BrJP
Brazilian Journal of Pain

ORIGINAL ARTICLE

Relationship between mindfulness levels and temporomandibular disorder symptoms in university students

Relação entre os níveis de atenção plena e sintomas de disfunção temporomandibular em estudantes universitários

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Submitted on:
December 12, 2025.
Accepted for publication on:
May 27, 2026.
Conflict of interests:
none.
Sponsoring sources:
none.
Ethics statement:
CAAE number 80071624.7.0000.0122.
Data availability
The data that support the findings of this study are available from the corresponding author upon reasonable request.
The study was carried out at Maurício de Nassau University Center - UNINASSAU, Maceió, AL, Brasil.

Associate editor in charge:
Tiago Medina Brazoloto

Editor in charge:
Juliana Barcellos de Souza

ABSTRACT

BACKGROUND AND OBJECTIVES: Temporomandibular disorders (TMD) have a multifactorial etiology, including emotional factors. In this context, dispositional mindfulness may influence the perception of symptoms, especially pain-related symptoms. Therefore, this study aimed to evaluate the relationship between dispositional mindfulness levels and the severity of TMD symptoms in university students.

METHODS: Electronic questionnaires were administered to 360 students enrolled in 19 undergraduate programs at a university center in the northeastern Brazil. The Fonseca Anamnestic Index (FAI) was used to assess TMD symptoms, and the Five Facets of Mindfulness Questionnaire (FFMQ-SF-BR) was used to evaluate dispositional mindfulness. Differences between groups were analyzed using the Kruskal-Wallis, Mann-Whitney and Spearman correlation tests.

RESULTS: Individuals without TMD symptoms or with mild symptoms showed significantly higher total mindfulness scores compared to those with moderate or severe symptoms. Total mindfulness scores and the "describing", "acting with awareness", and "not judging" facets were significantly higher among individuals without treatment need. A negative correlation (-0.225) was observed between total mindfulness levels and total FAI scores.

CONCLUSION: A negative correlation was found between mindfulness and TMD symptoms, suggesting that dispositional mindfulness and its facets may influence the perception and intensity of TMD symptoms in university students.

KEYWORDS: Anxiety, Mindfulness, Psychological stress, Students, Temporomandibular joint disorders.

RESUMO

JUSTIFICATIVA E OBJETIVOS: As disfunções temporomandibulares (DTM) apresentam etiologia multifatorial, incluindo fatores emocionais. Nesse contexto, os níveis de atenção plena (mindfulness disposicional) podem influenciar a percepção dos sintomas, especialmente aqueles relacionados à dor. Assim, o objetivo deste estudo foi avaliar a relação entre os níveis de atenção plena e a gravidade dos sintomas de DTM em estudantes universitários.

MÉTODOS: Questionários eletrônicos foram aplicados a 360 estudantes de 19 cursos de graduação de um centro universitário do Nordeste brasileiro. O Índice Anamnésico de Fonseca (IAF) foi utilizado para identificar os sintomas de DTM, e o *Five Facets Mindfulness Questionnaire - Short Form* (FFMQ-SF-BR), para avaliar os níveis de atenção plena. As diferenças entre os grupos foram analisadas por meio dos testes de Kruskal-Wallis, Mann-Whitney e correlação de Spearman.

RESULTADOS: Indivíduos sem sintomas de DTM ou com sintomas leves apresentaram escores estatisticamente mais elevados de atenção plena total quando comparados àqueles com sintomas moderados ou graves. Os escores de atenção plena total e das facetas "descrever", "agir com consciência" e "não julgar" foram significativamente mais elevados em indivíduos sem necessidade de tratamento. Observou-se correlação negativa (-0,225) entre os níveis de atenção plena total e o escore total do IAF.

CONCLUSÃO: Foi demonstrada uma correlação negativa entre atenção plena e sintomas de DTM, sugerindo que a atenção plena disposicional e suas facetas podem influenciar a percepção e a intensidade dos sintomas de DTM em estudantes universitários.

DESCRITORES: Ansiedade, Atenção plena, Estresse psicológico, Estudantes, Transtornos da articulação temporomandibular.

