

# ASSOCIATION BETWEEN BRUXISM, ALCOHOL AND TOBACCO USE AMONG BRAZILIAN STUDENTS

*Relação entre bruxismo e consumo de álcool e tabaco em estudantes brasileiros*

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## ABSTRACT

The etiology of bruxism is not well defined. Different factors affecting the central nervous system are considered as risk factors for bruxism. Dental students are not immune to the bruxism, alcohol consumption and tobacco use, despite their training, knowledge of its effects and social responsibility. The purpose of this study was to evaluate the association between bruxism, alcohol consumption and tobacco use among Brazilian dental students. Participants were chosen among 180, 17-29 year-old students at the UNESP's Dentistry School – Araçatuba Campus. They were divided into those with and without bruxism on the basis at validated clinical criteria. The clinical examinations were carried out by four standardized examiners (Intraexaminer and Interexaminer Unweighted kappa= 0.82, Weighted kappa= 0.89, respectively), in the clinic, with daylight and a tongue depressor. Bruxism was registered with the following categories: no wear facets, wear facets in enamel, dentine wear facets, facets wear half of the crown and wear facets more than 2/3 of the tooth crown. A self report validated questionnaire for alcohol consumption and tobacco use with 29 questions was completed by both groups. Fischer exact test and T-test were used and Odds Ratio and Confidence Interval was estimated. Bruxism was more frequent among cigarette smokers both in men (68.4%) and in women (56.8%). Among all respondents in this group, 82.6% reported that they would like to quit smoking and those who have tried previously to quit (76.4%) found it made them more stressed. Drinker was more frequent in the group with bruxism also (66.5% of the female and 73.5% of the male). 88.4% reported drinking alcohol because it "allows dealing with stress in an adequate way". Results suggest a positive association between bruxism and alcohol consumption and tobacco use.

**UNITERMS:** Stomatognathic system, Smoking, Alcoholism

## INTRODUCTION

Bruxism is a parafunction with tooth clenching and grinding. Particularly, the sleep bruxism is a frequent phenomenon that causes cephalalgia and muscular/joint pains to the awakening, besides an increased dental abrasion and sensibility. The etiology of sleep bruxism is uncertain: while the occlusal discrepancies and the anatomy of the bony structures of the orofacial region play only a minor role, others factors, like smoking, alcohol, drugs, systemic

diseases, stress, trauma and heredity, appear to have an important role in the sleep bruxism genesis<sup>4</sup>.

Bruxism, namely, grinding or clenching of teeth during sleep, is thought to be centrally regulated<sup>9</sup>. The following factors have been associated with bruxism: disorders in the dopaminergic system, stress, sleep dis-turbances, smoking, and alcohol consumption as well as age, gender, and genetic factors<sup>6,12</sup>. But, more detailed relationship of smoking/ alcohol consumption and bruxism has re-mained far from clear. To date,

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few studies report on the association between smoking and bruxism or alcohol consumption and bruxism, despite large variation in study design, sample size, definition of smoking and alcohol consumption, assessment of bruxism, and control for covariates<sup>1,2,5,7,10,11</sup>. However, these papers focused mainly on bruxism and smoking/ alcohol consumption status.

Alcohol consumption is a common and historical habit in many societies. However, excessive alcohol use is considered as the most important risk factor for early deaths and disabilities in the world, including heart, liver, nutritional diseases, and some types of cancer, besides causing chemical dependency and enabling the occurrence of violence and accidents<sup>2</sup>.

