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Relationship between temporomandibular joint dysfunctions and psychosomatic factors

Relação entre disfunção temporomandibular e fatores psicossomáticos

Relación entre disfunción temporomandibular y factores psicosomáticos

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ABSTRACT

Objective: To evaluate the prevalence of TMD signals and symptoms and psychosomatic factors in dental students of different semesters from public and private institutions located in Fortaleza, CE, Brazil. **Methods:** This is a quantitative, observational and cross-sectional study by convenience, carried out with students enrolled in the first, fifth and tenth semesters. Data were collected using the Fonseca Anamnesia Index (FAI), Depression Stress and Anxiety Scale (DASS 21) and Pittsburgh Sleep Quality Index (PSQI). **Results:** The sample was composed of 114 students, it was observed that most students presented mild signs and symptoms of TMD (48.2%) when compared to moderate (17.5%) and severe (7.9%). Students who reported stress were also more anxious, depressed and had poor sleep quality. **Conclusion:** The population investigated is subject to important risk factors for the development and/or progression of TMJ dysfunction and psychosomatic factors

Keywords: Temporomandibular joint disorder, Anxiety, Sleep disorder, Psychosocial impact.

RESUMO

Objetivo: Avaliar a prevalência de sinais e sintomas de DTM e fatores psicossomáticos em estudantes de Odontologia de diferentes semestres universitários, de instituições públicas e privadas localizadas em Fortaleza, CE, Brasil. **Métodos:** O presente estudo é um estudo quantitativo, observacional e transversal por conveniência, realizado com alunos matriculados no primeiro, quinto e décimo semestre. Os dados foram coletados por meio do Índice Anamnésico de Fonseca (FAI), Escala de Estresse Depressão e Ansiedade (DASS 21) e Índice de Qualidade do Sono de Pittsburgh (PSQI). **Resultados:** A amostra foi composta por 114 alunos, observou-se que a maioria dos alunos apresentou sinais e sintomas leves de DTM (48,2%) quando comparados aos moderados (17,5%) e graves (7,9%). Os alunos que relataram estresse também eram mais ansiosos, depressivos e tinham qualidade de sono ruim. **Conclusão:** A população investigada está

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sujeita a importantes fatores de risco para o desenvolvimento e/ou progressão da disfunção da articulação temporomandibular e de fatores psicossomáticos.

Palavras-chave: Transtornos da articulação temporomandibular, Ansiedade, Distúrbios do sono, Impacto psicossocial.

RESUMEN

Objetivo: Evaluar la prevalencia de signos y síntomas de TTM y factores psicosomáticos en estudiantes de Odontología de diferentes semestres de instituciones universitarias, públicas y privadas localizadas en Fortaleza, CE, Brasil. **Métodos:** Se trata de un estudio cuantitativo, observacional y transversal por conveniencia, realizado con estudiantes matriculados en el primero, quinto y décimo semestres. Los datos fueron recolectados utilizando el Índice de Anamnesis de Fonseca (FAI), La Escala de Depresión Estrés y Ansiedad (DASS 21) y el Índice de Calidad del Sueño de Pittsburgh (PSQI) **Resultados:** La muestra estuvo compuesta por 114 estudiantes, se observó que la mayoría de los estudiantes presentaban signos y síntomas leves de TTM (48,2%) frente a moderados (17,5%) y graves (7,9%). **Conclusión:** La población investigada está sujeta a importantes factores de riesgo para el desarrollo y/o progresión de la disfunción de la articulación temporomandibular y factores psicosomáticos.

Palabras clave: Transtornos de la articulacíon temporomandibular, Ansiedad, Transtorno del sueño, impacto psicosocial.