HIGHLIGHTS

- Higher dispositional mindfulness was associated with lower severity of TMD symptoms in university students
- Mindfulness facets such as acting with awareness, describing, and non-judging were related to lower treatment need for TMD
- Dispositional mindfulness may influence pain perception and emotional aspects associated with temporomandibular disorders

INTRODUCTION

Temporomandibular disorders (TMD) comprise a group of conditions that may cause a variety of signs and symptoms, such as orofacial pain and musculoskeletal dysfunction[1]. It is estimated that 34% of the global population is affected by this disorder, with the highest prevalence observed in South America (47%), among individuals aged 18 to 60 years (41%), and in females[2].

TMD has a multifactorial etiology, with sleep disorders, parafunctional habits, psychological factors, and anatomical factors being particularly relevant[3-5]. The influence of psychological factors on the etiology of TMD and on bruxism behavior has long been recognized[6,7] Currently, the biopsychosocial model incorporates these factors, along with social aspects, to explain the development and progression of TMD and bruxism. Accordingly, anxiety, depression, perceived stress, affective distress, and catastrophizing have been consistently associated with this disorder and/or bruxism[3,7-9].

Furthermore, recent studies have shown that psychosocial distress resulting from the COVID-19 pandemic lockdown increased the frequency of TMD symptoms and bruxism behaviors, particularly during wakefulness[10,11]. This triad interacts reciprocally with the individual's psychological and emotional state[11].

In line with the biopsychosocial model, dispositional mindfulness refers to a personality trait or psychological state characterized by the ability to maintain conscious and non-reactive attention to the present moment[12]. It also represents a potential regulatory factor in the emotional mechanisms of pain[13,14].

Evidence suggests that higher levels of dispositional mindfulness are associated with lower pain intensity[12-15], reduced perception of pain-related discomfort[12], and lower pain catastrophizing[13,15]. In addition, higher dispositional mindfulness has been associated with greater deactivation of a brain regions extending from the precuneus to the posterior cingulate cortex, which are involved in sensory, cognitive, and affective processing[12].

Dispositional mindfulness can be assessed using instruments such as the Mindful Attention Awareness Scale (MAAS), Kentucky Inventory of Mindfulness Skills (KIMS), Five Facets Mindfulness Questionnaire (FFMQ) and the Philadelphia Mindfulness Scale (PHLMS)[16,17]. The FFMQ is currently the most widely used instrument[17] and is a multidimensional tool composed of five facets, also known as the five factors of mindfulness, which represent fundamental elements of an individual's general disposition[17-19]. These facets were identified in previous studies[19-22] and defined as follows: 1) observing, which refers to noticing internal and external experiences; 2) describing, which involves labeling the characteristics of internal experiences; 3) acting which awareness, which refers to being attentive to present-moment activities; 4) non-judging internal of inner experience, defined as adopting a non-evaluative stance toward thoughts and feelings; and; 5) non-reactivity to inner experience, which involves allowing thoughts and feelings to arise and pass without reacting to them.

Considering that pain is one of the most prevalent symptoms in patients with TMD[23,24], investigating the relationship between this disorder and dispositional mindfulness is of considerable clinical relevance. Previous studies have demonstrated that higher levels of dispositional mindfulness, as assessed by the FFMQ, are associated with lower pain intensity and reduced pain catastrophizing related to TMD[15]. However, the relationship between dispositional mindfulness and facets and TMD symptoms remains unclear.

Thus, the objective of this study was to investigate the possible relationship between dispositional mindfulness levels and the prevalence of TMD symptoms in university students, as well as to assess whether differences exist according to gender and area of study (health sciences, humanities, and exact sciences).

METHODS

A cross-sectional observational study was conducted using an electronic questionnaire for data collection.

The study was approved by the Research Ethics Committee of the Mauricio de Nassau University Center (UNINASSAU MACEIÓ) under CAAE number 80071624.7.0000.0122.

Universe and sampling

The study sample consisted of undergraduate students from different courses at a university center in northeast Brazil who were duly enrolled during the second semester of 2024. Individuals aged over 18 years, of both genders, who agreed to participate by signing the Free and Informed Consent Term, were included in the study sample.

To determine the sample size (n), a population frequency calculation was performed using the open-source calculator available on the statistical website OpenEpi.com, version 3. Considering a population of 5,527 enrolled students, a standard error of 5%, a significance level of 5%, a hypothetical sample frequency of 50%, and a 95% confidence interval, the estimated sample size was 360 participants.

