ORIGINAL ARTICLE

Prevalence of temporomandibular joint dysfunction and different levels of anxiety among college students*

Prevalência da disfunção temporomandibular e de diferentes níveis de ansiedade em estudantes universitários

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SUMMARY

BACKGROUND AND OBJECTIVES: Orofacial pain is receiving more public health attention due to its increasing incidence, the involvement of increasingly younger age groups, its possible association to mental health and its implications on the quality of life of affected patients. This research aimed at evaluating the prevalence of temporomandibular joint dysfunction (TMJD) and of different levels of anxiety among students of Biological Sciences, Physical Education, Nursing, Pharmacy, Physical Therapy, Dentistry and Psychology of the State University of Paraíba.

METHOD: Transversal study with inductive approach and descriptive and inferential statistical analysis involving 336 college students. Data were collected by the Anamnesis Index and the State-Trait Anxiety Inventory (IDATE). Pearson's Chi-square and Fisher Exact tests were used with a confidence interval of 95%.

RESULTS: TMJD was mild in 48.2% of individuals, moderate in 11.3% and severe in 3%. TMJD was more frequent among single individuals, females and those between 18 and 22 years of age, with emotional stress symptoms. Physical therapy students had a significantly higher need for TMJD treatment and the highest levels of anxiety.

CONCLUSION: There has been a high incidence of TMJD among college students of different courses, with higher prevalence among Physical Therapy students.

Keywords: Anxiety, Health Sciences students, Prevalence, Temporomandibular joint dysfunction syndrome.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor orofacial tem merecido maior ênfase em saúde pública, pela sua incidência crescente, a abrangência de grupos etários cada vez mais precoces, uma associação possível com a saúde mental e as implicações na qualidade de vida dos acometidos. Esta pesquisa teve como objetivo avaliar a prevalência da disfunção temporomandibular (DTM) e dos diferentes níveis de ansiedade, em acadêmicos dos cursos de Ciências Biológicas, Educação Física, Enfermagem, Farmácia, Fisioterapia, Odontologia e Psicologia da Universidade Estadual da Paraíba.

MÉTODO: Estudo transversal, com abordagem indutiva e análise estatística descritiva e inferencial com 336 acadêmicos. Para a coleta dos dados, aplicaram-se formulários contendo o Índice Anamnésico, e o Inventário de Ansiedade Traço-Estado (IDATE). Utilizaram-se os testes Qui-quadrado de Pearson e Exato de Fisher, adotando-se um intervalo de confiança de 95%.

RESULTADOS: 48,2% dos indivíduos apresentavam DTM leve, 11,3% moderada e 3% grave. A DTM foi mais frequente em indivíduos solteiros, do gênero femi-

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nino, na faixa etária dos 18 aos 22 anos, com sintoma de tensão emocional. Os acadêmicos de Fisioterapia apresentaram significativamente maior necessidade de tratamento para DTM e valores mais elevados do nível de ansiedade.

CONCLUSÃO: Identificou-se elevada incidência de DTM nos acadêmicos dos diversos cursos, com prevalência maior nos de Fisioterapia.

Descritores: Ansiedade, Estudantes de Ciências da Saúde, Prevalência, Síndrome da disfunção da articulação temporomandibular.

INTRODUCTION

Temporomandibular dysfunctions (TMD) are disorders involving masticatory muscles, the temporomandibular joint (TMJ) and its associated structures. Such changes affect a large part of the population and may be related to unpleasant signs and symptoms, such masticatory muscles or TMJ pain, joint noises, mouth opening limitations, gum retraction, inadequate occlusion, auditory disorders, headache, and sensitivity in all stomatognathic and cervical system, among others[1,2].

The increased incidence of TMD-related chronic orofacial pain and its repercussion on quality of life (QL) of individuals have deserved attention of public health investigations. It is known that such conditions are associated to multifactorial etiology, with pathophysiological, social, cultural and psychological components, giving more importance to the latter[3].

