PREVALENCE OF SELF-REPORTED AWAKE AND SLEEP BRUXISM AMONG DENTAL STUDENTS

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Palavras-chave: Bruxismo. Epidemiologia. Sono. Estudantes de Odontologia.

RESUMO

Objetivo: Avaliar a prevalência de bruxismo em vigília e do sono e sua associação com características do sono em estudantes de odontologia. **Métodos**: Ao todo 153 estudantes de uma Faculdade de Odontologia brasileira foram convidados a participar desse estudo transversal, respondendo a um questionário avaliando sexo, idade, endereço, realização de trabalho remunerado e/ou trabalho noturno remunerado, horas de sono por noite, tempo para adormecer, qualidade do sono, sono agitado e a presença de um colega de quarto. A ingestão de bebida energética e pílulas para dormir, o histórico de acordar durante a noite, acordar sentindo-se cansado e dificuldades de concentração nas atividades diárias também foram avaliadas. O diagnóstico de bruxismo baseou-se no auto-relato. Foi realizada a análise descritiva e teste qui-quadrado. **Resultados**: A média de idade dos participantes foi de 21 anos (±3,25) e 73% eram do sexo feminino. A prevalência do bruxismo em vigília foi de 36,8% e bruxismo do sono foi de 11,3%. A maioria dos participantes, 57,2%, classificou a qualidade do sono como boa, porém 52,6% relataram que acordavam cansados. O uso de medicamento para dormir nos últimos 30 dias (P=0.002), acordar durante a noite e demorar mais de uma hora para dormir novamente nos últimos 30 dias (P=0.005) e acordar sentindo-se cansado (P=0.012) foram fatores associados ao bruxismo em vigília auto-relatado. **Conclusão**: A prevalência de bruxismo em vigília foi maior que a prevalência do bruxismo do sono em estudantes de odontologia. O uso de medicamento para dormir, acordar durante a noite e demorar mais de uma hora para dormir e acordar sentindo-se cansado podem ser fatores indicadores da presença de bruxismo em vigília em estudantes de odontologia.

Key-words: Bruxism. Epidemiology. Sleep. Dental Students.

ABSTRACT

Objective: To evaluate the prevalence of self-reported awake and sleep bruxism and its association to sleep characteristics among dental students. **Methods**: A cross-sectional study was conducted with 153 students of a Brazilian Dental School. Students who accepted to participate answered a questionnaire evaluating their sex, age, place of living, paid work, nocturnal paid work, hours of sleep per night, time to fall asleep, sleep quality, if participant had a bedroom partner, if participant is quiet on bed while sleeping and intake of sleep medication. Information on intake of energy drink, if participant wake up overnight, if participant wake up tired and it has been difficult to concentrate on daily activities was also collected. Awake and sleep bruxism was based on self-report. Descriptive analysis and chi-square test were carried out. **Results:** Most students were female (73%) and mean age was 21 years old (±3.25). The prevalence of self-reported awake and sleep bruxism was 36.5% and 11.3%, respectively. Most participants rated their sleep quality as good (57.2%) and reported that they woke up feeling tired (52.6%). Intake of sleep medication in the last 30 days (P=0.002), waking up overnight and taking over an hour to sleep again in the last 30 days (P=0.005) and waking up feeling tired (p=0.012) were associated factors to self-reported awake bruxism. **Conclusion:** The prevalence of self-reported awake bruxism was higher than the prevalence of sleep bruxism among dental students. Intake of sleep medication, waking up overnight and taking over an hour to sleep again and waking up tired were can be indicators of the presence of awake bruxism in dental students.

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INTRODUCTION

The origin of the word bruxism is Greek (*brychen*), which means to crush[1]. The term *bruxomanie* was first used by Marie Pietkewicz in 1907.[1] Ever since, it has been employed worldwide to describe the behavior of grinding and/or clenching of teeth.[1] Bruxism is the result of facial muscle contractions involving mandibular movements and unpleasant noises controlled by the central nervous system.[2,3] It can affect children and adults.[3] There has been much divergence in the scientific literature regarding the prevalence of

bruxism and differences concerning sex and age have not been reported.[4]

According to the international consensus criteria, bruxism can be classified into three categories: possible (based on self-report and/or parent/guardian/third-party report); probable (based on reporting and oral clinical examination) and definite (based on reporting, oral clinical examination and polysomnography results).[2] The etiology of awake bruxism and sleep bruxism is multifactorial involving a strong association with emotional issues.[3,4]

Accumulation of routine duties creates stress and can adversely affect health.[5-7] Dental students not only have to focus on their daily tasks, but also contend with demanding academic workloads.[6] In general, they are exposed to many academic hardships, which influence their emotional behavior owing to stress-adaptation reactions.[7] Ultimately, stress can be associated with awake and sleep bruxism.[7] Therefore, the aim of this study was to assess the prevalence of self-reported awake bruxism and sleep bruxism among dental students of a Brazilian federal university.