Data collection and instruments

Data were collected using an electronic questionnaire developed through Google Forms®, consisting of sociodemographic questions, such as age, gender, marital status, undergraduate course, and academic semester, in addition to questions from the Fonseca Anamnestic Index (FAI) and the Five Facets of Mindfulness Questionnaire (FFMQ-SF-BR).

The FAI is a screening instrument used to assess TMD symptoms, and has been translated and validated in different countries[25–27]. It consists of 10 questions with response options ranging from "yes", "no", and "sometimes", scored as 10, 0, and 5 points, respectively. The total score allows classification of TMD symptom severity as absent, mild, moderate or severe, as well as classification of treatment need as absent (absence or mild symptoms) or present (moderate or severe symptoms)[28].

The reduced and validated Portuguese version of the FFMQ-SF-BR, composed of 24 items encompassing five mindfulness facets (observing, describing, acting with awareness, non-judging of inner experience and non-reactivity to inner experience), was used. Participants' responses were assessed using a Likert scale ranging from 1 ("never or rarely true") to 5 ("always or almost always true")[18,29,30].

Data analysis

The collected data was tabulated in Excel spreadsheets and analyzed using descriptive and inferential statistics, with results presented in graphs and tables. Statistical analyses were performed using SPSS software, version 20.0. Normality was assessed using the Kolmogorov-Smirnov test, which demonstrated nonparametric distribution of the data; therefore, nonparametric statistical tests were applied, adopting a significance level of 5% ($p<0.05$) for all analyses. Possible differences in median values according to gender and TMD treatment need were evaluated using the Mann-Whitney U test, whereas differences related to marital status, area of study and TMD severity were assessed using the Kruskal-Wallis test, followed by pairwise comparisons.

Correlation between FAI and FFMQ-SF-BR scores (including each mindfulness facet) were analyzed using Spearman's correlation test, adopting Cohen's criteria as follows:

- $r_s = |\pm 0.10| \rightarrow$ weak correlation;
- $r_s = |\pm 0.30| \rightarrow$ moderate correlation;
- $r_s = |\pm 0.50| \rightarrow$ strong correlation;

RESULTS

A total of 360 students, with a mean age of 23.8 years (±6.39), agreed to participate in this study. Among these, 235 (65.3%) were female and 125 (34.7%) were male. Regarding marital status most participants were single (n=273; 75.8%), followed by married individuals (n=57; 15.8%). Students were divided into three academic areas: 191 (53.1%) from the healthcare area, 114 (31.7%) from the humanities area, and 55 (15.3%) from the exact sciences area (Table 1).

The distribution of participants according to undergraduate courses, as well as the median total dispositional mindfulness scores for each course, are presented in Table 1. The average total mindfulness score of the sample was 75.49 (±9.64), and the values for each mindfulness facet are presented in Figure 1.

It was observed that 78 students (21.7%) did not present TMD symptoms, 188 (52.2%) presented mild TMD symptoms, 68 (18.9%) moderate, and 26 (7.2%) severe symptoms. In addition, 266 (73.9%) students did not require treatment, whereas 94 (26.1%) required treatment.

There was a statistically significant difference in dispositional mindfulness scores according to gender only for the "non-reactivity" facet, in which men presented significantly higher median scores than women (p=0.040). No significant differences in mindfulness levels were observed according to area of study or marital status (Table 2).

Table 3 presents the distribution of total dispositional mindfulness scores according to TMD symptom severity of TMD and treatment need, both determined by the FAI based exclusively on self-reported symptoms. Students without TMD symptoms presented significantly higher scores compared to those with moderate and severe TMD symptoms (p=0.003) (pairwise comparisons are presented in Supplemental Material 1); as well as compared to students requiring treatment (p=0.002).

When dispositional mindfulness levels were analyzed according to each facet (Table 3), a statistically significant difference related to TMD symptom severity was observed only

Table 1. Number of students per undergraduate course (n), median total mindfulness scores, and interquartile range (IQR) for each course.