Involved psychological factors in TMD situations may be divided into behavioral, such as bruxism, emotional, such as stress, anxiety and depression, and cognitive, with memory-related aspects. Anxiety disorders are a major challenge for modern society, especially in the areas of attention to human beings, reason why there is an increasing search for the understanding of factors which may trigger stress and its implications[4].

Health professionals have high levels of anxiety, which starts during graduation years and brings repercussions not only in academic performance, but also in increased risk for other diseases[5].

For early diagnosis and possibility of intervention, it is necessary to identify risk groups through accurate tools to establish the epidemiological profile of the problem[6]. In this context, and considering information gaps about TMD and anxiety among Biological and Health Sciences students, this study was developed.

This study aimed at evaluating the prevalence of TMD and different levels of anxiety among students of the State University of Paraíba, in Campina Grande.

METHOD

This is a transversal study with inductive and qualitative approach, with data descriptive and inferential analysis. The study involved graduation courses in Biological Sciences, Physical Education, Nursing, Pharmacy, Physical Therapy, Dentistry and Psychology, belonging to the Center of Biological and Health Sciences (CCBS), State University of Paraíba (UEPB), in Campina Grande.

To define sample size, the universe of 2507 students of both genders enrolled during the first semester of 2009 was considered. Inclusion criterion was age above 18 years.

The list of investigated variables included: TMD presence, degree and symptoms, levels of anxiety, age group, gender, marital status, graduation course and year of the related course being attended.

Data collection technique was extensive direct observation, during breaks between classes, for each department. To evaluate TMD degree, a card with personal data was used, which had a form with the DMF Anamnestic Index. To be able to classify TMD degree, values from zero to 10 were attributed to each question, so that "yes" had score 10; "sometimes", 5 and "no" corresponded to zero. After adding all results, it was possible to establish TMD degree of severity presented by participants. According to patterns determined by the index, zero from 15 was considered no TMD; 20 to 40 with mild TMD; 45 to 65, moderate TMD; and 70 to 100, severe TMD.

The self-applicable Anxiety State-Trait Inventory (ASTI) was applied. This inventory is made up of two different scales prepared to measure anxiety state (Part I) and trait (Part II). In part I, State scale requires participants to describe how do they feel "now, in this moment" with regard to the 20 items presented in a 4-point Likert scale: 1 – no for sure; 2 – a little; 3 – a lot; 4 – a great deal.

Similarly in Part II, Trait scale was also made up of 20 items, but participants were oriented to answer how "they feel in general" according to a new 4-point Likert scale: 1 – almost never; 2 – sometimes; 3 – frequently; 4 – almost always. Each scale had 20 statements and participants would score each answer from 1 to 4, obtaining a final score which could be at least 20 and at the utmost 80. Low scores meant low levels of anxiety and high scores meant high levels of anxiety. For evaluation of results, the following characterization according to theoretical and methodological referential was considered: 20 to 40 = low level of anxiety; 41 to 60 = moderate level of anxiety; 61 to 80 = high level of anxiety.

Data were analyzed with descriptive and inferential sta-

tistic techniques, adopting a confidence interval of 95%, with the aid of the SPSS software (Statistical Package for Social Science), release 13.0.

This study was approved by the Research Ethics Committee, UEPB, under protocol CAAE 0548.0.133.000-08 after previous signature of the Free and Informed Consent Term, according to Resolution 196/96 of the Brazilian National Health Council.

RESULTS

From a universe of 2507 students, total sample involved 336 students aged between 18 and 38 years, distributed among UEPB CCBS graduation courses.

As to age groups, 42% of volunteers had 23 to 27 years of age, 41.3% 18 to 22 years of age, 11.9% 28 to 32 years of age and 4.8% 33 to 38 years of age. According to gender, 64.3% were females and 35.7% were males. According to marital status, 91.4% were single and 8.6% were married or with stable union.

With regard to the graduation course attended, 19.4% belonged to Nursing, followed by 19% Biological Sciences, 15.5% Physical Education, 13.4% Psychology, 11.9% Physical Therapy and 10.4% respectively for Pharmacy and Dentistry.