MATERIALS AND METHODS

Participants, setting, recruitment period and eligibility criteria

The present study was carried out in Belo Horizonte, southeastern Brazil, at the Dental School of the Federal University of Minas Gerais. The Dentistry Program is a five-year accredited program leading to the degree of Bachelor of Dental Sciences. Students in the first, second and fifth years were recruited between March and June of 2016. Year one and year two were chosen because they represent the first contact of students with the university and clinical setting, respectively. In year five, individuals are at the end of the program and labor activities will take place shortly after. Those periods are supposed to be of great stress and anxiety for students.

Ethical issues

Students were invited to take part in this study. Those who accepted participating signed a statement of informed consent. Approval from the Institutional Ethics Committee on Human Research (protocol # 482/07) was obtained.

Data Collection

Participants answered a validated questionnaire used in a previous Brazilian study.[7] The questionnaire consisted of open-ended and closed-ended questions through which the following information was collected: sex, age, place of living, paid work (extracurricular activities), nocturnal paid work, number of hours of sleep per night, time to fall asleep, quality of sleep, if the participant sleeps with a bedroom partner, if participant is not quiet in bed while sleeping and intake of sleep medication. Information on the intake of energy drinks, if the participant wakes up overnight, if the participant wakes up tired and if it was difficult to concentrate during daily activities was also collected.

The diagnosis of awake and sleep bruxism was based on participants' self-report according to a consensus criterion.[2] For awake and sleep bruxism assessment, participants answered the following questions:[7]

1. In the last 30 days, did you grind your teeth whilst awake?
2. In the last 30 days, did anyone tell you that you grind your teeth during sleep?

The answers for both questions could be "yes" or "no". Awake bruxism was confirmed if individuals answered "yes" for the first question and sleep bruxism was confirmed if individuals answered "yes" for the second question[7].

Pilot Study

A pilot study was conducted with 18 dental students six months prior to the development of the main study. Participants in the pilot study were not included in the main study. Methods were adequate and changes in data collection were unnecessary.

Data Analysis

The Statistical Package for the Social Sciences (SPSS, version 21.0; IBM, Chicago, USA) was used for data analysis. For this study, descriptive analyses and Chi-square test, with a 5% significance level, were carried out.

RESULTS

Among the 180 students in the first, second and fifth years, 153 answered the questionnaires (response rate: 85%). Fifty-one were in the first year, 59 in the second and 42 in the fifth year. The mean age of the participants was as follows: first year - 19 years (±1.37), second year - 21 years (±3.96) and fifth year - 23 years (±1.59). Participants' overall mean age was 21 years (±3.25). Most dental students were female (73%) and lived with their parents (59.8%). The prevalence of self-reported awake bruxism was 36.8% and the prevalence of self-reported sleep bruxism was 11.3% (Table 1).

A high percentage of dental students had no partner in their bedroom during sleeping (78.3%). Most participants reported that they sleep between 6-8 hours per night (84.9%). Forty-five percent of participants took between 10-20 minutes to fall asleep and 57.2% rated their sleep quality as good. However, 52.6% reported that they woke up feeling tired and 51.3% stated that it was difficult to concentrate on daily activities. The intake of sleep medication was reported by 5.9%, and 10.5% reported that they had used energy drinks and/or pills to stay awake at least once within the last 30 days (Table 1).

***Table 1**: Descriptive analysis of the study variables among dental students.*

Variables	Number	%
Sex		
Female	111	73.0
Male	41	27.0
Place of living		
With parents	91	59.8
Without parents	61	40.2
Paid work (extracurricular activities)		
Yes	11	7.2
No	141	92.8
Nocturnal paid work (extracurricular activities)		
Yes	9	5.9
No	143	94.1
Self-reported Awake bruxism		
Yes	56	36.8
No	96	63.2
Self-reported Sleep bruxism		
Yes	17	11.3
No	134	88.7

Note: Not all dental students answered all the questions.

Bivariate analysis between independent variables and self-reported awake and sleep bruxism are presented in Table 3. The variables "intake of sleep medication in the last 30 days", "waking up overnight and taking over an hour to sleep again in the last 30 days" and "waking up tired" were associated to self-reported awake bruxism. No association between independent variables and self-reported sleep bruxism was observed.