INTRODUCTION

Temporomandibular joint dysfunctions (TMDs) imply a series of disorders that affect the temporomandibular joint (TMJ) and/or masticatory muscles and associated structures (DE LEEUW R, et al., 2018). These disorders manifest themselves through a set of peculiar signs and symptoms and may include TMJ pain, joint noises such as clicks and crackles, limitation of mandibular movements, as well as masticatory muscles, head and face pain (DE LEEUW R et al., 2018). Pain is the most common symptom and the primary reason why people seek treatment (KOHLI D, THOMAS DC, 2021).

It is the second most common musculoskeletal condition (after chronic low back pain) and the second leading cause of orofacial pain, following odontogenic pain, with an annual incidence of 3.9% (DUBNER R, et al., 2016; VALESAN LF, et al., 2021).

TMJ disorders can progress to states of chronic pain, which are often debilitating and have a negative impact on the affected individuals' lifestyle, resulting in various physical, social, and psychological difficulties (POLONOWITA AD, et al., 2019; SANTOS EA, et al., 2022). Epidemiological data show that 33% of the population reports at least one symptom, and 40% to 75% presents at least one sign of TMD, with a higher prevalence in women aged 20-40 years (CARRARA SV, et al., 2018; ALAMARY AW, 2019).

No Brazil, epidemiological studies by Melo et al. (2019) showed a prevalence of TMD in the population at 33.2%. The most common diagnosis was joint dysfunction (38.9%), followed by disc displacement (30.3%), and myofascial pain (11.5%).

Additionally, studies by Bertoli et al. (2018) in Brazil found a prevalence of TMD symptoms in 34.9% of the studied population. The most frequently reported symptoms were headache and neck pain (20.9%), followed by joint noises (18.5%). Moreover, there was a significant association between gender and TMD symptoms, with prevalence being significantly higher in females.

The etiology of TMD is multifactorial and may present several predisposing factors, like trauma, parafunctional habits, among others (MOTGHARE V, et al., 2015). Authors state that moments of tension and stress coincide with manifestations of pain, suggesting that psychosomatic factors such as anxiety, sleep disorders, stress and depression, for example, may be significant in the process of TMD pathogenesis, both in the development and maintenance of the dysfunction (MOTGHARE V, et al., 2015; BENASSI GF, et al., 2020).

In addition, emotional stress can influence triggering parafunctional habits, which are significant factors in the etiology of TMD (PAULINO MR, et al, 2018). Furthermore, the beneficial role of TMD interventions in improving symptoms of depression and anxiety has been evidenced, suggesting a mutual relationship between TMD and the psychosocial aspects assessed (LUO LY, et al., 2023).

In this context, studies show health professionals are likely to present psychosomatic factors, like anxiety (BENASSI GF, et al., 2020). Therefore, among the health area professions, dental practice presents a significant ergonomic risk due to the posture and movements required during the exercise of the function (BENASSI GF, et al., 2020). Considering TMJ makes muscular and ligamentous connections in the cervical region, this professional category may be susceptible to the development of TMD (BRAZ MA, et al., 2020).

In addition, authors state that dental students may also be susceptible to present psychosomatic alterations and/or TMD, because besides the physiological risks inherent to the function that can favor the development of TMD, there is also the psychological risk that involves the concern with the academic performance (BENASSI GF, et al., 2020; BRAZ MA, et al., 2020; SOUTWELL J, et al., 1990).

Thus, this study aims to evaluate the prevalence of signs and symptoms of TMD and psychosomatic factors in dental students in different college semesters, from public and private institutions located in Fortaleza, CE, Brazil.

METHODS

Study design and sample

This is a quantitative, observational and cross-sectional study for convenience, conducted with students of both sexes, from the first, fifth and tenth semester of the dentistry course at two colleges located in Fortaleza, CE, Brazil.

The research excluded transferred students, individuals unfit to answer the questionnaires applied and people with a previous diagnosis of different causes of pain.

The institutions selected for the present study offer a ten-semester dentistry course and were chosen purposefully to allow a more significant standardization of the data collected in the samples.

