0,001) e necessidade de tratamento (p <0,001) foram significativamente associadas ao sexo feminino. O diagnóstico mais prevalente foi disfunção temporomandibular muscular (41,5%) e o músculo mais afetado foi o masseter (21,3%). Os tratamentos mais comuns foram placa oclusal (27,6%) e aconselhamento (22,6%).

CONCLUSÃO: A maior demanda por tratamento para disfunção temporomandibular foi de pacientes jovens, solteiros, do sexo feminino, com queixa de dor. A prevalência de sintomas de disfunção temporomandibular foi alta, os distúrbios musculares foram os achados mais prevalentes e a maioria dos tratamentos foi reversível e conservadora. A frequência de encaminhamentos para outras especialidades relacionadas à disfunção temporomandibular foi baixa.

Descritores: Desordem temporomandibular, Dor orofacial, Epidemiologia.

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INTRODUCTION

According to the American Academy of Orofacial Pain (AAOP), temporomandibular disorder (TMD) is described as a group of clinical problems that affect the masticatory muscles, the temporomandibular joint (TMJ), and related structures[1]. It is characterized as pain and fatigue of the masticatory muscles, TMJ pain, headache, otalgia, clicking, and limitation of mandibular movements[2,3].

The etiology of TMD is multifactorial, with numerous contributing factors, such as parafunctional habits (e.g. gum chewing, "jaw play", leaning of the head on the palm of the hand or arm and biting objects)[4-6], direct and indirect traumas, psychosocial and psychological factors, and genetic factors[1,6-10]. Other factors, such as sleep bruxism (SB)[11,12], awake bruxism (AB)[13], sleeping in the lateral decubitus position[14] and some occlusal factors have also been associated with the presence of TMD signs and symptoms[15].

The study of this disorders in public health has gained prominence due to its increasing and early incidence in the population, besides its association with the psychological aspects and its capacity to affect the quality of life of the patients[9,16]. Regarding its prevalence, cross-sectional epidemiological studies have shown that approximately 40 to 75% of the adult population has at least one clinical sign of TMD[1]. Moreover, studies have shown that due to the wide variety of signs and symptoms[2,3,17], this disorder may cause functional and psychosocial harm, such as a decrease in quality of life in affected individuals[18,19], thus making it necessary to promote and expand access to adequate treatment for these patients[5,20].

Therefore, the evaluation of the services aimed at the treatment of patients with TMD is critical to enabling a better understanding of the epidemiological characteristics of the affected population, to improve planning strategies regarding the provision of services and the academic training on both theory and practice, and to foster strategies aimed at expanding care toward post-graduate services[21,22]. Moreover, these data may contribute to the generation of scientific knowledge through research to improve the understanding of the characteristics of this disorder[2,3,23].

Thus, the objective of the present study was to perform a retrospective analysis of patient records referred to a temporomandibular disorder service in a healthcare setting of a Brazilian public university that offers diagnostic and treatment services to patients with TMD and other orofacial pain disorders, as well as to describe the prevalence of signs and symptoms of TMD associated factors, diagnosis and treatment related observations.

METHODS

This study was performed at the TMD school clinic of the Division of Occlusion, Temporomandibular Disorder and Orofacial Pain, Department of Restorative Dentistry, Federal University of Paraíba (UFPB), João Pessoa, Paraíba, Brazil. This was a retrospective study that followed an inductive approach with a research method based on indirect documentation through the analysis of patient records[3,24].

A total of 213 patient records of patients attended at the service from March 2013 to December 2014 were evaluated. Patient records were numbered and audited by a single examiner and all fields were analyzed, including those with incomplete or absent data. Those that contained only the patient's identification were excluded. At the study site, patients are screened based on the Fonseca's Anamnestic Index (FAI). The FAI index enables the evaluation of the severity of TMD symptoms as well as the need for treatment based on the symptoms reported[8,11,25,26]. In contrast, the classification of TMDs was established based on medical history, clinical exam, and diagnostic imaging, as suggested by the AAOP[1,20]. Clinical exam consisted of measuring the maximum mouth opening (mm) with a caliper, and values were added to the overlap of the anterior incisive teeth, and mouth opening was classified as either normal (40-60 mm), restricted mouth opening (<40mm) and hypermobility (>60mm); the presence of joint sounds (clicking, popping or "thud" and crepitus); tenderness on TMJ palpation (lateral and posterior pole palpation under a pressure of approximately 0.5 kg/cm²); tenderness on palpation of the masseter, temporalis, medial pterygoid, sternocleidomastoid, trapezius, and posterior cervical muscles (pressure of approximately 1 kg/cm²);and performance of the provocation test or functional manipulation of lateral pterygoid muscles (resistive protrusion)[4,6,8,10,15,27–29].

