

# Prevalence study of signs and symptoms of temporomandibular disorder in Brazilian college students

## *Prevalência de sinais e sintomas de disfunção temporomandibular em universitários brasileiros*

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**ABSTRACT:** The aim of this study was to evaluate the prevalence and severity of temporomandibular disorders (TMD) in Brazilian college students. A questionnaire was administered to 2,396 students. Seventy-three percent of women (mean age  $21.94 \pm 5$  years) and 27% of men (mean age  $22.41 \pm 4.8$  years) answered the questionnaire. The anamnestic index was used to classify the volunteers according to TMD severity degree. The results showed a higher percentage of men without TMD (43.74%) ( $p < 0.05$ , Chi-square test). The women exhibited some degree of severity (73.03%) at a higher frequency than men (56.26%). No significant differences were observed between sexes for a same TMD severity degree ( $p > 0.05$ ). The results indicated TMD prevalence in Brazilian college students similar to that presented in other studies found in the literature reviewed. Longitudinal studies are recommended to follow the prevalence and health care needs in this population.

**DESCRIPTORS:** Temporomandibular joint disorders; Epidemiology; Questionnaires; Prevalence.

**RESUMO:** O objetivo deste estudo foi avaliar a prevalência e a severidade da disfunção temporomandibular (DTM) em universitários brasileiros. Participaram do estudo 2.396 estudantes. Responderam ao questionário 73% de mulheres ( $21,94 \pm 5$  anos) e 27% de homens ( $22,41 \pm 4,8$  anos). O índice anamnésico foi utilizado para classificar os voluntários por nível de severidade da DTM. Os resultados mostraram uma maior porcentagem de homens sem DTM (43,74%) ( $p < 0,05$  teste Qui-quadrado). As mulheres mostraram algum nível de severidade (73,03%) com maior frequência que os homens (56,26%). Não foram evidenciadas diferenças de frequência entre os sexos classificados com DTM de mesma severidade. Os resultados indicam que a prevalência de DTM em universitários brasileiros é semelhante à de outros trabalhos presentes na literatura. Estudos longitudinais são necessários para acompanhar a prevalência e a necessidade de tratamento nessa população.

**DESCRIPTORES:** Transtornos da articulação temporomandibular; Epidemiologia; Questionários; Prevalência.

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## INTRODUCTION

The expression Temporomandibular disorders (TMD) is a generic designation for a subgroup of orofacial pain disorders. This classification comprises the pain complaints in the temporomandibular joint (TMJ) region, muscle fatigue, especially of the masticatory muscles, impaired jaw movement, and articular sounds. The multifactorial TMD etiology is related to emotional tension, occlusal interferences, teeth loss, postural deviation, masticatory muscular dysfunction, internal and external changes in TMJ structure, and the various associations of these factors<sup>6,17</sup>.

TMD prevalence studies have demonstrated a large amount of people with signs and symptoms in clinical and subclinical degrees. Thus, we have found a high TMD prevalence in non-patients, i.e., among those who do not seek for health care attention<sup>22</sup>. A non-patient prevalence study indicates closely 75% of subjects with just one TMD sign, and 33% with at least one symptom<sup>7</sup>. Another estimate related that 50 to 75% of the evaluated general population would have one TMD sign<sup>10</sup> and 20 to 25%, one symptom in any life period<sup>3</sup>. TMD severity studies should provide a health care

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need estimate in the population studied. Fonseca<sup>7</sup> (1992) advocated that subjects classified as having severe or moderate TMD should be referred to a specialized health care center or specialist. However, Kuttilla *et al.*<sup>13</sup> (1997) evidenced that just 7% of subjects classified as having severe or moderate TMD will require health care attention.

Different questionnaires covering major TMD signs and symptoms have been elaborated to simplify the evaluation in epidemiologic studies and to standardize research samples. Some of these questionnaires provide that subjects be classified by severity degree<sup>7,8,12</sup>. The anamnestic and clinical indexes proposed by Helkimo<sup>12</sup> (1974) were obtained from clinical observations. Based on Helkimo's<sup>12</sup> (1974) indexes, Fonseca<sup>7</sup> (1992) developed his anamnestic questionnaire that classifies TMD signs and symptoms as light, moderate or severe, or non-TMD. The author obtained a reliability of 95% and a good correlation with Helkimo's index ( $r = 0.6169$ ,  $p < 0.05$ ). Other advantages of Fonseca's<sup>7</sup> (1992) questionnaire are self-administration, short time of application, and low cost.