Also, the choice of these specific college semesters aimed at greater representativeness, approaching students from the beginning, middle and end of the course.

Data collection and study tools

The study collected data through three questionnaires previously validated in the literature: the Fonseca Anamnestic Index (FAI) (FONSECA DM, et al., 1994), Depression, Anxiety and Stress Scale (DASS-21) (LOVIBOND SH, LOVIBOND PF, 1995) and Pittsburgh Sleep Quality Index (PSQI) (BUYSSE DJ, et al., 1989).

The researchers applied the questionnaires in a single time, according to the students' teaching plan for each semester, so as not to compromise any academic activity.

The Fonseca Anamnestic Index (FAI)

The Fonseca Anamnesic Index (FAI) is an instrument that was developed in Portuguese for the Brazilian population and is widely used in research and clinical practice. Its purpose is to assess the severity of TMD, according to signs and symptoms, containing information about TMJ range of motion and the presence of pain, parafunctional habits, noise, among other aspects.

It consists of ten items with three answer options: "yes" (10 points), "sometimes" (5 points) and "no" (0 points). The final score is determined by the sum of the points from all the items and allows for the following classification: no signs and symptoms of TMD (0 - 15 points), mild TMD (20 - 45 points), moderate TMD (50 - 65 points) and severe TMD (70 - 100 points) (FONSECA, 1992; CHAVES TC, et al., 2008).

Depression, Anxiety and Stress Scale (DASS-21)

The Depression, Anxiety and Stress Scale - Short Form (DASS-21) was constructed by (LOVIBOND SH, LOVIBOND PF, 1995) with the aim of measuring and differentiating anxiety and depression symptoms as much as possible.

It is based on the tripartite model, in which the symptoms of anxiety and depression are grouped into three basic structures: the first, (a) is defined by the presence of negative affect, such as depressed mood, insomnia, discomfort and irritability, which are non-specific symptoms and are included in both depression and anxiety; the second includes (b) factors that constitute structures that represent specific symptoms for depression (anhedonia, absence of positive affect); the last structure concerns the (c) specific symptoms of anxiety (somatic tension and hyperactivity) (WATSON D, 1995).

In the DASS-21, volunteers record the degree to which they experience each of the symptoms described in the items during the last week (previous week), on a 4-point scale between 0 (does not apply to me) and 3 (applies to me a lot, or most of the time). Scores for depression, anxiety and stress are determined by adding up the scores of the 21 items. The factor structure of the DASS-21 is stable and has acceptable convergent and discriminant validity (LOVIBOND SH and LOVIBOND PF, 1995).

Pittsburgh Sleep Quality Index (PSQI)

The PSQI is a simple, easy-to-answer questionnaire that enables a quantitative and qualitative assessment of sleep over the last month (BUYSSE DJ, et al., 1989). It is made up of 10 questions, with subdivisions of up to ten sub-items, from which it will be identified whether the patient is a "good sleeper" or a "bad sleeper". The questions are divided into seven domains, which will be assigned scores between zero and three points, with 0 indicating "very good" quality, 1 "good", 2 "poor" and 3 "very poor" (PASSOS HP, et al., 2017).

The PSQI domains are as follows: 1) Subjective sleep quality (individual perception of sleep quality); 2) Sleep latency (time needed to induce sleep); 3) Sleep duration (how long you stay asleep); 4) Habitual sleep efficiency (ratio between the number of hours slept and the number of hours spent in bed); 5) Sleep disturbances (presence of situations that compromise sleep time); 6) Use of sleep medication and, finally, 7) Daytime sleepiness and disturbances during the day, such as disposition and enthusiasm for carrying out routine activities (BUYSSE DR, et al., 1989). After analyzing the domains, an index (PSQI) will be obtained which can vary from 0 to 21 points, with scores above 5 points indicating a poor sleep pattern.