Taking into consideration the moment of the course, 21% of participants were equally distributed between the first and fourth year of each course and 13.2% belonged to the fifth year.

The prevalence of TMD in its different degrees was established in 62.5% of students with such condition and 37.5% without it. Among those with TMD, 48.2% had it mild, 11.3% moderate and just 3% had severe TMD.

There were statistically significant differences between the prevalence of TMD and the course variable ($p < 0.05$). According to the attended course, it has been observed that Biological Sciences students, daily shift, had the highest prevalence of TMD while Physical Education had the lowest.

According to table 1, absence of TMD was higher for males (42.5%), as well as the mildest degree of this dysfunction (51.7%), being not only the moderate degree (15.7%) but also the severe degree (3.3%) significantly higher for females. In addition, it has been observed that the absence of TMD has prevailed among Physical Education students (55.8%), mild TMD was more frequent among Biological Sciences, daily shift, students (63.9%), while Physical Therapy was the course with the largest number of students needing treatment (moderate and severe TMD, with 15% and 7.5%, respectively).

Table 1 – Evaluation of temporomandibular dysfunction degrees.

Variables	Temporomandibular Dysfunction								Total		p value
	No TMD		Mild		Moderate		Severe				
	n	%	N	%	N	%	n	%	N	%	
Age group											
18 to 22	46	33.1	70	50.4	22	15.8	1	0.7	139	100.0	$p^{(1)} = 0.137$
23 to 27	55	39.0	66	46.8	12	8.5	8	5.7	141	100.0	
28 to 32	16	40.0	19	47.5	4	10.0	1	2.5	40	100.0	
33 to 38	9	56.3	7	43.7	-	-	-	-	16	100.0	
Gender											
Male	51	42.5	62	51.7	4	3.3	3	2.5	120	100.0	$p^{(2)} = 0.006$*
Female	75	34.7	100	46.3	34	15.7	7	3.3	216	100.0	
Marital status											
Single	113	36.8	152	49.5	35	11.4	7	2.3	307	100.0	$p^{(1)} = 0.075$
Married	13	44.9	10	34.5	3	10.3	3	10.3	29	100.0	

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Table 1 – continuance

Variables	Temporomandibular Dysfunction								Total		p value
	No TMD		Mild		Moderate		Severe				
	n	%	N	%	N	%	n	%	N	%	
Courses											
Biology Day	6	16.7	23	63.9	7	19.4	-	-	36	100.0	$p^{(3)}$ = 0.010*
Biology Evening	12	42.9	11	39.3	3	10.7	2	7.1	28	100.0	
Phisical Education	29	55.8	16	30.8	6	11.5	1	1.9	52	100.0	
Nursing	26	40.0	32	49.2	7	10.8	-	-	65	100.0	
Pharmacy	12	34.3	19	54.3	2	5.7	2	5.7	35	100.0	
Physical Therapy	10	25.0	21	52.5	6	15.0	3	7.5	40	100.0	
Dentistry	10	28.6	20	57.1	5	14.3	-	-	35	100.0	
Psychology	21	46.8	20	44.4	2	4.4	2	4.4	45	100.0	
Year of the course											
1st	23	31.5	41	56.2	7	9.6	2	2.7	73	100.0	$p^{(3)}$ = 0.670
2nd	28	38.3	33	45.2	11	15.1	1	1.4	73	100.0	
3rd	23	31.5	37	50.7	10	13.7	3	4.1	73	100.0	
4th	34	46.6	29	39.7	7	9.6	3	4.1	73	100.0	
5th	18	40.9	22	50.0	3	6.8	1	2.3	44	100.0	
Total group	126	37.5	162	48.2	38	11.3	10	3.0	336	100.0	

* = Significant difference at 5.0%; (1) = Fisher's Exact test; (2) = Pearson's Chi-square test; (3) = Likelihood test.

Table 2 – Evaluation of the anxiety scale-state according to course and course moment.

