

## Prevalence of bruxism and its related factors in Students at Birjand University of Medical Science in 2019

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### Abstract

**Background & Aims:** Bruxism, known as human oral parafunctional habit, can be performed consciously or unconsciously during the day and night. The aim of this study was to investigate the prevalence of bruxism and its related factors in students at Birjand University of Medical Sciences (Birjand, Iran) in 2019.

**Materials & Methods:** In this descriptive-analytical cross-sectional study, 659 students were selected. The instruments used were the Persian version of the Bruxism Questionnaire from the American Academy of Sleep Medicine and Emotional Stress Questionnaire Association and that of the Depression, Anxiety, and Stress Questionnaire (DASS-21). After collecting, all data were analyzed by the SPSS ( $p < 0.05$ ).

**Results:** In this study, 63% and 37% of students were female and male, respectively. The prevalence of bruxism in students was 31.1%. This value was significantly high in the students who had a history of bruxism in their family members ( $p < 0.05$ ). Also, there was a significant relationship of age and stress with bruxism ( $p < 0.05$ ), but relationship of gender, depression, and anxiety with bruxism was insignificant ( $p > 0.05$ ).

**Conclusion:** The factors associated with bruxism were stress, family history, and age. Hence, it is suggested to consider stress as one of the important risk factors in the development of bruxism. By controlling this problem, bruxism and its subsequent results can be controlled.

**Keywords:** Bruxism, Prevalence, Stress, Student

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### Introduction

Bruxism as an oral parafunctional habit could be classified into primary and secondary types. In primary

bruxism, there are no specific medical or psychological causes, but its secondary form could be caused by the use of drugs or due to psychological and neurological

diseases (1, 2). This habit occurs as a result of exerting a lot of forces on the occlusal surface of the opposite teeth, i.e. squeezing and nonfunctional grinding of the teeth together.

In youth age groups (18-29 years), the prevalence of bruxism was 13% (3), and in girls was about 8-40%. Also, the prevalence of bruxism in young people is about 13-31%. However, evidence has revealed bruxism prevalence of 8-31% in adults (4). Bruxism has multifactorial etiology along with psychological and genetic factors and the level of stress. Students tends to have an irregular sleep behavior that was characterized by delay in the beginning and ending of sleep (5). Estimating bruxism prevalence is difficult due to the number of studies that adopt different diagnostic strategies and investigate nonrepresentative samples. The presence of physical or psychological illnesses in the selected population could act as a confounding variable in assessing the prevalence of bruxism (6).

Stress and anxiety were considered as the most important risk factors for bruxism. In addition, studies have shown that people who had higher prevalence of bruxism had more stress during work and daily life. Also, the higher a person's stress score, the higher the bruxism index (7). The occurrence of bruxism in children with psychosocial problems was 40% more than other people. It has also reported that individuals with bruxism had night sweats, urination and sleep cheek biting in comparison to other people (8).

Of note, timely diagnosis of this destructive habit, investigation of the related factors, and awareness could prevent irreparable injuries such as wear of permanent teeth and temporomandibular disorders in the middle and old ages. The aim of this study was to identify the prevalence of bruxism and its related factors in students at Birjand University of Medical Sciences, Birjand, Iran.

## Materials & Methods

The current research was a cross-sectional descriptive-analytical study. Students from Birjand University of Medical Sciences were selected as study population in 2019. The only criterion for entering the study was the student's consent to complete a

electronically designed questionnaire, which questionnaire was distributed on WhatsApp in available groups. Incomplete questionnaires were not considered for further study.

To determine the sample size, the prevalence calculation was used with the statistical confidence level set at 95% ( $\alpha = 5\%$ ), margin of error set at 3.8%, prevalence of 31.8% (1), 10% was added to the sample as drop. Overall, 659 participants were regarded as significant sample of this population.

