Original articles

Prevalence of kinesiophobia and catastrophizing in patients with temporomandibular disorders

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ABSTRACT

Purpose: to identify the frequency and levels of kinesiophobia and catastrophizing in patients with temporomandibular disorders who had been submitted to speech-language-hearing therapy.

Methods: the sample comprised patients with myogenous (predominantly) and mixed temporomandibular disorders in the study group and healthy individuals in the control group. The instruments used were the Diagnostic Criteria for Temporomandibular Disorders, Tampa Scale for Kinesiophobia, and Pain Catastrophizing Scale. Statistical analyses were performed with the Mann-Whitney test (to compare the means on each scale between the groups) and the Spearman's correlation coefficient test (to analyze the correlation between the scales in each group and its significance).

Results: the study group had a higher pain catastrophizing index than the control group. Likewise, the study group had greater kinesiophobia positive indices, whereas the control group had lower ones. A moderate positive correlation was also identified between kinesiophobia and catastrophizing in the study group.

Conclusion: patients presented with temporomandibular disorders have higher levels of kinesiophobia and catastrophizing than subjects not diagnosed with the disorder.

Keywords: Temporomandibular Joint Dysfunction Syndrome; Catastrophization; Facial Pain

INTRODUCTION

Temporomandibular disorder (TMD) is one of the orofacial pains that affect a considerable portion of the population. It has a high prevalence, as about 20% to 70% of the population has some of its signs or symptoms[1,2]. These include temporomandibular joint (TMJ) pain (triggered by speech or mastication), limited mouth opening, and TMJ noises[2-4]. These factors occur in all classifications (arthrogenous, myogenous, or mixed)[5,6].

TMD musculoskeletal pain can progress into chronicity, defined by the International Association for the Study of Pain (IASP) as continuous or recurrent for more than 3 months[7]. The experience of living with frequent pain has the potential to trigger complex changes in patients, such as emotional, psychosocial, and sensory changes, also affecting their central pain maintenance mechanisms with increased nociceptive pathway circuit and neuronal activity[8], triggering and/or perpetuating these conditions.

Thus, cognitive, behavioral, and psychosocial factors modulate such pain, causing incapacity[9]. Moreover, they may develop kinesiophobia, which is the excessive fear of movements to avoid pain[10]. This behavior is often observed in TMD patients, as the pain caused by these functions is one of its main characteristics. This condition sometimes limits the use of joint biomechanics, restricting the mandibular excursion even when pain is not present, possibly impairing its functioning[11,12].

Another behavior commonly found in chronic TMD patients is catastrophizing, which is "a set of exaggerated negative thoughts during actual or antici-pated painful experiences"[13]. It leads patients to have pessimistic expectations about TMD, increasing their suffering, and possibly limiting their mandibular activity. Thus, researchers seek to understand the psychosocial profile of patients with some type of TMD. Recent studies report that patients with TMJ pain have higher catastrophizing and kinesiophobia levels than painless people[14]. They also have psychosocial suffering and more complex TMD due to the high degree of the abovementioned disorders[15]. Furthermore, all psycho-logical suffering that results from this situation can hinder pain management[16].

Such a scenario is a reality that must be studied by the professionals involved in TMD treatment, such as dentists, speech-language-hearing therapists, psychol-ogists, and so forth. It is paramount to understand the processes that trigger and perpetuate the condition to plan how to address TMD causes and consequences. The fear of pain and its increase can hinder TMD treatment and control because they require mandibular movements and muscle handling within comfortable limits in myofunctional exercises, besides impacting the patient's psychosocial aspects.

Hence, this research aimed to identify the frequency and levels of kinesiophobia and catastrophizing in TMD patients who had been previously submitted to speech-language-hearing therapy. The findings will help develop effective treatment strategies in speech-language-hearing clinical practice, minimizing the damages and attenuating the causes of the disorders.

METHODS

This cross-sectional, observational, descriptive, quantitative study was approved by the Ethics Committee of the Department of Health Sciences at the *Universidade Federal da Paraíba*, Brazil, under number 3.349.187, ensuring participants all their rights.

The experimental population of the study comprised individuals of both sexes treated for 2 years at the Speech-Language-Hearing Service of the Outpatient Center for Buccomaxillofacial Surgery and Traumatology in a University Hospital. The sample was diagnosed with myogenous or mixed TMD. All participants had been previously submitted to speech-language-hearing therapy in the said service to help control the pain and reestablish and manage the orofacial dysfunctional condition. They were discharged from the treatment when the objectives had been reached and the pain had been controlled.

The inclusion criteria were as follows: patients of both sexes with either myogenous or mixed TMD, diagnosed with the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) at least 6 months before the research. The exclusion criteria were the following: patients with craniofacial syndromes, cognitive deficits, or orofacial tumors; submitted to TMJ surgery; with neuromuscular diseases, such as Parkinson's disease, amyotrophic lateral sclerosis, fibromyalgia, or degen-erative joint disease.