SB was diagnosed based on the criteria of the American Academy of Sleep Medicine (AASM), as presented by Carra, Huynh and Lavigne[30] and Ommerborn et al.[31] according to patient history (recent patient, parent, or sibling report of tooth-grinding sounds occurring during sleep for 6 months) and clinical evaluation (one or more of the following: abnormal tooth wear; hypertrophy of the masseter muscles on voluntary forceful clenching; discomfort, fatigue, or pain in the jaw muscles and transient, morning jaw-muscle pain or headache). AB was evaluated using the question: 'During the day, do you grind your teeth or clench your jaw?' (Brazilian-Portuguese RDC/TMD questionnaire).[32] The clinical criteria proposed by Lobbezoo et al.[33], using a diagnostic grading system of 'possible', 'probable' and 'definitive' was employed, and, the diagnosis of SB or AB was categorized as "possible" (self-report) and "probable" (use of self-report plus the inspection by a clinical examination and the absence of polysomnographic and electromyographic records).

Other data were also collected from the analysis of patient records: sociodemographic factors (gender, age, marital status, profession, and city of residence); major reported complaints; prevalence of TMD symptoms and need for treatment by an anamnestic index (FAI index); self-report of parafunctional habits; sleeping position; occlusal characteristics (tooth wear, lateral and anterior guidance); TMD clinical evaluation; TMD diagnoses, according to the AAOP/IHS criteria; previous treatments and referral to professionals of other areas.

To analyze the subjective data obtained from medical records, such as the major complaint and diagnosis, a theme-categorical methodology with discursive analysis was used, which consists of transforming and grouping the narrative data into units, considering their relevance, frequency, and meaning[34].

The research was compliant with the criteria set by Resolution nº 466/2012 of the National Council of Health and approved by the Research Ethics Committee of the Health Sciences Center of the UFPB (CAAE: 39134314.3.0000.5188).

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Statistical analysis

Data were assessed using the Statistical Package for the Social Sciences (SPSS) software, version 22.0, and analyzed descriptively, with the frequency and percentages of the study variables computed. The chi-square (x^2) or Fisher's Exact test was used to test the associations between the study variables. For both tests, we set $p < 0.05$ as the statistical significance level.

RESULTS

Table 1 shows the sociodemographic characteristics of the evaluated sample. The majority of the patients were female (81.7%), between 20 and 29 years of age (26.8%), single (53%), students (23.3%), and residents of the city of Joao Pessoa (79.3%) or a metropolitan region. Pain (50.4%) and TMJ clicking (14.9%) were among the most prevalent complaints reported by the sub-

jects (Table 2). Notably, the present study grouped pain complaints into a single category that combined muscle pain, joint pain or headache.
Regarding TMD symptoms prevalence, 95.8% of the patients had TMD symptoms, in an initial trial performed by FAI Anamnestic Index. According to the FAI index, the majority presented "severe TMD" (41.8%). In the study sample, 73.2% of the patients were classified as "in need for treatment" (Table 3). The presence of TMD symptoms (p=0.001) and need for treatment were significantly associated with the female gender (p<0.001).
Regarding self-reported parafunctional habits, 58.2% (n=124) of the patients reported having such habits, with the most prevalent being fingernail biting (28.6%, n=39), leaning the head on the palm of the hand or arm (22.0%, n=30), object biting (20.6%, n=28), lip/cheek biting (16.2%, n=22), and gum chewing (8.8%, n=12). In addition, patients also reported tongue biting

Table 1. Sociodemographic characteristics of the study sample (n=213)

Variables	n	%
Gender		
Female	174	81.7
Male	39	18.3
Age range		
13-19	18	8.5
20-29	57	26.8
30-39	35	16.4
40-49	38	17.8
50-59	42	19.7
60-69	18	8.5
70-80	5	2.3
Marital status		
Single	113	53.0
Married	83	39.0
Divorced	15	7.0
Widower	1	0.5
Unknown*	1	0.5
Profession		
Student	50	23.3
Housewife	26	12.2
Civil servant	23	10.8
Retired	17	8.0
Teacher	13	6.1
Other professions**	78	36.8
Unknown*	6	2.8
City		
Joao Pessoa	169	79.3
Santa Rita	10	4.7
Bayeux	8	3.8
Cabedelo	4	1.9
Other cities***	22	10.3

* Absent data in the medical record; ** Professions reported by less than 10 patients; *** Cities reported by less than three patients.