The tools used in this study included the Persian version of the Bruxism Questionnaire from the American Academy of Sleep Medicine and Emotional Stress Questionnaire (9) and the Persian version of the Depression, Anxiety, and Stress Questionnaire (DASS-21). The bruxism questionnaire had eight two-choice items. Based on the answers given, it was concluded that the person has bruxism or not. In this study, the diagnosis of bruxism was performed based on the criterion of the American Academy of Sleep Medicine, reporting tooth-grinding or clenching in combination with at least one of the following conditions: abnormal tooth wear, sounds associated with bruxism, and jaw muscle discomfort.

DASS-21 questionnaire has 21 items that evaluates each of the psychological construct (depression, anxiety, and stress) by seven different expressions. The DASS-21 scale was used in screening for anxiety and stress symptoms during a week. The scoring method was on the basis of a four-item Likert scale (never: zero, a little: 1, sometimes: 2, always: 3) and total scores, comprises 0-9 (normal), 10-13 (mild), 14-20 (moderate), 21-27 (severe), 28 and more (very severe). For the depression scale, the scores characterized were as follows: 0-7 (normal), 8-9 (mild), 10-14 (moderate), 15-19 (severe), 20 and more (very severe), and for the anxiety and stress scale, scores included 0-14 (normal), 15-18 (mild), 19-25 (moderate), 26-33 (severe), 34 and more (very severe). The validity of this questionnaire has been confirmed in similar studies (8, 9).

Statistical analyses of the data were performed with the software SPSS version 16.0. Initially, the variables were analyzed by descriptive statistics that provided

relative and absolute frequencies, means, and standard deviations. The Chi-square test was carried out to verify association between the categorical variables. The level of statistical significance was 5%.

## Results

The study population consisted of 659 students with a mean age of  $21.5 \pm 2.7$  years, ranging between 18 and 31 years. Among the population, 420 (63%) were female, and 239 were male (37%).

The majority of the participated students were from the medical (254, 38.5%) and dentistry (187, 28.37%) departments. Most of the participating students (339, 51.4%) were professional doctorates. Also, 240 (36.4%) and 80 (12.13%) students had bachelor and master degrees, respectively.

Of 659 students, 205 were diagnosed with bruxism. Therefore, the prevalence of bruxism was estimated as 31.1%. The prevalence of bruxism was 31.2% in females and 31% in males; therefore, there was no significant relationship between gender and bruxism ( $p = 0.952$ ). Also, 202 (30.7%) students reported a history

of bruxism in at least one of their family members (father, mother, and siblings). The results showed a statistically significant relationship between family history and students suffering from bruxism. ( $p = 0.01$ ).

The age distribution of the students showed that the majority (480, 72%) were in the age group of 18-22 years, 151 were in the age group of 23-28, and 28 cases were over 28 years old. The prevalence of bruxism in people over 28 years old (53.6%) was higher than other age groups; hence, there was a statistically significant association between age groups and bruxism ( $p = 0.03$ ). However, no statistically significant correlation was found between college and bruxism ( $p > 0.05$ ). The mean score of depression, anxiety, and stress of the studied students was  $9.42 \pm 8.47$ ,  $8.36 \pm 6.65$ , and  $14.19 \pm 8.83$ , respectively.

In terms of depression, the participants were divided into five groups: normal, mild, moderate, severe, and very severe; 56.6% were in the normal group, and 4.7% had very severe depression. The prevalence of bruxism was 30.3% in the normal group and 25.8% in the group with very severe depression (Figure 1).