The control group (CG) sample was selected by convenience, comprising healthy individuals not diagnosed with TMD, matched for age. Since the research was conducted during the COVID-19 pandemic, data had to be collected remotely, which took place between May and July 2021.

The study group (SG) was selected with the American Academy of Orofacial Pain (AAOP) screening,

administered via phone calls. It has 10 objective yes/no questions on prevailing TMD signs and symptoms and one subjective question on the use of orthodontic appliances. Hence, the study included patients with signs and symptoms suggestive of TMD, who were then informed about the research via phone calls. Afterward, the selected participants signed an informed consent form. Those who agreed to participate in the research filled out the protocols. CG was recruited via social media, especially WhatsApp. Those who volunteered to participate signed an informed consent form and only filled out the protocols.

One of the instruments used to verify the variables was the Tampa Scale for Kinesiophobia for Temporomandibular Disorders (TSK/TMD-Br), which verifies pain intensity. It has 12 items with a Likert scale ranging from 1 to 4, as follows: 1 "strongly disagree"; 2 "disagree"; 3 "agree"; and 4 "strongly agree". The score is determined by summing the items, with a minimum score of 12 and a maximum score of 48[12].

Pain catastrophizing was quantified with the Pain Catastrophizing Scale (B-PCS), which has 13 items that assess pain-related feelings. It uses a 5-point scale, as follows: 0 for minimum, 1 for mild, 2 for moderate, 3 for intense, and 4 for very intense[17]. The score was defined based on the cutoffs: values ≥ 30 high catastrophic pain, 20-29 moderate catastrophic pain, and ≤19 low catastrophic pain[18].

All said protocols were applied via Google Forms, with a link sent via WhatsApp, Facebook, or Instagram. In the case that responses could not be obtained with the form, they were contacted through previously scheduled phone calls. The statistical analysis was performed in SPPS 17 to tabulate data, extract means, modes, and standard deviation, observe the level of correlation between variables with the Spearman correlation test, with the significance level set at $p < 0.05$, and compare the means between groups in each scale with the Mann-Whitney test.

RESULTS

The study comprised 28 volunteers – 14 in SG and 14 in CG –, predominantly females in both groups. The sociodemographic data showed that the mean age in SG was 32.5±16.1 years and in CG, 23.29±5.35 years. The most frequent educational attainment in SG was incomplete higher education, followed by high school graduates. Incomplete higher education prevailed in CG as well (Table 1).

Table 1. Educational attainment in the study group and control group

VARIABLES	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
	SG	SG %	CG	CG %
Incomplete middle school	3	21.4	0	0
Incomplete high school	1	7.1	0	0
High school graduate	4	28.6	2	14.3
Incomplete higher education	5	35.7	11	78.6
Bachelor's degree	1	7.1	1	7.1
Total	14	100	14	100

Captions: SG = study group, CG = control group.

Regarding the persistence of symptoms in SG, 13 (92.9%) of the 14 participants reported difficulties with functions such as masticating, speaking, or using the mandible, 11 (78.6%) of the 14 people noticed TMJ noises, felt their mandibles often stiff, tight, or tired, and felt neckache, toothache, and/or headache. Also, 10 (71.4%) people had difficulties opening their mouths.

Table 2 shows the B-PCS score distribution per category. Most SG participants had a high catastrophizing level. CG, on the other hand, had mostly low levels.

As for TSK/TMD-Br, the SG mean score was 32.57±4.50 points and the CG mean score was 26.50±7.34 points.

Table 2. Tabulation of Catastrophizing Scale data of the study group and control group

CATASTROPHIZING LEVEL	SG	GC	TOTAL
Low	4 (28.6%)	9 (64.3%)	13 (46.4%)
Intermediate	4 (28.6%)	2 (14.3%)	6 (21.4%)
High	6 (42.9%)	3 (21.4%)	9 (32.1%)
Total	14 (100%)	14 (100%)	28 (100%)

Captions: SG = study group, CG = control group.

Table 3 compares the mean B-PCS scores between SG and CG, without categorizing them as low, intermediate, or high. There was a statistically significant difference between SG and CG, indicating an increase in SG.

Table 3. Comparison of means in the Pain Catastrophizing Scale (B-PCS) between the groups with the Mann-Whitney test

GROUP	MEAN	SD	MINIMUM	MAXIMUM
GE	25.6	15.0	0	52
GC	15.1	13.7	0	36
Mann-Whitney U test				
MEAN	SD	MINIMUM	MAXIMUM	P-VALUE
20.4	15.1	0	52	0.022*

Captions: SG = study group, CG = control group, SD = standard deviation.
The statistical significance was set at p < 0.05.

Table 4 shows a significant difference in kinesiophobia scores between SG and CG, demonstrating a higher index in SG.

Table 4. Comparison of means on the Tampa Scale for Kinesiophobia (TSK/TMD-Br) between the groups with the Mann-Whitney test

GROUP	MEAN	SD	MINIMUM	MAXIMUM
SG	32.6	4.5	25	41
CG	26.5	7.3	12	36
Mann-Whitney U test				
MEAN	SD	MINIMUM	MAXIMUM	P-VALUE
29.5	6.7	12	41	0.002*

Captions: SG = study group, CG = control group, SD = standard deviation.
The statistical significance was set at p < 0.05.