Ethical aspects

The study was carried out in accordance with Resolution 466/12 of the National Health Council/Ministry of Health and was approved by the Unichristus Ethics Committee (CAAE 30710220.2.1001.5049) under protocol number 4.079.783. Before starting the study, all participants read and signed the Informed Consent Form (ICF).

Statistical analysis

The data obtained in each questionnaire were tabulated in a spreadsheet (Microsoft Excel software) and grouped according to each college and semester. The information was submitted to the descriptive statistical analysis using the *Statistical Package for Social Science* (SPSS) software at the significance level $p<05$. Chi-square tests were used for categorical variables, while numerical data were submitted to one-way analysis of variance (one-way ANOVA), followed by the Bonferroni correction.

RESULTS

The sample consisted of 114 students, of which 67 (58.8%) were from a private college (University 1) and 47 (41.2%) from a public college (University 2). There was a higher prevalence of females (75/65.8%) in the age group above 20 years (65/57.0%) and of part- time students, being 36 (31.6%) in the morning and 31 (27.2%) in the evening. Besides, only 13 (11.4%) students attended elective subjects, 20 (17.5%) attended subjects with internships, and 8 (7.0%) reported being economically active (**Table 1**).

Table 1 - University students amount and percentage according to their specifications (university, shift, semester, gender, age, elective course, traineeship, work).

University	N	%
University 1	67	58,8
University 2	47	41,2
Shift		
Morning	36	31,6
Night	31	27,2
Full time	47	41,2
Semester		
1	49	43,0
5	42	36,8
10	23	20,2
Gender		
Female	75	65,8
Masculine	39	34,2
Age		
Until 20 years	49	43,0
More than 20 years	65	57,0
Elective Course		
No	101	88,6
Yes	13	11,4
Internship		
No	94	82,5
Yes	20	17,5
Work		
No	106	93,0
Yes	8	7,0

Subtitle: Data expressed in absolute frequency and percentage.
Source: Gomes AK, et al., 2024.

As shown in **Table 2**, regarding the evaluation of the presence of TMD in students, there was a higher prevalence of signs and symptoms of mild TMD (48.2%), when compared to moderate (17.5%) and severe (7.9%). In addition, most of the sample did not report stress (52.6%), anxiety (72.8%) or depression (63.2%). However, most students reported poor sleep quality (70.5%), and there were significant statistical changes when crossing the data.

Table 2 - Distribution of the university students according to DTM presence or severity degree (FAI), to psychosomatic factors found (DASS-21) as well as sleep disturbances verified (PSQI).

Fonseca	**N**	**%**
No TMD	30	26,3
Mild TMD	55	48,2
Moderate TMD	20	17,5
Severe TMD	9	7,9
Stress		
Normal	60	52,6
Mild	26	22,8
Moderate	16	14,0
Severe	9	7,9
Extremely severe	3	2,6
Anxiety		
Normal	83	72,8
Mild	3	2,6
Moderate	13	11,4
Severe	8	7,0
Extremely severe	7	6,1
Depression		
Normal	72	63,2
Mild	11	9,6
Moderate	15	13,2
Severe	9	7,9
Extremely severe	7	6,1
Pittsburg		
Good sleep quality	18	17,1
Poor sleep quality	74	70,5
Sleep disturbance	13	12,4

Subtitle: Data expressed in absolute frequency and percentage.
Source: Gomes AK, et al., 2024.

When crossing the data from **Tables 1** and **2**, there were statistically significant differences regarding the presence of poor sleep quality in students with TMD (p=0.046) (Table 3). Also, students who presented stress were more anxious (p<0.001), depressed (p<0.001) and had poor sleep quality (p<0.003) (**Table 4**).

Table 3 - Distribution of the university students according to association between the prevalence of TMD signs and symptoms and table's 1 data (crossing).