DISCUSSION

The prevalence of self-reported awake bruxism found in the present study (36.8%) is similar to the prevalence of 36.5% reported by another Brazilian study with dental students.[7] However, the prevalence of self-reported sleep bruxism (11.3%) herein was quite different from the prevalence reported by the same Brazilian study (21.5%).[7] The prevalence of awake and sleep bruxism among university students is still unclear in the literature and it may vary between 17.9% and 31.8% for sleep bruxism and between 2.3% and 37.9% for awake bruxism[5,7,8] depending on the country where the study was conducted. This variability regarding awake and sleep bruxism prevalence may be related to the cultural differences and different instruments used for data collection. It seems that sleep and awake bruxism prevalence is higher among university students compared to the general population.[5] This higher prevalence

***Table 2**: Descriptive analysis of sleep characteristics and daily activities of dental students*

Variables	Number	%
Sleep hours per night		
0 – 5	18	11.8
6 – 8	129	84.9
9 – 10	5	3.3
Minutes it takes to fall asleep		
1 – 5	38	25.0
10 – 20	66	45.3
25 – 40	38	25.0
60 – 90	10	6.7
Quality of sleep		
Good	87	57.2
Bad	65	42.8
Sleep with a bedroom partner		
No	119	78.3
Yes	33	21.7
Not quiet on bed while sleeping		
Yes	84	55.3
No	68	44.7
Intake of sleep medication in the last 30 days		
Yes	9	5.9
No	143	94.1
Energy drinks and/or pills to stay awake at night at least once in the past 30 days		
Yes	16	10.5
No	136	89.5
Woke up overnight and took over an hour to sleep again in the last 30 days		
Yes	42	27.6
No	110	72.4
Wake up tired		
Yes	80	52.6
No	72	47.4
Difficulty concentrating on daily activities		
Yes	78	51.3
No	74	48.7

Note: Not all dental students answered all the questions.

***Table 3**: Bivariate analysis of the association between studied variables and self-reported sleep bruxism and self-reported awake bruxism*

Variables	Self-reported Sleep Bruxism			Self-reported Awake Bruxism		
	Yes	No	*P*	Yes	No	*P*
Sex						
Female	13 (76.5)	97 (72.4)	1.000[2]	42 (75.0)	69 (71.9)	0.709[1]
Male	04 (23.5)	37 (27.6)		14 (25.0)	27 (28.1)	
Paid work (extracurricular activities)						
Yes	02 (11.8)	09 (06.7)	0.358[2]	04 (07.1)	07 (07.3)	1.000[2]
No	15 (88.2)	125 (93.3)		52 (92.9)	89 (92.7)	
Nocturnal paid work (extracurricular activities)						
Yes	02 (11.8)	07 (05.2)	0.268[2]	04 (07.1)	05 (05.2)	0.726[2]
No	15 (88.2)	127 (94.8)		52 (92.9)	91 (94.8)	
Sleep hours per night						
0 – 5	01 (05.9)	15 (11.4)	0.834[2]	05 (09.1)	11 (11.6)	0.733[2]
6 – 8	16 (94.1)	112 (84.8)		49 (89.1)	80 (84.2)	
9 – 10	0 (0.0)	05 (03.8)		01 (01.8)	04 (04.2)	
Minutes it takes to fall asleep						
1 – 5	03 (17.6)	35 (26.1)	0.749[2]	09 (16.1)	29 (30.2)	0.056[2]
10 – 20	07 (41.2)	58 (43.3)		26 (46.4)	40 (41.7)	
25 – 40	06 (35.3)	32 (23.9)		14 (25.0)	24 (25.0)	
60 – 90	01 (05.9)	09 (06.7)		07 (12.5)	03 (03.1)	
Quality of sleep						
Good	10 (58.8)	76 (56.7)	1.000[1]	28 (50.0)	59 (61.5)	0.179[1]
Bad	07 (41.2)	58 (43.3)		28 (50.0)	37 (38.5)	
Sleep with a bedroom partner						
No	15 (88.2)	103 (76.9)	0.366[2]	46 (82.1)	73 (76.0)	0.421[1]
Yes	02 (11.8)	31 (23.1)		10 (17.9)	23 (24.0)	
Not quiet on bed while sleeping	10 (58.8)	74 (55.2)	0.803[1]	36 (64.3)	48 (50.0)	0.094[1]
Yes	07 (41.2)	60 (44.8)		20 (35.7)	48 (50.0)	
No						
Intake of sleep medication in the last 30 days	01 (05.9)	08 (06.0)	1.000[2]	08 (14.3)	01 (01.0)	**0.002**[2]
Yes	16 (94.1)	126 (94.0)		48 (85.7)	95 (99.0)	
No						
Energy drinks and/or pills to stay awake at night at least once in the past 30 days						
Yes	01 (05.9)	15 (11.2)	1.000[2]	06 (10.7)	10 (10.4)	1.000[1]
No	16 (94.1)	119 (88.8)		50 (89.3)	86 (89.6)	
Woke up overnight and took over an hour to sleep again in the last 30 days						
Yes	06 (35.3)	36 (26.9)	0.566[2]	23 (41.1)	19 (19.8)	**0.005**[1]
No	11 (64.7)	98 (73.1)		33 (58.9)	77 (80.2)	
Wake up tired						
Yes	12 (70.6)	68 (50.7)	0.196[1]	37 (66.1)	43 (44.8)	**0.012**[1]
No	05 (29.4)	66 (49.3)		19 (33.9)	53 (55.2)	
Difficulty concentrating on daily activities						
Yes	08 (47.1)	70 (52.2)	0.799[1]	32 (57.1)	46 (47.9)	0.314[1]
No	09 (52.9)	64 (47.8)		24 (42.9)	50 (52.1)	