The Spearman's correlation test was used to verify the correlation between kinesiophobia and catastrophizing in SG and CG. It indicated a moderate positive correlation only in SG, concluding that as the level of kinesiophobia increases, so does the level of catastrophizing in this group (Table 5).

Table 5. Spearman's correlation coefficient of the study and control groups comparing scores in the Tampa Scale for Kinesiophobia (TSK/TMD-Br) and Pain Catastrophizing Scale (B-PCS)

GROUP	TSK – GE	PCS – GE	TSK – GC	PCS - GC
c	0.661	0.661	0.381	0.381
p-value	0.010*	0.010*	0.179	0.179

Captions: c = Spearman's correlation; SG = study group, CG = control group, p-value = significant at p ≤ 0.05; * = significant p-value.

DISCUSSION

Epidemiological studies involving TMD point out that this disorder affects mainly young adult females, who report symptoms of muscle pain[6,19,20] and headaches[21], which corresponds to the population profile in this research[11,15,22]. The volunteers' educational level helped them quickly and effectively understand the scales, contributing to having the research conducted remotely.

The screening used to identify painful conditions in volunteers during data collection showed that 10 (71.4%) of the 14 SG participants reported pain in or around the ears and in the temporal and masseter regions, which persisted for more than 3 months after the last follow-up visit and characterized a chronic pain[7]; seven of them reported having constant headaches. This chronicity may lead to undesired behaviors, catastrophizing, and kinesiophobia, affecting mandibular functioning. The chronic aspect may have been initially observed in the outpatient treatment with the pain intensity index, which is used to assess therapeutic progress; the screening verified that they continued after the follow-up had finished. Higher scores in this index and myofascial pain (which was diagnosed in most participants in this paper) in the initial stages are predictors of chronification[23].

The high catastrophizing index in SG showed enhanced negative thinking. Pain associated with TMD is known to cause fear and repulsion when one thinks of painful muscle stimuli, which can be associated with the fear of movements. Such associated psychological factors can sometimes increase central sensitivity to pain and enhance body symptoms, possibly causing the disorder to persist due to accumulated disruption of various systems[24]. In this regard, the context in which this research was conducted (the COVID-19 pandemic) stands out, as well as its negative outcomes, which reached the population through the media. These events may have helped enhance catastrophic thoughts related to any existing health issue, including TMD.

The SG in this sample did not reach the 48-point maximum level of kinesiophobia. However, the mean was 32 points, which shows that it directly or indirectly interferes with the patient's routine and confirms that the functioning of the mandibular complex is limited. It is believed that those who scored below the mean only noticed the signs of kinesiophobia after being asked the questions on the scale. The TSK/TMD-Br questions helped understand the somatization and movement restriction due to lesion or pain, which must be observed in individual assessments.

Restricted mandibular movements when performing orofacial functions (especially mastication and speech) can influence speech-language-hearing therapy results and thus damage the prognosis. This treatment is known to require movements and handling in related structures and increased mastication muscle extensibility and joint lubrication. Therefore, it is difficult to ease the tension and make the maneuvers for posture, mandibular mobility, and functional training as needed – which makes clinical management more complex in patients with such sensitivity to pain[15].

The reason why SG volunteers had low or intermediate catastrophizing scores and decreasing kinesiophobia scores is believed to be the instructions they had previously received on how to control crises, such as making massages and hot compressions on the spot, avoiding tough foods, and controlling the levels of stress. They may have also adapted to the pain, improving biopsychosocial aspects related to TMD[25].

The high scores on scales obtained by CG participants may have been due to their previous knowledge of the disorder and its consequences, which indicate the presence of the disorder and the need to see a specialist.

TMD assessment and diagnosis currently involve biological and psychosocial aspects[3,16], broadening the professional's scope regarding the analysis of somatic changes. Hence, in addition to the clinical measures, psychosocial measures can also be used to predict the development of persistent TMD[26] and better manage the pain, preventing it from growing and leading to psychological suffering[16].

The limitations of the study are due to its small sample, probably because of the remote procedure, as it was not possible to communicate with all patients treated at the service. The pandemic may have influenced responses, especially regarding catastrophizing pain.

It is highly important for speech-language-hearing therapists and other specialties involved in TMD treatment to acquire information on the patient's mandibular functioning and their fear of using it in order to conduct the treatment. During therapy, professionals handle these structures in the clinic, which patients must continue at home. This requires good adaptation and adherence to the treatment, which may be impaired due to the high levels of catastrophizing and kinesiophobia.

CONCLUSION

TMD patients had higher levels of kinesiophobia and catastrophizing than people without the diagnosis. Thus, they magnify their fear of movements due to pain and negatively anticipate future episodes, even having been previously submitted to speech-language-hearing therapy.

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