In the past decades, there has been the attempt to universalize the patterns of alcohol consumption, considering the consumed dose (alcohol content) and the frequency of consumption. Many definitions have been established, from moderate to heavy (heavy drinking) and abusive (binge drinking), from sporadic to dependent. The Center for Disease Control and Prevention, which has been monitoring alcohol consumption in the United States since 1995, estimates the consumption of at least one dose in the past 30 days as intense (more than one dose a day for women and more than two doses a day for men), and as abusive (initially with four or more doses for women and five or more doses for men at least once in the past 30 days)<sup>2</sup>. Nowadays, five or more doses are considered for both genders<sup>3</sup>, according to the National Institute of Alcohol Abuse and Alcoholism<sup>4</sup>. However, literature is controversial as to the benefits for the body, because even in small doses, alcohol consumption is not recommended in some situations: for children, adolescents, pregnant women, drivers, workers who deal with heavy equipment, people with depression, recovering alcoholics, among others<sup>5</sup>.

Data from the World Health Organization (WHO)<sup>19</sup> show that excessive alcohol use has increased in the world, ranging from 1.4% in India to 31.8% in Colombia, with riskier and more frequent consumption patterns in low and middle-income countries<sup>6</sup>; thus, different strategies to reduce the harmful consumption of alcohol have been discussed by WHO<sup>19</sup> and established in many countries.

In 2006, the telephone-based risk factor surveillance system for chronic diseases (VIGITEL)<sup>15</sup> was established in Brazil, and one of the assessed subjects was alcohol consumption, which enables the analysis of the patterns of alcohol use in the population aged 18 years or more<sup>7</sup>. The first version of VIGITEL<sup>15</sup> analyzed the weekly frequency of alcohol consumption for individuals who reported alcohol use in the past 30 days. For those who reported some weekly consumption, there was a question about consuming more than two doses on the same occasion for men and more than one for women. For those who answered

“yes”, the analysis was about consuming more than five doses on the same occasion for men and more than four doses for women. The second version<sup>16</sup>, in 2007, only questioned maximum limits (five and four doses for men and women, respectively), which remained the same in 2008<sup>17</sup>. In the fourth version of VIGITEL, in 2009<sup>17</sup>, these limits were altered to five or more and four or more doses, which were also maintained in 2010<sup>18</sup>. Such changes were made in order to adjust the analysis to the international standard, and reduce the duration of the interview, without losing minimum comparison.

Smoking appears to be more prevalent among bruxers. Results of a large epidemiological study of 8,888 Swedish 50-year olds showed a significant association between tobacco use and bruxism<sup>2</sup>. In a smaller study of 18 smokers and 165 nonsmokers, smokers were found to be 3 times as likely to exhibit symptoms of bruxism<sup>1</sup>. In a nationwide survey of 2,019 Canadian adults, smokers were almost twice as likely to report sleep bruxism<sup>3</sup>.

Therefore, this paper aimed to evaluate the association between bruxism, alcohol consumption and tobacco use among Brazilian dental students.

## MATERIALS AND METHODS

This research was analyzed and approved by the Ethics Committee of the School of Dentistry of Araçatuba / UNESP.

### Sample Selection

All individuals were properly informed of the study design and the procedures to be carried out by reading an information letter and signed an informed consent form, in which they agreed to participate in the research as volunteers. Recruitment of individuals was done among the Dental School of Araçatuba graduate students. Were chosen among 180, 17-29 year-old. The sample was calculated to provide proportion estimates (or prevalence) of some characteristics of interest, with absolute maximum error of 3% and 95% confidence interval. They were divided into those with and without bruxism on the basis of validated clinical criteria

### Group Establishment Based on the Presence of Bruxism.

A specific questionnaire (Figure 1) based on the one used by Molina et al.<sup>11</sup> followed by a specific physical examination, was applied in order to determine the presence of bruxism. The clinical examinations were carried out by four standardized examiners (Intraexaminer and Interexaminer Unweighted kappa= 0.82, Weighted kappa= 0.89, respectively), in the clinic, with daylight and a tongue depressor. Both the questionnaire and the physical examination were performed on the same day. Bruxism was registered with the following categories:

1. no wear facets;
2. wear facets in enamel;
3. dentine wear facets;

4. facets wear half of the crown;
5. wear facets more than 2/3 of the tooth crown.