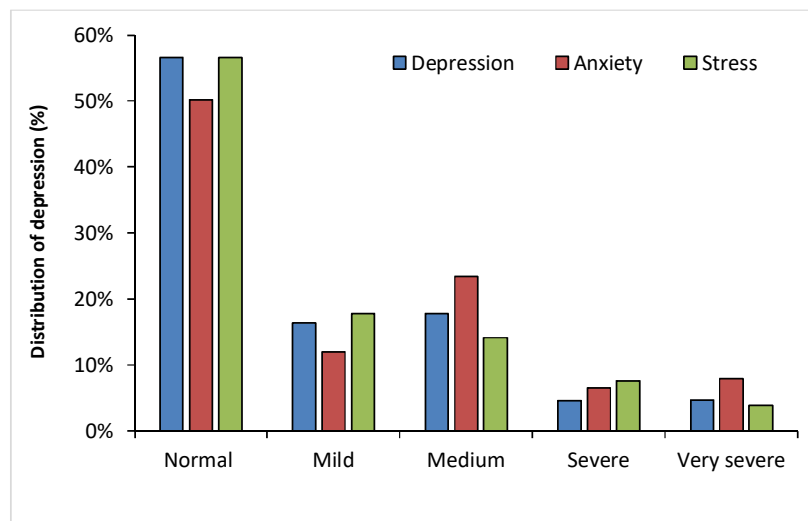


Fig. 1. Distribution of different levels of depression, anxiety and stress

The participants in the study were also divided into five groups in terms of anxiety; 50.2% were in the normal group, and 7.9% had very severe anxiety. The

prevalence of bruxism was 28.4% in the normal group and 46.2% in the group with very severe anxiety. There

was no statistically significant relationship between anxiety and bruxism ( $p = 0.066$ ).

The studied students were categorized into five groups in terms of stress; 56.6% were in the normal category, and 3.9% had very severe stress. The

prevalence of bruxism was 29% in normal group and 69.2% in group with severe stress. The results of chi-square test showed a statistically significant relationship between stress and bruxism ( $p = 0.01$ ; Table 3).

**Table 1.** Prevalence of bruxism based on demographic variables in the studied students

Variable			Bruxism		Total	<i>p</i> value*
			No	Yes		
Age group	18-22	N	337	143	480	0.03
		%	2/70	8/29	151	
	23-28	N	104	47	151	
		%	9/68	1/31	28	
	>28	N	13	15	28	
		%	46.4	53.6	100	
Family history	Yes	N	347	110	457	0.01
		%	76	24	100	
	No	N	107	95	202	
		%	53	47	100	
Sex	Female	N	289	131	420	0.95
		%	68.8	31.2	100	
	Male	N	165	74	239	
		%	69	31	100	
Grade	Bachelor's degree	N	189	51	240	0.082
		%	78.7	21.25	100	
	Master's degree	N	59	21	80	
		%	73.75	26.2	100	
	Professional doctorates	N	218	121	339	
		%	64.3	35.69	100	
College	Medical	N	190	64	254	0.074
		%	74.8	25.1	100	
	Dentistry	N	136	51	187	
		%	72.72	27.27	100	
	Nursing	N	63	19	82	
		%	76.82	23.17	100	
	Health	N	101	35	136	
		%	74.26	25.73	100	

\* Chi-square test

**Table 2.** Prevalence of bruxism based on depression in the studied students

Variable			Bruxism		Total	<i>p</i> value*
			No	Yes	373	
Depression	Little	N	260	113	100	0.72
		%	7/69	3/30	108	
	Mild	N	69	39	100	
		%	9/63	1/36	117	
	Medium	N	80	37	100	
		%	4/68	6/31	30	
	Serve	N	22	8	100	
		%	3/73	7/26	31	
	Very serve	N	23	8	100	
		%	2/74	8/25	373	

\*Chi-square test

**Table 3.** Prevalence of bruxism based on anxiety in the studied students

Variable			Bruxism		Total	<i>p</i> value*
			No	Yes		
Anxiety	Little	N	237	94	331	0.66
		%	6/71	4/28	100	
	Mild	N	51	28	79	
		%	6/64	4/35	100	
	Medium	N	111	43	154	
		%	1/72	9/27	100	
	Serve	N	27	16	43	
		%	8/62	2/37	100	
	Very serve	N	28	24	52	
		%	8/53	2/46	100	