Table 2. Frequency of the major reported complaints

Reported complaints	n*	%
Pain	155	50.4
TMJ clicking	46	14.9
Tooth wear	24	7.8
Chewing difficulty	18	5.9
Fatigue	16	5.2
Tooth grinding	15	4.9
Jaw locking	10	3.2
Difficulty in opening the mouth	5	1.6
Tingling sensation	3	1.0
Aperture deviation	2	0.6
Poorly adapted prosthesis	2	0.6
Tinnitus	2	0.6
Displaced mandible	1	0.3
Tooth crowding	1	0.3
Unknown **	8	2.7

* The sum is greater than 213 because a patient could report more than one complaint; ** Absent data in the medical record.

Table 3. Prevalence of temporomandibular disorders symptoms and the need for treatment according to the Fonseca index

Variables	n	%
TMD symptoms presence		
Absent	9	4.2
Present	204	95.8
TMD level		
No TMD	9	4.2
Mild TMD	46	21.6
Moderate TMD	69	32.4
Severe TMD	89	41.8
Need for treatment		
Absent	56	26.3
Present	156	73.2
Unknown*	1	0.5

* Absent data in the medical record.

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(1.5%, n=2), tongue thrust (1.5%), and prosthesis dislocation (0.7%). The sum of the habits above is greater than 124 because some patients could have reported more than one habit.

Regarding the occlusion assessment, 33.7% of the patients had evidence suggestive of tooth wear compatible with sleep bruxism (SB) (n=66) and 18.4% had evidence of tooth wear suggestive of AB (n=36). Functional facets and nail biting were present in 6.1% (n=13) and 0.9% (n=2) of patients, respectively. A sub-set of 28.6% of the patients did not exhibit tooth wear facets (n=61), and in 8.5% of the charts, this information was absent or the patient was unsure of this information (n=18). The prevalence of "possible" AB diagnoses (self-reported) was reported by 19.7% (n=42) of the patients and "possible" SB by 8.0% (n=17), although the diagnosis of "probable" (self-report plus clinical examination) resulted in smaller values of prevalence: 4.3% (n=9) for SB and 8.05% (n=17) for AB.

Canine guidance was the most prevalent disocclusion pattern for both the right and left sides (n=70, 32.9% for both sides), followed by incomplete group function on the right (n=65, 30.5%) and left (n=66, 31.0%) sides. The anterior guidance pattern was considered to be normal (including only the incisor teeth) for 38.5% of the sample (n=82). Regarding the sleep position pattern, 126 patients reported sleeping in the lateral decubitus position (59.2%), 36 slept in the prone position (16.9%), and 27 slept in the supine position (12.7%). This information was absent or the patient was unsure of this information in 24 of the charts (11.2%). Table 4 presents the data related to the TMD clinical exam. The majority of the patients had a normal maximum mouth opening (73.2%) and aperture pattern with deviation (43.1%). Articular sounds were present in 55.9% of the patients, with clicking (31.5%) and popping (17.4%) being the most prevalent. Tenderness at TMJ palpation was present in 53.1% of the patients, with most of these patients reporting pain in both TMJs (28.2%). Regarding muscle tenderness, 65.7% of the patients reported pain. The muscles that were most commonly affected were the masseter (21.3%), lateral pterygoid (17.9%), and sternocleidomastoid (16.0%).

Table 5 presents data related to the diagnosis of TMD based on the medical history, clinical exam, and diagnostic imaging. A set of 64.3% of the patients had a diagnosis of TMJ and/or muscular disorder, with masticatory muscle disorders (41.5%) and disk displacement with reduction (19.5%) being the most prevalent diagnoses. This information was absent in 20.6% of the charts.