Undergraduate Courses		n	Median Total Mindfulness Scores	IQR
Healthcare	Dentistry	35	78	14
	Nursing	30	74	10
	Veterinary Medicine	18	75.5	10
	Speech Therapy	18	75.5	9
	Nutrition	18	75.5	10
	Biomedicine	18	72	12
	Physiotherapy	18	71	19
	Pharmacy	18	74.5	9
	Aesthetics and Cosmetics	18	77	17
Humanities	Psychology	18	74.5	13
	Law	18	75.5	11
	Business Administration	18	75.5	13
	Gastronomy	18	77.5	12
	Accounting Sciences	18	72	6
	Architecture and Urbanism	17	77	11
	Pedagogy	7	82	8
Exact Sciences	Mechanical Engineering	19	79	18
	Civil Engineering	18	79	12
	Computer Science	18	70	16

Table 2. Comparison of total mindfulness scores and its facets according to gender, area of study, and marital status.

	Gender				p-value[a]
	Female		Male		
	Median	IQR	Median	IQR	
Total Mindfulness	75	12	76	11	0.085
Observing	14	6	13	6	0.052
Describing	16	5	17	5	0.052
Acting with awareness	17	7	18	7	0.355
Non-judging	14	6	14	7	0.324
Non-reactivity	14	5	15	5	0.040*
	Areas of Study				
	Healthcare		Exact		Humanities		p-value[b]
	Median	IQR	Median	IQR	Median	IQR	
Total Mindfulness	75	11	76	15	76	11	0.502
Observing	14	5	13	7	14	5	0.986
Describing	17	5	17	6	17	5	0.504
Acting with awareness	18	8	17	8	18	6	0.758
Non-judging	14	5	15	6	14	7	0.773
Non-reactivity	14	6	15	5	15	5	0.064
	Marital Status				
	Single		Married		Other		p-value[b]
	Median	IQR	Median	IQR	Median	IQR	
Total Mindfulness	75	11	75	14	75.5	10	0.616
Observing	14	5	13	7	14.5	6	0.438
Describing	17	5	17	5	17	5	0.587
Acting with awareness	18	7	19	8	16.5	6	0.232
Non-judging	14	6	14	5	14	6	0.673
Non-reactivity	14	5					0.146

IQR= Interquartile range. ([a]) = Mann-Whitney U test. ([b]) = Kruskal-Wallis test. (*) = Statistically significant difference (p<0,05).

Table 3. Comparison of total dispositional mindfulness levels and its facets according to temporomandibular disorder severity and treatment need.

	Without TMD		Mild		Moderate		Severe		p-value[a]
	Mdn	IQR	Mdn	IQR	Mdn	IQR	Mdn	IQR	
Total Mindfulness	78	11	75	10	72	14	72.5	12	0.003*
Observing	13	5	13	6	14	5	14.5	7	0.085
Describing	17	5	17	6	16	6	16	6	0.067
Acting with awareness	19	7	18	7	15	6	14	5	0.051
Non-judging	14	7	15	6	13	7	14	5	0.009*
Non-reactivity	15	5	14	6	14	6	13.5	6	0.288
	Without treatment need				**With treatment need**				p-value[b]
	Mdn		IQR		Mdn		IQR		
Total Mindfulness	76		10		72		13		0.002*
Observing	13		6		14		6		0.012*
Describing	17		4		16		6		0,033*
Acting with awareness	18		7		16		9		0.017*
Non-judging	14		6		13.5		7		0.002*
Non-reactivity	14		5		14		6		0.255

Mdn = Median. IQR = Interquartile range. (a) Kruskal-Wallis test. (b) Mann-Whitney U test. (*) = Statistically significant difference (p<0,05).