	TMD						
	Total	**No**		**Yes**		**p-Value**	
University							
University 1	67	58,8%	17	56,7%	50	59,5%	**0,785**
University 2	47	41,2%	13	43,3%	34	40,5%	
Shift							
Morning	36	31,6%	8	26,7%	28	33,3%	**0,789**
Night	31	27,2%	9	30,0%	22	26,2%	
Full time	47	41,2%	13	43,3%	34	40,5%	
Semester							
1	49	43,0%	11	36,7%	38	45,2%	**0,656**
5	42	36,8%	13	43,3%	29	34,5%	
10	23	20,2%	6	20,0%	17	20,2%	
Gender							
Female	75	65,8%	20	66,7%	55	65,5%	**0,906**
Masculine	39	34,2%	10	33,3%	29	34,5%	
Age							
Until 20y	49	43,0%	12	40,0%	37	44,0%	**0,701**
More than 20y	65	57,0%	18	60,0%	47	56,0%	
Elective course							
No	101	88,6%	26	86,7%	75	89,3%	**0,698**
Yes	13	11,4%	4	13,3%	9	10,7%	
Internship							
No	94	82,5%	24	80,0%	70	83,3%	**0,680**
Yes	20	17,5%	6	20,0%	14	16,7%	
Work							
No	106	93,0%	29	96,7%	77	91,7%	**0,357**
Yes	8	7,0%	1	3,3%	7	8,3%	
Stress							
No	59	51,8%	20	66,7%	39	46,4%	**0,057**
Yes	55	48,2%	10	33,3%	45	53,6%	
Anxiety							
No	83	72,8%	27*	90,0%	56	66,7%	***0,014***
Yes	31	27,2%	3	10,0%	28	33,3%	
Depression							
No	72	63,2%	23	76,7%	49	58,3%	**0,074**
Yes	42	36,8%	7	23,3%	35	41,7%	
Pittsburg poor sleep quality							
No	18	17,1%	8*	29,6%	10	12,8%	***0,046***
Yes	87	82,9%	19	70,4%	68	87,2%	

Subtitle: *p<0,05, Fisher's exact test or Pearson's chi-square test (n, %).
Source: Gomes AK, et al., 2024.

Table 4 - Distribution of the university students according to association between the stress prevalence and table's 1 data (crossing).

	Stress						
	Total	**No**		**Yes**		**p-Value**	
University							
University 1	67	58,%8	36	61,0%	31	56,4%	**0,614**
University 2	47	41,2%	23	39,0%	24	43,6%	
Shift							
Morning	36	31,6%	19	32,2%	17	30,9%	**0,868**
Night	31	27,2%	17	28,8%	14	25,5%	
Full time	47	41,2%	23	39,0%	24	43,6%	
Semester							
1	49	43,0%	22	37,3%	27	49,1%	**0,379**
5	42	36,8%	25	42,4%	17	30,9%	
10	23	20,2%	12	20,3%	11	20,0%	
Gender							
Female	75	65,8%	42	71,2%	33	60,0%	**0,208**
Masculine	39	34,2%	17	28,8%	22	40,0%	
Age							
Until 20y	49	43,0%	22	37,3%	27	49,1%	**0,203**
More than 20y	65	57,0%	37	62,7%	28	50,9%	
Elective Course							
No	101	88,6%	53	89,8%	48	87,3%	**0,668**
Yes	13	11,4%	6	10,2%	7	12,7%	
Internship							
No	94	82,5%	47	79,7%	47	85,5%	**0,416**
Yes	20	17,5%	12	20,3%	8	14,5%	
Work							
No	106	93,0%	55	93,2%	51	92,7%	**0,918**
Yes	8	7,0%	4	6,8%	4	7,3%	
Anxiety							
No	83	72,8%	59	100,0%	24	43,6%	***0,001***
Yes	31	27,2%	0	0,0%	31	56,4%	
Depression							
No	72	63,2%	53	89,8%	19	34,5%	***0,001***
Yes	42	36,8%	6	10,2%	36	65,5%	
Pittsburg poor sleep quality							
No	18	17,1%	15	27,8%	3	5,9%	***0,003***
Yes	87	82,9%	39	72,2%	48	94,1%	

Subtitle: *p<0,05, Fisher's exact test or Pearson's chi-square test (n, %).
Source: Gomes AK, et al., 2024.