There are few TMD prevalence studies in Brazil, according to a review of the scientific literature. Garcia *et al.*<sup>9</sup> (1997) evaluated 200 college students using Fonseca's<sup>7</sup> (1992) questionnaire. The authors reported that 122 students (61%) had some degree of TMD signs or symptoms, being 84 (68.85%) of them women. Pedroni *et al.*<sup>18</sup> (2003) evaluated 50 Brazilian college students using Fonseca's<sup>7</sup> (1992) questionnaire. The authors reported that 68% of the volunteers had some degree of TMD. In 42% of them, TMD signs and symptoms were light; in 20%, moderate; and in 6%, severe.

The aim of the present study was to evaluate the prevalence and severity of temporomandibular disorders (TMD) in Brazilian college students from different federative regions.

## MATERIAL AND METHODS

The volunteer participants of this study were randomly selected among college students from 15 cities distributed in each of the five Brazilian federative regions. The possibility of training a questionnaire administrator in the college institution and consent of the institution were the criteria to chose the colleges and cities that would take part in this study. All the volunteers were informed on the study aims, and they signed a formal consent prior to participation which was approved by the Research Ethics Committee. Brief information about TMD was given to volunteers. Those who had a clinical diagnosis of TMD, with or without treatment, and those who were undergoing orthodontic treatment during the period of data collection were excluded.

The volunteers were randomly selected according to the demographic data of the 2000 Brazilian census (conducted by the Brazilian Institute of Geography and Statistics - IBGE) on the college population (Table 1). The five Brazilian federative regions were represented by 2,396 randomly chosen students, corresponding to 0.09% of Brazilian college students.

The questionnaire conceived by Fonseca<sup>7</sup> (1992) was used to evaluate the degree of TMD in volunteers of this study, as it demonstrates a high efficiency in obtaining epidemiological data. This questionnaire contains an anamnestic index, and the volunteers were classified accordingly as light TMD, moderate TMD, severe TMD or non-TMD. The questionnaire consists of 10 questions, and the possible answers are "SOMETIMES", "YES" or "NO", with a single answer to be marked for each question. The results were analyzed using the frequency distribution of the questionnaire answers according to the anamnestic index proposed by

**TABLE 1** - College students allotment in five Brazilian federative regions according to 2000 Brazilian census demographic data of the Brazilian Institute of Geography and Statistics (IBGE).

Federative Regions	College Brazilian Students (Absolute Number)	College Students in Sample Studied (Absolute Number)	Relative Frequency (Percent Values)
North	123,034	103	4.29
Center-West	253,413	212	8.85
Northeast	464,989	389	16.23
South	580,937	486	20.28
Southeast	1,441,474	1,206	50.33
Total	2,863,847	2,396	100.00

Source: IBGE, Censo Demográfico de 2000 (microdados da amostra). <http://www.ibge.gov.br/censo/numeros.shtml>.

**TABLE 2** - Severity classification of TMD signal and symptom of the studied sample (n = 2,396).

	Total	Non-TMD	Light TMD	Moderate TMD	Severe TMD
Age	22.06 ± 4.9	22.22 ± 4.7	21.95 ± 5.0	21.89 ± 5.2	22.68 ± 5.3
Sample (Percent Values)	100 (n = 2,396)	31.39 (n = 752)	50.38 (n = 1,207)	13.94 (n = 334)	4.30 (n = 103)

**TABLE 3** - Severity classification of TMD signal and symptom of the studied sample for both sexes (n = 2,396).

	Total	Non-TMD	Light TMD	Moderate TMD	Severe TMD
Women	100.00 (n = 1,765)	26.97 (n = 476)	52.46 (n = 926)	15.64 (n = 276)	4.93 (n = 87)
Men	100.00 (n = 631)	43.74 (n = 276)	44.53 (n = 281)	9.19 (n = 58)	2.54 (n = 16)

Fonseca<sup>7</sup> (1992). The positive answers ('yes' and 'sometimes') were summed. The percent values were compared between sexes and severity degrees by the Chi-square test. The  $p < 0.05$  criterion was used to establish statistical significance.

## RESULTS

In this study, 73.66% of women (mean age  $21.9 \pm 5$  years) and 26.34% of men (mean age  $22.4 \pm 4.8$  years) filled out the Fonseca<sup>7</sup> (1992) questionnaire (Table 2).

The results showed a smaller rate of volunteers classified as being free of any TMD severity degree ( $p < 0.05$ ), according to the Fonseca<sup>7</sup> (1992) anamnestic index. The rate of volunteers classified as light TMD was significantly greater ( $p < 0.05$ ) than that of volunteers with other TMD severity categories (severe, moderate and non-TMD).