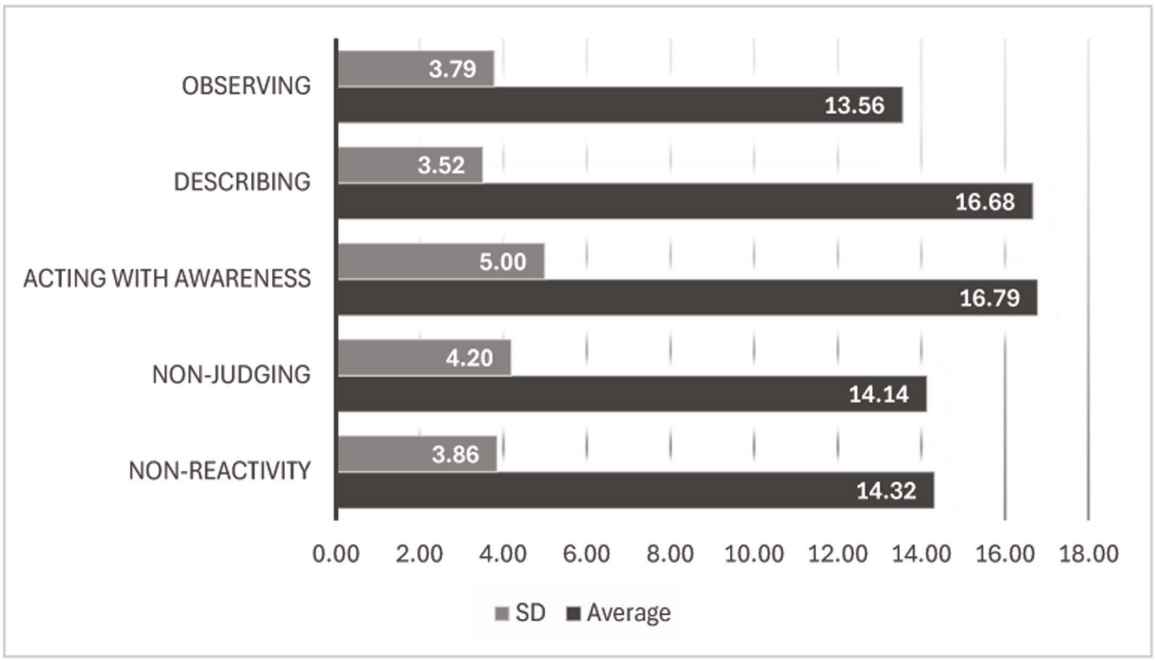

Figure 1. Standard deviation and average mindfulness scores of the sample for each facet.

Table 4. Correlation between FAI total scores and the level of total dispositional mindfulness levels and its facets.

	Total FAI	
	rho	p-value
Total Mindfulness	-0.225	<0.0001
Observing	0.132	0.012
Describing	-0.154	0.003
Acting with awareness	-0.182	0.001
Non-judging	-0.160	0.002
Non-reactivity	-0.123	0.018

Spearman's Correlation Test.

for the "non-judging" facet (p=0.009). Pairwise comparisons (Supplemental Material 1) demonstrated that students with mild TMD symptoms presented significantly higher scores compared to those with moderate TMD symptoms. Students without treatment presented significantly higher scores for the "describing", "acting with awareness", and "non-judging" facets compared to individuals requiring treatment. However, they presented significantly lower scores for the "observing" facet compared to students requiring treatment.

As shown in Table 4, a statistically significant weak negative correlation was observed between total dispositional mindfulness scores and total FAI scores. In other words, lower levels of dispositional mindfulness were correlated with greater severity of TMD symptoms assessed by the FAI. The same pattern was observed for all mindfulness facets, except "observing" facet, which showed a weak positive correlation. Thus, higher levels of dispositional mindfulness in the 'observing' facet were correlated with greater severity of TMD symptoms.

DISCUSSION

This study is unprecedented in investigating the relationship between levels of dispositional mindfulness and TMD symptoms in university students, who represent a population with a high prevalence of this disorder due to academic demands, psychological burden, and poor sleep quality[31,32].

Dispositional mindfulness refers to a personality trait characterized by the ability to maintain awareness and attention to the present moment[12], as well as to recognize and disengage from internal conflicts[33], potentially influencing pain-related mechanisms[13,14]. It therefore differs from mindfulness as an intervention, which consists of a set of practices and protocols, such as meditation, mindfulness-based cognitive therapy, dialectical behavior therapy, acceptance and commitment therapy, and other interventions designed to develop this dispositional trait and its potential benefits[34,35].

The sample of this study consisted of 360 students, most of whom were female, single, and enrolled in healthcare courses. The average total mindfulness score was 75.49±9.64. Furthermore, male students significantly higher scores for the "non-reactivity" facet. No statistically significant differences were observed according to marital status and area of study. These findings corroborate previous studies[36,37] that also identified gender differences in specific mindfulness skills, possibly related to sociocultural factors that influencing emotional regulation and response to adverse stimuli.