Table 4. Frequency of data related to temporomandibular disorder clinical evaluation

Clinical exam	n	%
Maximum mouth opening		
Normal	156	73.2
Restricted mouth opening	45	21.2
Hypermobility	5	2.3
Unknown*	7	3.3
Mouth opening pattern		
Straight (normal)	68	31.9
Deviation	92	43.1
Deflection with aperture restriction	31	14.6
Deflection without aperture restriction	11	5.2
Unknown*	11	5.2
TMJ sounds		
Absent	84	39.4
Clicking	67	31.5
Popping	37	17.4
Clicking and popping	10	4.7
Crepitus	3	1.4
Clicking and crepitus	2	0.9
Unknown*	10	4.7
Tenderness on TMJ palpation		
Absent	95	44.6
Left and right TMJ	60	28.2
Only left TMJ	27	12.7
Only right TMJ	26	12.2
Unknown*	5	2.3
Tenderness on muscle palpation		
Absent	66	31.0
Present**	140	65.7
Masseter	101	21.3
Lateral pterygoid	85	17.9
Sternocleidomastoid	76	16.0
Temporal	74	15.6
Trapezius	66	13.9
Posterior cervical	42	8.8
Medial pterygoid	24	5.0
Occipitofrontalis	7	1.5
Unknown*	7	3.3

* Absent data in the medical record; ** The sum of patients with tenderness on muscle palpation is higher than 140 because a patient could report tenderness of more than one muscle.

Table 5. Prevalence of joint and muscle disorders (medical history, clinical evaluation, and diagnostic imaging)

Joint and muscle disorders	n	%
No clinical TMD diagnosis	19	8.9
With diagnosis*	137	64.3
Masticatory Muscle disorders**	83	41.5
Disc displacement with reduction	39	19.5
Capsulitis/synovitis	26	13.0
Retrodiscitis	16	8.0
Disc displacement without reduction	10	5.0
Subluxation (Hypermobility)	9	4.5
Adherence	8	4.0
Osteoarthritis	7	3.5
Osteoarthrosis	2	1.0
Absent information***	57	26.8

* The sum of the specific diagnoses is higher than 137 because a patient could have more than one diagnosis; ** Includes the following TMD muscle disorders: protective co-contraction, local muscle soreness, myospasm, myofascial pain and chronic centrally mediated myalgia; ***Absent data in the medical record; ** Data were absent or the patient did not know.

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The treatments and referrals are reported in Table 6. Occlusal splint (27.6%) and counseling (22.6%) were the most common treatments, while dental prosthesis (7.4%) and restorative dentistry (2.7%) were the most common referrals. Of important note is that the referrals to dental specialties were not necessarily for the treatment of TMD but rather due to the patient's needs in each specific area. Referrals to other specialties related to TMD, including physical therapy and speech therapy, were usually few.

Table 6. Frequency of treatments and referrals to other specialties

Variables	n*	%
Treatments performed at the study site		
Occlusal splint	121	27.6
Counseling	99	22.6
Pharmacologic therapy	70	16.1
Physical therapy with thermotherapy	23	5.3
Physical therapy with stretching	23	5.3
Occlusal adjustment	2	0.5
Unknown**	15	3.5
Referrals		
Prosthesis	32	7.4
Restorative dentistry	12	2.7
Oral and maxillofacial surgery	8	1.8
Orthodontics	6	1.4
Physical therapy	6	1.4
Endodontics	4	0.9
Speech therapy	4	0.9
Rheumatology	3	0.7
Neurology	3	0.7
Orthopedics	2	0.5
Otorhinolaryngology	2	0.5
Periodontics	1	0.2

* The sum is higher than 213 because a patient could receive more than one treatment and/or referral; ** Data were absent or the patient did not know.

DISCUSSION

In agreement with the current literature, the present study revealed that the majority of the patients were women[2-4,24] in the age range of 20 to 25 years (young adults)[8,35]. Moreover, women were significantly associated with the presence of TMD symptoms and with the need for treatment according to the FAI index. The reasons for the higher female TMD population are still controversial, although a few factors are suggested in the literature, such as the greater perception of pain among females, the higher incidence of psychological factors among females, physiological and hormonal differences, muscle structure differences, and women's greater concern about their own health compared with men[1,8,35]. The majority of patients in the sample were students, single, and residents of João Pessoa or its metropolitan area. A similar socio-demographic profile was demonstrated by Pimentel et al.[23]. Conversely, Dantas et al.[3] observed a higher prevalence of TMD among individuals in the age range of 41 to 60 years and with formal employment. These authors conducted their study in a teaching hospital where most of the patients were referred by dentists or physicians from primary care clinics and private practices. In contrast, our study was conducted at the teaching clinic of the Division of Occlusion, which is embedded in an academic environment. This location explains the greater search of the service by the population of interest. Several studies have demonstrated a high prevalence of TMD among university students[9,15,35,36] suggesting that this population is exposed to risk factors that promote the development of these disorders, such as emotional stress and anxiety[8,35].