Regarding anxiety, 77.4% of anxious students presented depression (p<0.001), and 100% demonstrated poor sleep quality (p=0.004) (**Table 5**). In addition, 97.4% of the students with depression also demonstrated poor sleep quality (p=0.003) (**Table 6**).

Table 5 - Distribution of the university students according to association between the anxiety prevalence and table's 1 data (crossing).

	Anxiety						
	Total	**No**		**Yes**		**p-Value**	
University							
University 1	67	58,8%	51	61,4%	16	51,6%	**0,343**
University 2	47	41,2%	32	38,6%	15	48,4%	
Shift							
Morning	36	31,6%	24	28,9%	12	38,7%	**0,110**
Night	31	27,2%	27	32,5%	4	12,9%	
Full time	47	41,2%	32	38,6%	15	48,4%	
Semester							
1	49	43,0%	32	38,6%	17	54,8%	**0,067**
5	42	36,8%	30	36,1%	12	38,7%	
10	23	20,2%	21	25,3%	2	6,5%	
Gender							
Female	75	65,8%	60*	72,3%	15	48,4%	**0,017**
Masculine	39	34,2%	23	27,7%	16	51,6%	
Age							
Until 20y	49	43,0%	33	39,8%	16	51,6%	**0,255**
More than 20y	65	57,0%	50	60,2%	15	48,4%	
Elective Course							
No	101	88,6%	73	88,0%	28	90,3%	**0,723**
Yes	13	11,4%	10	12,0%	3	9,7%	
Internship							
No	94	82,5%	64	77,1%	30	96,8%	**0,014**
Yes	20	17,5%	19*	22,9%	1	3,2%	
Work							
No	106	93,0%	77	92,8%	29	93,5%	**0,885**
yes	8	7,0%	6	7,2%	2	6,5%	
Depression							
No	72	63,2%	65	78,3%	7	22,6%	**0,001**
Yes	42	36,8%	18	21,7%	24	77,4%	
Pittsburg poor sleep quality							
No	18	17,1%	18	23,75%	0	0,0%	**0,004**
Yes	87	82,9%	58	76,3%	29	100,0%	

Subtitle: *p<0,05, Fisher's exact test or Pearson's chi-square test (n, %).
Source: Gomes AKP, et al., 2024.

Table 6 - Distribution of the university students according to association between the depression prevalence and table's 1 data (crossing).

Depression							
Total		**No**		**Yes**		**p-Value**	
University							
University 1	67	58,8%	44	61,1%	23	54,8%	**0,506**
University 2	47	41,2%	28	38,9%	19	45,2%	
Shift							
Full time	36	31,6%	19	26,4%	17	40,5%	**0,049**
	31	27,2%	25	34,75	6	14,3%	
	47	41,2	32	38,6%	15	48,4%	
Semester							
1	49	43,0	32	38,6%	17	54,8%	**0,067**
5	42	36,8	30	36,1%	12	38,7%	
10	23	20,2	21	25,3%	2	6,5%	
Gender							
Female	75	65,8%	60	72,3%	15	48,4%	**0,017**
Masculine	39	34,2%	23	27,7%	16	51,6%	
Age							
Until 20y	49	43,0	33	39,8%	16	51,6%	**0,255**
More than 20y	65	57,0	50	60,2%	15	48,4%	
Elective course							
No	101	88,6	73	88,0%	28	90,3%	**0,723**
Yes	13	11,4%	10	12,0%	3	9,7%	
Internship							
No	94	82,5	64	77,1%	30	96,8%	**0,014**
Yes	20	17,5	19	22,9%	1	3,2%	
Work							
No	106	93,0	77	92,8%	29	93,5%	**0,885**
yes	8	7,0%	6	7,2%	2	6,5%	
Depression							
No	72	63,2	65	78,3%	7	22,6%	**0,001**
Yes	42	36,8	18	21,75	24	77,4%	
Pittsburg poor sleep quality							
No	18	17,1	18	23,7%	0	0,0%	**0,004**
Yes	87	82,9	58	76,3%	29	100,0%	