The results showed that 78.3% of students presented TMD symptoms, with the majority exhibiting mild symptoms (52.2%). This finding is supported by previous studies that associate TMD with factors such as anxiety, stress, depression, and the high academic demands frequently experienced by this population[7,11,38-40]. Furthermore, corroborating the literature[41–43], most students with moderate and severe TMD symptoms were female, regardless

of marital status or academic semester. Hormonal factors and the female biopsychosocial profile may contribute to greater vulnerability to stress and anxiety, both of which are associated with the development and intensification of TMD symptoms. Additionally, women often balance multiple academic, professional, and personal responsibilities, resulting in overload that may directly affect their physical and mental health, partially explaining the higher prevalence of TMD observed in this group[44-46]. This scenario becomes even more relevant considering the increasing participation of women in higher education, a trend reflecting important social advances[47].

Initially, TMD predominantly attributed to occlusal factors; however, more recent studies have demonstrated that TMD is a multifactorial condition influenced by emotional, hormonal, muscular, joint, and traumatic factors, among others[3,48]. Due to its etiological complexity, inadequate treatment performed by non-specialized professionals may aggravate the clinical condition[49]. In this context, understanding the relationship between dispositional mindfulness and TMD symptoms is important, as it may support the incorporation of alternative and non-invasive therapeutic approaches, such as mindfulness-based interventions.

In the present study, students without TMD symptoms exhibited significantly higher total dispositional mindfulness scores compared to those with moderate and severe TMD symptoms. Likewise, students without treatment need, according to the FAI instrument and based exclusively on self-reported symptoms, also exhibited higher total dispositional mindfulness scores compared to students requiring treatment, who presented greater TMD symptom severity.

These findings suggest that more severe TMD symptoms may be associated with reduced dispositional mindfulness[18,22,50]. This relationship may be explained by the fact that mindfulness, as a psychological skill, is closely related to emotional regulation and pain perception[51]. Individuals without TMD symptoms generally exhibit lower central sensitization and reduced emotional reactivity to stressors, contributing to a more balanced pain experience and grater pain regulation. On the other hand, individuals with moderate and severe TMD symptoms often present greater sensitization, which may amplify symptom perception. These individuals tend to experience pain more intensely and have greater difficulty regulation it, which may explain the differences observed among the studied groups[50].

Furthermore, it is possible that individuals classified as having no TMD symptoms represent a profile characterized by greater resilience to stress, better ability to cope with muscle tension, and lower propensity to develop dysfunctional pain-related patterns. In contrast, individuals with moderate and severe groups present not only greater symptom intensity, but also greater etiological complexity, including increased emotional distress and lower self-actualization/existential well-being. On the other hand, the lack of significance differences between students without TMD symptoms and those with mild symptoms suggests that the transition to more severe stages of TMD involves physiological and emotional factors that become more evident at moderate and severe levels, particularly in females, whereas mild symptoms may share characteristics more similar to the absence of clinically relevant symptoms[43].

These findings reinforce the hypothesis that dispositional mindfulness may play an important role in pain modulation, particularly in the early or less severe stages of TMD[50], potentially preventing progression to more intense degrees. Previous studies have indicated that low levels of dispositional mindfulness are associated with physiological processes such as increased muscle tension, inflammation, and central sensitization, which are more pronounced in moderate and severe degrees of TMD[50,52,53].

Psychosocial factors, such as catastrophizing and anxiety, influence the pain experience associated with temporomandibular disorders (TMD)[7-9]. Conversely, higher levels of dispositional mindfulness have been associated with lower occurrence of catastrophic thoughts and reduced emotional reactivity, contributing to pain reduction and improved functional outcomes[15].

Moreover, dispositional mindfulness and self-awareness capacities may also contribute to greater perception and control of parafunctional habits, such as bruxism behaviors, particularly during wakefulness, which may be associated with TMD[54]. To date, no studies evaluating the relationship between mindfulness and bruxism have been identified. However, recent studies have proposed the use of ecological momentary assessment measures through smartphone applications to asses and monitor awake bruxism behavior[54-56]. This strategy has proven useful, as it promotes increased greater awareness, self-recognition, and self-control of bruxism behaviors[10].