Regarding the complaints reported, results are in agreement with previous studies, which showed pain as the most prevalent complaint[2,3,37]. This finding is relevant, as the current literature shows that the presence of pain is associated with a higher degree of impairment of individual and psychosomatic characteristics among patients with TMD, which negatively influences their quality of life related to oral health[3,18,19].

The FAI index data revealed that most patients presented severe TMD with need for treatment. These findings are explained by the fact that the present study was performed in a patient population. In contrast, epidemiological studies in non-patient populations have shown a high prevalence of mild TMD and lower values of patients in need of treatment[8,35,36,38].

Regarding the presence of habits, a large percentage of the patients reported at least one parafunctional habit (58.2%), with fingernail biting, leaning the head on the palm of the hand or arm and object biting being the most prevalent. Corroborating these findings, other studies also observed a high prevalence of parafunctional habits in patients with TMD[37,39]. Branco et al.[39] observed that 76.9% of patients with TMD had some parafunctional habit, while Carvalho et al.[37] showed a lower frequency (47%). Moreover, epidemiological studies in non-patient populations have also found a high prevalence of parafunctional habits in individuals with signs and symptoms of TMD[4-6,16,36].

Data from the present study also show that different prevalence values were found for "possible" and "probable" sleep and awake-bruxism. The diagnose of "possible" AB was reported by 19.7% of the patients, and "possible" SB by 8.8%, and the diagnoses of "probable" AB and SB was reported only by 8.05% and 4,3% of the patients, respectively. The prevalence of "possible" AB and SB were similar[12] or lower than others reported in the literature.[11,40] The prevalence of sleep bruxism varies widely in the literature, and is stated to be more prevalent in children (40%), with an average of 8% prevalence during adulthood[30,41], and this is probably the result from different strategies for bruxism diagnosis and classification (e.g. questionnaires, oral history, clinical examination); the characteristics of the study population (e.g. children, adults, general or patient population) and because many studies failed to distinguish between awake-time and sleep-related bruxism[30,33,41]. The prevalence of awake-bruxism also varies in the literature, but it tends to increase with age, ranging from an estimated prevalence of 12% in children to more than 20% in adults[30]. Considering this, it is possible to verify that both values of "possible" SB and AB values found in the present study are within the values stated by the literature. In this context, a few studies have found a positive association between the pre-

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sence of signs and symptoms of TMD and the diagnosis of sleep bruxism and/or awake bruxism (tooth clenching)[7,42], although this finding is not a consensus [43]. Notably, in the present study setting, the diagnoses of SB and AB were determined based on the clinical exam (presence of tooth wear) and medical history, similar to previous studies[4,6,31]. Currently, the gold standard for the evaluation of sleep bruxism and awake clenching is polysomnography and electromyography,[30,33] however, this is still a high-cost technique with limited availability in most Brazilian orofacial pain and TMD public health care services[6].

Nowadays, there is a consensus in the literature that dental occlusion should not be considered a major factor in the TMD etiology. Recent studies have shown a lack of scientific evidence supporting the relationship between occlusal factors and TMD[15,44,45]. Lemos et al.[15] suggested that occlusal factors may play a role as co-factors in predisposing individuals to or perpetuating this disorder but that they should not be considered as primary etiologic agents. Supporting the current literature, the findings of the present study revealed that the majority of patients had a normal lateral and anterior guidance pattern. The prevalence of tooth wear in the study sample was high. However, the diagnoses of sleep bruxism and tooth clenching were only observed in a small number of patients. This enforces the opinion that the prevalence of SB and AB should not rely only on the presence of tooth wear, since they may be the result of a previous activity and may overestimate the actual prevalence[12]. Tooth wear may could also be related to many other factors that can induce attrition and erosion on dental surfaces, like ageing, loss of posterior teeth, occlusal conditions, diet, medications or alimentary disorders[30].