Variables	Anxiety – State				Total		p value	OR (CI to 95%)
	Low		Moderate/Highh					
	n	%	N	%	n	%		
Courses								
Biology Day	10	27.8	26	72.2	36	100.0	$p^{(1)}$ = 0.033*	1.06 (0.40 to 2.83)
Biology Evening	10	35.7	18	64.3	28	100.0		1.53 (0.55 to 4.22)
Physical Education	28	53.8	24	46.2	52	100.0		3.21 (1.36 to 7.56)
Nursing	24	36.9	41	63.1	65	100.0		1.61 (0.70 to 3.70)
Pharmacy	10	28.6	25	71.4	35	100.0		1.10 (0.41 to 2.95)

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Table 2 – continuance

Variables	Anxiety – State				Total		p value	OR (CI to 95%)
	Low		Moderate/Highh					
	n	%	N	%	n	%		
Physical Therapy	8	20.0	32	80.0	40	100.0		0.69 (0.25 to 1.90)
Dentistry	11	31.4	24	68.6	35	100.0		1.26 (0.48 to 3.33)
Psychology	12	26.7	33	73.3	45	100.0		1.00
Years of course								
1st	24	32.9	49	67.1	73	100.0	p(1) = 0.975	1.05 (0.47 to 2.34)
2nd	24	32.9	49	67.1	73	100.0		1.05 (0.47 to 2.34)
3rd	24	32.9	49	67.1	73	100.0		1.05 (0.47 to 2.34)
4th	27	37.0	46	63.0	73	100.0		1.26 (0.57 to 2.78)
5th	14	31.8	30	68.2	44	100.0		1.00
Total group	113	33.6	223	66.4	336	100.0		

* = Significant difference to 5.0%; (1) = Pearson's Chi-square test.

Table 3 – Evaluation of anxiety scale-trait according to course and course moment.

Variables	Anxiety – Trait				Total		p value	OR (CI to 95%)
	Low		Moderate/High					
	n	%	N	%	n	%		
Courses								
Biology day	7	19.4	29	80.6	36	100.0	p(1) = 0.838	1.12 (0.36 to 3.44)
Biology evening	8	28.6	20	71.4	28	100.0		1.85 (0.60 to 5.68)
Physical education	13	25.0	39	75.0	52	100.0		1.54 (0.57 to 4.15)
Nursing	17	26.2	48	73.8	65	100.0		1.64 (0.64 to 4.21)
Pharmacy	7	20.0	28	80.0	35	100.0		1.16 (0.38 to 3.57)
Physical therapy	6	15.0	34	85.0	40	100.0		0.82 (0.26 to 2.59)
Dentistry	8	22.9	27	77.1	35	100.0		1.37 (0.46 to 4.11)
Psychology	8	17.8	37	82.2	45	100.0		1.00
Years of course								
1st	16	21.9	57	78.1	73	100.0	p(1) = 0.550	1.00

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Table 3 – continuance

Variables	Ansiedade – Traço				Total		Valor de p	OR (IC to 95%)
	Baixo		Médio/Alto					
	n	%	N	%	n	%		
2nd	13	17.8	60	82.2	73	100.0		0.77 (0.34 to 1.75)
3rd	14	19.2	59	80.8	73	100.0		0.85 (0.38 to 1.89)
4th	21	28.8	52	71.2	73	100.0		1.44 (0.68 to 3.05)
5th	10	22.7	34	77.3	44	100.0		1.05 (0.43 to 2.57)
Total group	74	22.0	262	78.0	336	100.0		

(1): Pearson's Chi-square test.

Table 4 – Prevalence of temporomandibular dysfunction according to levels of anxiety.

Level of anxiety	TMD				Total		p value	OR (CI to 95%)
	Yes		No					
	N	%	n	%	n	%		
Anxiety-state								
Low	61	54.0	52	46.0	113	100.0	p(1) = 0.022*	1.00
Moderate/ High	149	66.8	74	33.2	223	100.0		1.72 (1.08 to 2.73)
Anxiety-trait								
Low	38	51.4	36	48.6	74	100.0	p(1) = 0.025*	1.00
Moderate/ High	172	65.6	90	34.4	262	100.0		1.81 (1.07 to 3.05)
Total Group	210	62.5	126	37.5	336	100.0		

* = Significant difference to 5.0%; (1) = Pearson's Chi-square test.