Subtitle: *p<0,05, Fisher's exact test or Pearson's chi-square test (n, %).
Source: Gomes AK, et al., 2024.

DISCUSSION

The relationship of TMDs with psychosomatic factors has increased and has been widely observed in university students (SOUTHWELL J, et al., 1990). Knowing that the academic environment may generate multifactorial changes in the daily life of students, some studies have exposed the development of TMDs in the face of situations that change the physiological/emotional system on certain occasions (SOUTHWELL J, et al., 1990; PEDRONI CR, et al., 2003). Among university students, it is estimated that 41.3% to 68.6% present some sign or symptom of TMD (PEDRONI CR, et al., 2003).

In this study, the researchers evaluated 114 students. Most of them presented mild TMD (48.2%), followed by moderate (17.5%) and severe (7.9%) TMD, corroborating the study of Habib SR, et al. (2015), which evaluated 400 participants, obtaining the following results: 36.1% presented mild TMD, 9.6% moderate, and only 1.1% was classified as severe TMD.

Thus, although there is no need for intervention or specific treatment for the signs and symptoms of mild TMD, the importance of constant monitoring and more conservative therapies should be emphasized. Some examples are the guidelines based on the diagnosis in order to avoid worsening of the clinical picture presented (HABIB SR, et al., 2015; CAMPI LB, et al., 2013).

A more invasive treatment should be considered only in the persistence of painful symptomatology and functional impairment, requiring pharmacological therapy for the treatment (STÜERMER VM, 2020).Studies like that of Benassi GR, et al. (2020) found a relationship between the period in which students are enrolled and the degree of TMD (p=0.012) and observed that, compared to Group 2 (5th semester), the probability of Group 1 (1st semester) to present some degree of TMD was seven times higher. When comparing Group 3 (9th semester) with Group 2, it was found that group 3 demonstrated 4.57 times more chance of having some degree of TMD.

Therefore, they concluded from the collected data that the students of the first semesters presented a higher chance of developing TMD, probably because the first semesters are usually composed of several disciplines, for example, and the concern with academic performance can be considered more significant (BENASSI GR, et al., 2020; BURRIS JL, et al., 2010).

However, in the present study, no significant statistical relationship was observed between the semesters attended and the degree of TMD. In this context, it is important to highlight the association between TMDs and the concept of the biopsychosocial model. It considers psychological, biological and sociological issues as body systems, as well as the cardiovascular system or skeletal muscle, there being no separation between body and mind (CAMPI LB, et al., 2013).

Pain is currently defined as a sensory and affective experience, and the biopsychosocial approach describes pain as a multidimensional and dynamic interaction between physiological, psychological and social factors (EDWARDS RR, et al., 2016). Therefore, the importance of using instruments for such psychosocial aspects in clinical practice is highlighted, contemplating a more effective assessment of patients (EDWARDS RR, et al., 2016).

It has been observed that individuals with TMD have a strong potential to demonstrate significant psychological changes, being exemplified in the literature by high rates of anxiety, mood disorders and stress (CAMPI LB, et al., 2013; BURRIS JL, et al., 2010). Such symptomatologies can increase the activity of pain precipitation in psychophysiological systems, which are also activated by harmful events (BURRIS JL, et al., 2010).