Regarding the sleep position pattern, most patients reported sleeping preferably in the lateral decubitus and prone position. In the literature, few studies investigated the sleep position in patients with TMD[14,46], but the results of this studies suggest that sleeping in the lateral decubitus position may be a contributing factor to TMJ anterior disc displacement, suggesting that due to gravity, the mandibular position may change, leading to the deviation of the ipsilateral condyle posterolaterally and the contralateral one anteromedially[14]. The prone position was also associated with the development of TMJ dysfunction, in patients with unilateral obstructive nasal septal deviation[46], which suggests that these habitual postures during sleep may act as a predisposing factor of TMD[1,46]. Further studies are needed to elucidate this relationship.

The clinical evaluation of TMD revealed a high frequency of patients with articular sound, with clicking being the most prevalent. The incidence of tenderness on TMJ palpation was also high, and most patients reported pain in both TMJs. These results support previous studies that demonstrated a similar prevalence pattern of joint signs in individuals with TMD[2,4,8,35,37]. In contrast, the high number of subjects with tenderness in both TMJs agrees with the high number of patients with severe TMD and a need for treatment observed in our study, indicating that joint pain may be associated with a greater severity of TMD and an increased demand for treatment[18,19].

Corroborating previous studies, the incidence of tenderness on muscle palpation was high[2,37], with the masseter, lateral pterygoid,

sternocleidomastoid, and temporal muscles being the most affected muscles. The literature has shown greater involvement of the mandible elevator muscles in TMDs, especially the masseter and temporal muscles[1,7,47]. The involvement of these muscles may be associated with muscle hyperactivity, ischemia, sympathetic reflexes, and fusimotor reflexes, which alter the blood supply, muscle tone, and emotional and psychological status in patients with TMD[1].

The high involvement of the lateral pterygoid muscle in the present study may be associated with its function, as it is the only muscle that is directly attached to the TMJ. The upper and lower heads of the lateral pterygoid insert into the articular disc and condyle, respectively, and are responsible for the movements of protrusion, laterality, and mouth opening[1,48]. Thus, it has been suggested that the uncoordinated activity of this muscle or hyperactivity of its upper heads may lead to intra-articular disorders, such as disc displacements[48,49].

The sternocleidomastoid muscle is one of the main muscles involved in the support of the skull and cervical region, and it could be affected in the presence of abnormal stomatognathic function in patients with TMD[50]. Studies that investigate the activity of the sternocleidomastoid in patients with TMD are necessary to improve the understanding of its participation in this disorder.

The data related to the diagnosis of TMD are in agreement with previous studies conducted in populations of patients, which demonstrated a higher prevalence of masticatory muscle disorders, followed by disc displacements with and without reduction and TMJ degenerative disease (osteoarthritis/osteoarthrosis)[17,51]. However, studies in non-patient populations have demonstrated a higher prevalence of joint disorders compared to muscular alterations[4,6,17,52]. Regarding treatments, we observed a greater prevalence of reversible therapies, including patient education, self-management, use of medications, interocclusal splints, postural training, physical therapies, and behavioral intervention. These findings are consistent with the current literature, which recommends the use of conservative practices for the treatment of TMDs[1,21,22].

Concerning referrals to TMD-related areas, we found only a small frequency of referrals, with physical therapy and speech therapy being the most common. These data are not in agreement with the literature, which suggests a multidisciplinary and integrative approach in the treatment of TMDs[1,2,15,21,22]. These results can be explained by the fact that the study setting is part of an academic division and is not located in the outpatient clinic of the university hospital, which centralizes most of the specialized medical care.

The data also showed a high frequency of referrals to other dentistry specialties, especially prosthodontics and restorative dentistry. As our study setting provides on-demand service with no screening, it receives patients with problems that are not directly related to TMD, thus explaining the large number of referrals to those specialties.

CONCLUSION

According to the results obtained and considering the limitations of the present study, it was possible to conclude that the greatest demand for treatment in the study came from women, indivi-

duals in the age range of 20 to 29 years, students, single individuals, and individuals with pain complaints. The prevalence of severe symptoms of TMD was high according to the anamnestic index, and the clinical and diagnostic imaging evaluations revealed muscular disorders as the most prevalent findings. The vast majority of therapies were conservative and reversible, and the frequency of referrals to other TMD-related specialties was low.

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