In addition, the criteria recommended by Lavigne, et al.<sup>7</sup> was considered too:

1. Coincident tooth wear;
2. Shiny spots on restorations;
3. Masseter muscle hypertrophy upon digital palpation (scored positive if the muscle volume approximately tripled upon a voluntary clench in maximal intercuspal position).

1. Do you wake up in the morning or in the night grinding or clenching?
2. Do you feel fatigue or masticatory muscle pain upon awakening?
3. Do you wake up in the morning or in the night with locked jaws?
4. Do you feel discomfort of the teeth upon awakening?
5. Do you have a recent history of chronic dislocation of permanent or temporary restorations?
6. Do you have a recent history (last six months) of noises associated with nocturnal tooth grinding as reported by a third person?

FIGURE 1- Bruxism questionnaire

#### ➤ Group Establishment Based on the Tobacco Use

The World Health Organization (WHO)<sup>19</sup> defines as regular (or usual) tobacco use the habit of smoking at least one day in the 30 days prior to the study, regardless of frequency and intensity. Tobacco use was evaluated by questions as follows:

❖ What of the following options describes best your present smoking? The options were 1) I smoke at least 20 cigarettes a day, 2) I smoke 10–19 cigarettes a day, 3) I smoke no more than 9 cigarettes a day, 4) I smoke weekly or often but not on daily basis, 5) I smoke less than once a week, 6) I do not smoke at the moment or I have quit smoking, and 7) I have never smoked. We classified smokers as heavy smokers (at least 10 cigarettes daily), light smokers (less than 10 daily including those not smoking daily), former smokers (alternative 6), and never-smokers, who were the reference category in analyses.

❖ Do you smoke cigars, cigarillos or the pipe? The options for the answer were 1) never, 2) once in a while, and 3) regularly. Regular smokers were so rare that we dichotomized the use of these other tobacco forms as cigar users (alternatives 2 and 3) versus never.

❖ Have you tried smokeless tobacco (placed in the sulcus of the upper lip)? How many times so far? The options for the answer were 1) I have never tried, 2) I have tried once, 3) I have used 2–50 times, 4) I have used more than 50 times, and 5) I use smokeless tobacco regularly.

#### ➤ Group Establishment Based on the Alcohol Consumption

For this study, two patterns of alcohol use were considered: 1) usual – alcohol consumption in the past 30 days, regardless of the dose – and 2) abusive – consumption of more than 5 doses for men and more than 4 doses for women, in at least one occasion in

the past 30 days. Alcohol consumption was considered as a dependent variable, categorized as present or absent according to each standard. Independent variables were: age (divided into six age groups: 17, 18-19, 20-22, 23-25, 25-27, 28 years or older), ethnicity (divided into two groups, white or non-white), years of schooling (categorized in six groups: 1,2,3,4,5 and 6), inclusion in the job market (categorized in two groups, yes or no). Frequency estimates as to alcohol consumption were calculated according to independent variables, with a 95% confidence interval. Crude and adjusted prevalence ratios of alcohol consumption were separately calculated for men and women, considering a 5% significance level ( $p < 0.05$ ). Poisson regression was used to calculate the prevalence ratio. The usual and abusive consumption trend was separately assessed for each gender by the Poisson regression, considering the consumption pattern as a dependent variable and the year of study as an explanatory variable.

## RESULTS

The prevalence for tobacco use among bruxer and non-bruxer in male and female is shown in Figures 2 and 3. The results for distribution by gender of the alcohol consumption among bruxism and non-bruxism groups are shown in Figures 4 and 5.