The results showed a greater rate of men without TMD signs and symptoms (Table 3). The women exhibited some TMD degree (73.03%) with a greater frequency than men (56.26%). No significant differences was observed between sexes for a same severity degree ( $p > 0.05$ ). There was no significant difference between those with some degree of TMD (56.25%) and those classified as non-TMD (43.74%) in men.

The female volunteers classified as light TMD were significantly more numerous ( $p < 0.05$ ) than those which fell under other TMD severity categories (severe, moderate and non-TMD). There was no significant difference between moderate TMD and non-TMD rates in women (Table 3). The male volunteers classified as severe TMD were significantly less numerous ( $p < 0.05$ ) than those which fell under other TMD severity categories (light, moderate and non-TMD). There was no difference between sexes in a same severity category, but

women presented greater rates in all categories (Table 3).

## DISCUSSION

In this study the amount of volunteers with some TMD severity degree was higher than non-TMD subjects. Similar results were found by Pedroni *et al.*<sup>18</sup> (2003) (32%), Schiffman<sup>19</sup> (1990) (25%), Locker, Slade<sup>15</sup> (1989) (33%), and Grosfeld *et al.*<sup>11</sup> (1985) (28%) for non-TMD subjects. However, Conti<sup>4</sup> (1993) and Shiau, Chang<sup>20</sup> (1992) related a greater amount of non-TMD subjects in their studies, 58% and 59% respectively.

The light TMD degree was the most prevalent category for female and male Brazilian college students. Dekon *et al.*<sup>5</sup> (2002) and Pedroni *et al.*<sup>18</sup> (2003) found similar results, also using the Fonseca questionnaire to evaluate the prevalence of TMD signs and symptoms in Brazilian college students. However, their samples were smaller.

In this study, the prevalence of the severe TMD degree was 4.30% for both sexes. Agerberg, Inkapööl<sup>2</sup> (1990) and Kuttilla *et al.*<sup>13</sup> (1997) related that the severe TMD rate in non-patient samples ranged from 12 to 16%.

Fonseca<sup>7</sup> (1992) advocated that subjects classified as severe and moderate TMD must be referred to a specialized health care center or specialist. Thus, according to our results, 18.24% of the volunteers, corresponding to a projection of 522,365 among all Brazilian college students, must be referred to treat their TMD signs and symptoms. However, as Kuttilla *et al.*<sup>13</sup> (1997) point out, only 7% of subjects classified as having severe or moderate TMD will require health care attention in Sweden. There is not a Brazilian estimate of suitable referrals concerning TMD. According to the results of this study and to those of Kuttilla *et*

*al.*<sup>13</sup> (1997), a projection of 36,566 Brazilian college students would require health care attention. However, longitudinal studies should be undertaken to establish a reliable estimate since some subjects classified as TMD patients will present remission of their signs and/or symptoms<sup>8</sup>.

According to the results of this study, there is a greater probability of finding some degree of TMD severity in female college students than in male college students. Among non-patients, TMD signs and symptoms rates are about similar between sexes<sup>12,16</sup>. In this study, no differences were found between sexes regarding positive answers to all the Fonseca questions in a same severity category. These results are consistent with those of Magnusson *et al.*<sup>16</sup> (2000), Kuttilla *et al.*<sup>13</sup> (1997), Agerberg, Inkapööl<sup>2</sup> (1990), and Locker, Slade<sup>15</sup> (1989).

Some investigations look for explanations for the greater prevalence in women. Warren, Fried<sup>23</sup> (2001) related morphological changes in TMJs of women by means of tomographic studies. Sipila *et al.*<sup>21</sup> (2001) related that women had more depressive episodes than men. LeResche *et al.*<sup>14</sup> (1997) reported that women were more sensitive to pain. According to these authors, the TMJ estrogen receptors and the changes of hormonal levels caused by menstrual cycles influence the pain threshold in women. Other authors have related that women answer positively to a greater number of questions

because they are more careful and attentive to their health status than men<sup>1</sup>.

## CONCLUSIONS

According to the results obtained, we concluded that:

1. Among Brazilian college students, there is a prevalence of signs and symptoms of TMD in both sexes similar to that reported in the literature;
2. women showed a greater prevalence of signs and symptoms of TMD than men;
3. Brazilian college students (women and men) classified as having light TMD were more numerous in this sample;
4. the TMD prevalence in Brazilian college students was similar to that reported by other studies found in the literature reviewed, and
5. longitudinal studies are recommended to follow the prevalence and health care needs of this population.

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