might be related to the highest levels of anxiety and stress faced by university students.

Stress and anxiety levels among dental students have been evaluated in other studies.[9-11] A study in Saudi Arabia found a prevalence of 66.8% and 54.7% for anxiety and stress, respectively.[9] Factors such as students' sex, emotional intelligence and clinical workloads may have influenced anxiety levels presented by the students.[6,10] A longitudinal study with dental students from the University of Jordan found that psychological stress levels increased as dental students moved forward from the first to the fifth year.[11] However, just a few students recognized that they sought professional assistance for management of stress.[6] Although the present study did not measure anxiety and stress levels, future research assessing those variables and their relationship with awake and sleep bruxism should be encouraged.

In our study, only 5.9% of students reported the use of sleeping pills. Despite the small percentage, this variable was associated self-reported awake bruxism, as well as the report of awakening overnight, waiting long periods to go back to sleep and waking up tired. Most dental students rated their sleep quality as good, although they also complained of fatigue in the morning and reported difficulty in concentrating on daily activities. Poor sleep quality, very frequently reported by dental students in other studies,[7,12] may be associated with bruxism, symptoms of anxiety and stress as well as lower academic performance.[7,12,13] Academic tasks during the dental program exert heavy demands on students, affecting their anxiety and stress levels along with their sleep duration and quality, contributing to higher sleeping pill intake and consequently higher prevalence of awake bruxism. Sleep plays an important role in individuals' psychological health and health complaints,[14] and a link between sleep characteristics, stress and anxiety levels and awake bruxism may exist. Future research assessing this relationship on a deeper level is encouraged.

In the present study, the percentage of students using energy drinks and/or pills to stay awake (10.5%) was higher than the intake of sleeping pills. Such a percentage was very similar to the percentage found among Chinese high school adolescents (10.5%)[15] and less than the percentage reported by Canadian adolescents and young adults (15.6%).[16] An American study stated that accomplishment of academic tasks was not a justification for increased energy drink consumption.[17] In our study, the reasons for energy drink and/or pills intake to stay awake were not investigated and were not associated with self-reported awake and sleep bruxism. Nevertheless, such an evaluation should be carried out in future research.

A small percentage of students in this sample reported that they engaged in paid work or nocturnal paid work. Moreover, most students lived with their parents. Individuals who need to share academic and labor activities may be overloaded with daily tasks, increasing the chances of stress.[18] Culture may also be taken into account. In certain countries, such as Brazil, university students still depend on their parents for making a living. In other countries, however, young adults are more used to engage in labor activities while in university.[19]

The present study used students' self-report to diagnose sleep bruxism and awake bruxism. In the international consensus, bruxism diagnosis has been categorized as follows: possible (based on self-report and/or parent/guardian/third-party reporting); probable (based on reporting and oral clinical examination) and definite (based on reporting, oral clinical examination and polysomnography results).[2] It is important to acknowledge that polysomnography is the gold standard tool for sleep bruxism diagnosis. However, it is a high-cost exam, thereby being more appropriate for small sample studies[2]. Self-report, though, has usually been used in large epidemiological studies[5,7,20,21] as an alternative parameter for clinical exam and polysomnography recording.[2]

The present study has limitations that should be acknowledged. The first limitation regards to the convenience sample restricted to dental students from one institution. The second limitation is in terms of the diagnosis of bruxism based, solely, on self-report. Future studies with a larger sample, including individuals from more than one institution, using other diagnoses strategies and also analyzing stress and anxiety levels among dental students are encouraged to better understand awake and sleep bruxism in this population.

The present study concluded that the prevalence of self-reported awake and sleep bruxism among dental students was 36.8% and 11.3%, respectively. Intake of sleep medication over the past 30 days, waking up overnight and taking over an hour to sleep again in the last 30 days and waking up tired were factors associated with self-reported awake bruxism among dental students. Healthcare providers should be aware of this information.

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