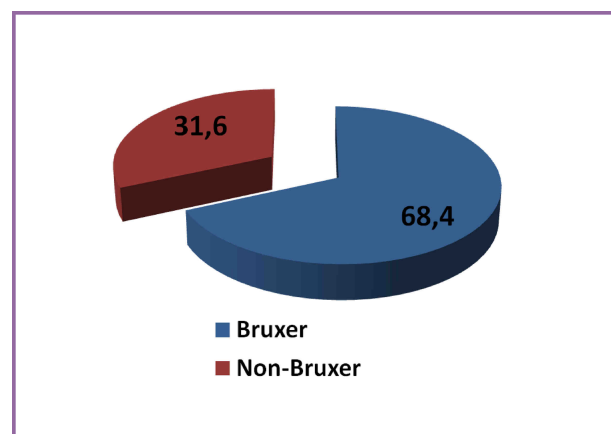


FIGURE 2 – Prevalence for tobacco use – male gender

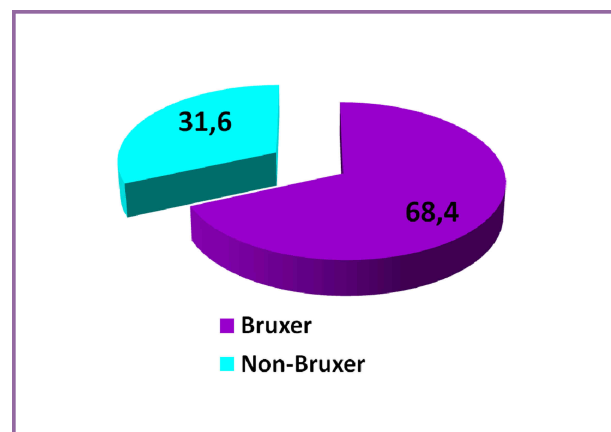


FIGURE 3 – Prevalence for tobacco use – female gender

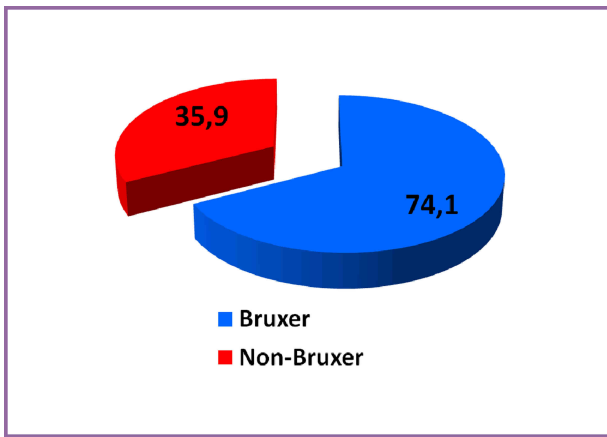


FIGURE 4 – Prevalence for alcohol consumption male gender

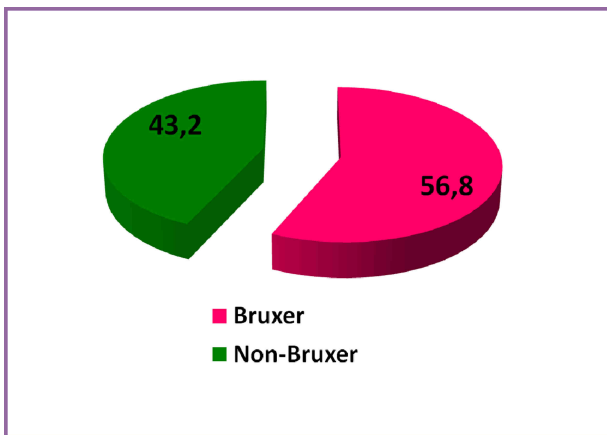


FIGURE 5 – Prevalence for alcohol consumption female gender

## DISCUSSION

Prevalence rates for bruxer and non bruxer, respectively, were as follows: having daily smoked at least 1 complete cigarette: 27.0% and 13.3%. Over the hand, bruxism was more frequent among cigarette smokers both in men (68.4%) and in women (56.8%). Among all respondents in bruxer group, 82.6% reported that they would like to quit smoking and those who have tried previously to quit (76.4%) found it made them more stressed. Drinker was more frequent in the group with bruxism also (66.5% of the female and 73.5% of the male). 88.4% reported drinking alcohol because it “allows dealing with stress in an adequate way”. In Brazil 28% of the adult population as heavy drinkers<sup>12</sup>. The frequency of usual consumption in Brazil is approxi-mately 31% lower than in the United States. Only a few Brazilian population studies with adults about alcohol consumption patterns have been published, which limits the comparison of prevalent consumption patterns with this study, especially regarding the development of indicators. Most<sup>13-15</sup> use the test recommended by WHO<sup>18</sup> to identify problems related to alcohol consumption (Alcohol use disorders identification test – AUDIT) that analyzes not only the

frequency of consumption and dose, but also the lack of control over consumption, lack of commitment, oblivion, regret, concern by other people and involvement with violence and accidents<sup>16</sup>. This test was validated in many countries, including Brazil<sup>14,17</sup>

Other Brazilian studies conducted with adults showed higher frequencies of alcohol consumption for men than for women, like the state of São Paulo in 1999, with 2,411 people aged from 12 to 65 years<sup>13</sup>, Rio Grande (RS), in 2000, with 1,260 people aged 15 years or older<sup>14</sup>, Salvador (BA), in 2001, that investigated 2,302 adults aged 25 years or more<sup>18</sup>, Campinas (SP) in 2003, that assessed 515 individuals aged 14 years or more<sup>3</sup>.