Table 5 – Temporomandibular dysfunction degrees according to the level of anxiety.

Variables	DTM								Total		p value
	No TMD		Mild		Moderate		Severe				
	n	%	n	%	n	%	n	%	N	%	
Anxiety-state											
Low	52	46.0	52	46.0	8	7.1	1	0.9	113	100.0	$p^{(1)}$ = 0.036*
Moderate/ High	74	33.2	110	49.3	30	13.5	9	4.0	223	100.0	
Anxiety-trait											
Low	36	48.6	30	40.5	7	9.5	1	1.4	74	100.0	$p^{(1)}$ = 0.163
Moderate/ High	90	34.4	132	50.4	31	11.8	9	3.4	262	100.0	
Total Group	126	37.5	162	48.2	38	11.3	10	3.0	336	100.0	

(*) = Significant difference to 5.0%; (1) = Pearson's Chi-square test.

DMF Anamnestic Index results have identified in a larger percentage the subjective symptom of emotional stress (61.3%), according to the self-perception of respondents as stressed people, followed by nape or neck pain (47.3%), frequent headache (45.2%), habit of grinding or clenching the teeth (36.3%), TMJ noise (35.8%), lack of a good contact between upper and lower teeth during mouth closing (32.7%), tiredness or discomfort when chewing (25.3%), earache (23.5%), mouth opening difficulties (14.9%) and difficulty to perform other mandible movements (13.7%).

In evaluating different levels of anxiety, it was observed that the anxiety-state index (at the moment of the research) was moderate for 66.1% of students, low for 33.6% and high for 0.3%. According to the anxiety-trait analysis (in general), 77% of students had moderate levels, 22% low levels and 0.3% high levels.

In analyzing the prevalence of levels of anxiety in different courses and years, there has only been a significant association between anxiety-state and the course. There have been no statistically significant differences among remaining variables (Tables 2 and 3).

The relationship between levels of anxiety and TMD is shown in table 4, where statistically significant differences were observed among described variables (both anxiety-state index and anxiety trait index). It was observed a higher prevalence of moderate / high level for TMD individuals and of low level for TMD-free individuals.

When relating TMD degrees and the levels of anxiety, it was observed that there has only been significant association between TMD degrees and anxiety-state ($p < 0.05$), so that moderate / high level was more frequent in mild TMD individuals and the highest percentage difference was seen in the moderate level, as shown in table 5.

DISCUSSION

The identification of possible TMD signs and symptoms is a major resource to early diagnose this dysfunction. In this context, the use of indices has been widely spread in the literature, especially when validated, easy to apply and interpret and aiming at standardization for data comparison[7-9].

The influence of stress and anxiety on pressure pain threshold on masticatory muscles has been recognized, in addition to subjective pain reports[10-13]. With regard to risk groups, young college students have been studied,

especially due to the level of performance demands during this university phase as a fundamental factor for future professional perspectives[14,15].

The prevalence of TMD among college students established by this study (62.5%) was similar to a study where 69.23% of the students had TMD signs or symptoms[16]. There has been agreement in the order of frequency, according to degrees, but with different percentages, being most mild (61.33%) followed by moderate (27.08%) and severe (11.28%) degrees.

In a different research[17], authors have recorded a lower TMD incidence among graduation students (53.21%). They have also stressed a higher prevalence and severity of this disorder among female college students. It has to be stressed, however, that mean age of investigated students in this study was 20 years.

The higher prevalence of TMD among females might be related to gender physiological differences, such as: hormonal variations, lower muscle structure and pain threshold, emphasizing that we still need further investigations on the subject[18].

With regard to marital status, data of another research[19] have stressed that most individuals with TMD were single with no children, which is in line with our results.

CONCLUSION

Most students investigated had TMD in its different degrees, with a decreasing frequency among mild, moderate and severe degrees. Among them, Physical Therapy students had significantly higher need for TMD treatment and higher levels of anxiety.

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