When the facets of dispositional mindfulness were analyzed separately, students with mild TMD symptoms exhibited significantly higher scores for the "non-judging" facet compared to students with moderate TMD symptoms. In addition, students without treatment need exhibited significantly higher scores for the "describing", "acting with awareness", and "non-judging" facets. These findings suggest the relevance of specific mindfulness facets in the perception and control of TMD symptoms.

These findings may be explained by the direct relationship between mindfulness and emotional regulation, body awareness, and coping strategies, elements frequently altered in individuals with TMD[5]. The "non-judging" facet, in particular, may positively influence the way individuals deal with pain and discomfort by reducing negative emotional reactions and promoting greater acceptance. Furthermore, a recent study demonstrated that this facet was associated with lower levels of pain catastrophizing in women with painful TMD[15]. The describing facet may be associated with the ability to recognize and articulate sensory and emotional experiences, whereas "acting with awareness" facet may contribute to more deliberate and less automatic behaviors, reducing habits that could exacerbate TMD symptoms[50].

This study demonstrated statistically significant negative correlations between FAI scores and total dispositional mindfulness, as well as the "describing", "acting with awareness", "non judging" and "non-reactivity" facets. These findings indicate that dispositional mindfulness and the aforementioned facets were inversely correlated with TMD symptom severity. Thus, emotional regulation and behaviors related to these facets may contribute to a more balanced perception of pain[15,50].

On the other hand, the "observing" facet presented the only positive correlation with the FAI. This finding may indicate that, in some individuals, greater attention to internal sensations and

bodily experiences is associated with increased perception of TMD symptoms.

Limitations and future research

This study contributed to the understanding of the relationship between dispositional mindfulness and TMD symptoms in university students. However, some limitations should be considered and may provide directions for future research. The absence of clinical examinations limited the accuracy of TMD diagnosis. Although widely accepted as a screening tool, the FAI does not provide a definitive diagnosis, which may have resulted in false-positive or false-negative cases[28]. Furthermore, the FAI allows the classification of participants according to TMD severity and treatment need based exclusively on self-reported symptoms. Due to the absence of clinical assessment, the findings should be interpreted with caution, and future studies including clinical examinations are recommended.

It should also be emphasized that the reporting of symptoms, such as those identified by the FAI, is not equivalent to conditions requiring treatment. Management should be patient-centered and based on an appropriate TMD diagnosis, which involves a standardized and validated medical history, as well as a clinical assessment performed by a trained examiner[1]. This approach reduces the risk of overtreatment, which may lead to negative consequences for patients, such as higher costs, longer treatment duration, greater invasiveness, and potential post-treatment complications[57].

The correlations between dispositional mindfulness scores and its facets with the FAI scores were statistically significant. However, these correlations were weak and should be interpreted with caution. Therefore, further studies with larger samples are warranted.

Furthermore, future research should expand the scope of investigation by including more diverse samples from different educational institutions. It would also be interesting to conduct studies during specific periods of the academic calendar, such as before and after examinations, to investigate possible fluctuations in dispositional mindfulness levels and in the severity of TMD symptoms. In addition, the use of the DC/TMD (Diagnostic Criteria for Temporomandibular Disorders) protocol would allow differentiation of TMD subtypes, such as muscular and articular disorders, providing a more detailed understanding of the interactions between these conditions and mindfulness. These perspectives bring us closer to a broader goal: understanding how dispositional mindfulness may influence the perception and control of TMD, expanding not only scientific knowledge, but also the possibilities for mindfulness-based interventions.

CONCLUSION

A negative correlation was observed between dispositional mindfulness levels and TMD symptoms prevalence, suggesting that dispositional mindfulness and its facets, especially "acting with awareness," and "non-judging", may modulate the perception and intensity of TMD symptoms in university students. These findings open perspectives for future research aimed at further elucidating the role of dispositional mindfulness within the biopsychosocial model of TMD and orofacial pain.

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SUPPLEMENTARY MATERIAL

Supplementary material accompanies this paper.
Supplemental Material 1 - Kruskal-Wallis Test and Pairwise Comparisons
This material is available as part of the online article from https://doi.org/10.63231/2595-0118.202680-en