Studies have large variation in study design, sample size, definition of smoking, assessment of bruxism, and control for covariates. A Swedish cross-sectional study among 50-year-old men and women, based on a questionnaire (n = 6,343) and clinical examinations (n = 941) for validating and qualifying responses, showed a significant association in a multivariate model (with many covariates) between self-reported bruxism and daily tobacco use (either cigarette smoking or smokeless tobacco<sup>5</sup>.

A 1-year follow-up study among Finnish 30- to 55-year-old workers in a media company (n = 211) revealed a significant association between tobacco use and bruxism<sup>2</sup>. Smokers reported bruxism 2.4 (95% CI 1.2–4.9) times more likely than nonsmokers. Bruxism was based on responses to baseline and follow-up surveys. All tobacco use (including cigars, pipe, and smokeless tobacco) was categorized as smok-ing.

The present study shows a positive association between bruxism and alcohol consumption and tobacco use.

## RESUMO

Diferentes fatores que afetam o sistema nervoso central são considerados de risco para o bruxismo. Universitários não são imunes ao bruxismo, consumo de álcool e uso de tabaco apesar de sua formação e responsabilidade social. Avaliou-se a associação entre bruxismo, consumo de álcool e tabaco entre graduandos de Odontologia. Foram voluntários 180 estudantes (17-29 anos) da Faculdade de Odontologia de Araçatuba/ UNESP, divididos entre aqueles com e sem bruxismo, com base em critérios clínicos validados realizados por quatro examinadores com luz natural e espátula de madeira. Bruxismo foi registrado nas seguintes categorias: sem facetas de desgaste; facetas no esmalte; facetas na dentina; facetas em metade da coroa e facetas em mais de 2/3 da coroa. Auto-questionário validado para o consumo de álcool e tabaco, com 29 perguntas foi respondido pelos dois grupos. Teste T e Exato de Fischer foram aplicados. Bruxismo foi mais freqüente entre tabagistas, tanto em homens (68,4%) como mulheres

(56,8%). Entre os indivíduos com bruxismo, 82,6% relataram que gostariam de parar de fumar e aqueles que anteriormente tentaram (76,4%) sentiram-se mais estressados ao parar. O consumo de álcool também foi mais freqüente no grupo com bruxismo (66,5% no gênero feminino e 73,5% no masculino). 88,4% relataram consumir álcool "para lidar com o estresse de forma adequada". Resultados sugerem associação positiva entre bruxismo, consumo de álcool e tabagismo.

**UNITERMOS:** Sistema estomatognático, Tabagismo, Alcoolismo.

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