In this research, the students who developed TMD reported having a lower quality of sleep (p=0.046), and there are studies, such as that of Benassi GR, et al. (2020), that defend the relationship presented. According to Schwarzenbeck, A (2009), TMDs can be associated with sleep and other disorders, such as reduced appetite, reduced libido, increased irritability and anxiety.

However, the study of Alahmary AW (2019) reported that the association between TMD and anxiety was statistically insignificant. With regard to stress, in this study, most individuals who reported its occurrence had

higher rates of anxiety (p<0.001), as well as higher rates of depression (p<0.001) and poor sleep quality (p=0.003). With regard to stress, in this study, most of the individuals who reported its occurrence had higher levels of anxiety. A systematic review evaluating 33 studies identified an association between anxiety and TMD in the quantitative analysis, corroborating our findings. (SANTOS EA, et al., 2022). Anxiety is a comorbidity often associated with TMJ disorders and other painful musculoskeletal conditions (SANTOS EA., et al, 2022). This psychosocial aspect can release neurotransmitters related to parafunctional habits (SANTOS EA, et al., 2022), which are oral behaviors that constitute a series of activities that occur beyond the physiological functions of the stomatognathic system (REDA B, et al., 2022).

Emotional tension and stress can interfere with the biological processes of pain perception and transmission and promote excessive and continuous muscular activity which, progressively, can cause damage to the TMJ and associated structures, as well as contributing to the emergence of these habits (SCHWARZENBECK A, 2009; PAULINO MR, et al., 2018).

Depression is characterized by a depressed mood, lack of concentration, low self-esteem, interrupted sleep, loss of pleasure or interest in activities, depressed mood (LUO LY, et al., 2023). A high prevalence of moderate to severe depression has been observed in TMD patients, ranging from 21.4 to 60.1% (DE LA TORRE CG, et al., 2018).

A meta-analysis evaluating 736 patients of both sexes found that interventions to control TMD were beneficial in reducing levels of depression and anxiety, highlighting the mutual relationship between TMD and the psychosocial aspects evaluated (LUO LY, et al., 2023). These findings emphasize the role of the dental surgeon in detecting any symptoms of anxiety and/or depression in patients with TMD and suggest a supportive role of interventions for this dysfunction in improving anxiety and depression (LUO LY, et al., 2023).

Monteiro DR, et al. (2011) indicated that this relationship of psychosomatic factors and TMD are more present in females. In the present study, there was no significant association between the prevalence of psychosomatic factors and TMD in relation to sex, corroborating with the study of Alahmary AW (2019). In this study, most men were more anxious (51.6%), even though the sample was composed of more women (75) than men (39). In this context, besides studies that have shown a strong relationship between TMD and anxiety, authors also correlated TMD to depressive states (MOTA LJ, et al., 2015; FERREIRA KDM, et al., 2009; GIANNAKOPOULOS NN, et al., 2010). Paulino MR, et al. (2018) reported that depression plays an important role in the severity and progression of TMDs, corroborating with some studies in the literature (FERNANDES G, et al., 2013; CALIXTRE LB, et al., 2014; MINGHELLI B, et al., 2014).

According to Minghelli B, et al. (2014), who argue that stress is also linked to psychological disorders such as anxiety and depression, we can say that the present study also supports this relationship, in which we can see that the students that are more anxious had higher rates of depression (p<0.001) and poor sleep quality (p=0.004). However, it is important to highlight that in the present study, as well as in the study by Lucena IM, et al. (2012), there was no relationship between TMD and depression.

CONCLUSION

We can conclude that the investigated population is subjected to important risk coefficients for the development and/or progression of temporomandibular joint dysfunction and psychosomatic factors, since the prevalence of signs and symptoms of TMD in students has been proven, although predominantly mild (48.2%) and from psychosomatic factors, as well. In addition, the application of the questionnaires proved to be crucial for the investigative survey, signaling the possible need for disclosure and clarification in the university environment about TMDs and their association with the factors analyzed in the present study, in order to help in the early diagnosis and prevention of worsening.

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