\*Chi-square test

**Table 4.** Prevalence of bruxism based on stress in the studied students

Variable			Bruxism		Total	<i>p</i> value*
			No	Yes		
Stress	Little	N	265	108	373	0.01
		%	71	29	100	
	Mild	N	78	39	117	
		%	7/66	3/33	100	
	Medium	N	63	30	93	
		%	7/67	3/32	100	
	Serve	N	40	10	50	
		%	80	20	100	
	Very serve	N	8	18	26	
		%	8/30	2/69	100	

\*Chi-square test

## Discussion

Bruxism known as a diurnal or nocturnal parafunctional activity of the jaw muscles that includes the habit of tooth grinding, clenching, and squeezing, or touching of the teeth. (6, 10). In the literature, the prevalence of bruxism has been reported to be 8%-31.4% in adults (11) and 3.5%-40.6% in children (6, 12). The present study showed a prevalence of 31.1% for bruxism in students and indicates an association of bruxism with stress, family history, and age.

The prevalence of bruxism investigated in our study (31.1%) was lower than 50.25% and higher than 27.2% as reported by Carvalho *et al.* (13) and Mellis and Abou-Atme (14), respectively. Serra-Negra *et al.* (15) reported the prevalence of 21.5% of nocturnal bruxism self-reported by patients with an age similar to our participants. Differences in the bruxism prevalence between studies may be associated with various factors such as diagnostic criteria and indexes used, socioeconomic condition, cultural factors, geographical locations, and population characteristics (16).

A survey has shown that the prevalence of bruxism in students is higher than that of ordinary people (17). The higher bruxism prevalence in students could be due to the age requirements, academic pressures, and worries about the future of employment. It should be highlighted that there were contradictions in this matter. For instance, in a comparative study conducted among students, employees, and patients in Pakistan, it was observed that the prevalence of bruxism in these three groups was significantly different, and the prevalence of bruxism in students was lower than other groups (18).

Evidence has exhibited no significant difference in the prevalence of bruxism among students of different disciplines (5, 15). Also, we found no significant difference between the prevalence of bruxism and the level of education among the students. In this study, similar to a systematic study, there was no significant relationship between gender and bruxism (19). Also, in Japanese adolescents, the prevalence of sleep bruxism was estimated to be 3.3% among males and 3% among females using the questionnaire method (20). Contrary

to the results of our study, the prevalence of bruxism in females was significantly higher than that of males (21).

This study contradicted the claims of some researches who stated stress-related disorders were more common in women than in men. Molecular and systemic causes may be responsible for increased endocrine reactions, emotions, and stress response in women. It has been shown that women have more ability to cope with stress than men, by becoming less susceptible to the memory disrupting effects of elevated cortisol levels. In terms of psychological stress related to work, women had high stress and bruxism due to more unpaid work and more responsibility for household and family-related tasks.

Based on the findings of this study, there was a significant relationship between family history and bruxism. Two other studies conducted on children showed similar results (22, 23). It is interesting that no genetic inheritance pattern has yet been recorded for this disease. In the present study, the prevalence of bruxism increased significantly in older age groups, but contrary to the results obtained in a systematic study on the prevalence of bruxism in adults, it was not stated that increasing age was associated with a decrease in bruxism in the elderly (6). Also, another study has shown that the prevalence of bruxism reported by parents increased from the youngest group (2-4 years old; 18.5%) to the older group (5-7 years old; 27.4%) and decreased at the age of more than 8 years (20.2-17.3). There was also a specific peak at the age of 6; therefore, bruxism had an independent relationship with age.

In this study, no significant relationship was observed between depression and anxiety and bruxism. However, previous studies have attributed the elevated level of depression to the increase of bruxism (17, 22, 24). The association between teeth grinding and depression is still considered controversial because it has not been scientifically proven that depression could be the cause of teeth grinding. However, some studies have reported the frequent occurrence and greater severity of depression symptoms in patients with grinding teeth (25, 26). There is a common opinion

among researchers that patients with sleep bruxism have an anxious personality compared to normal people, but they do not have an anxiety disorder (27). In our study, relationship between stress and bruxism was significant. Another study has also reported the same result as ours and implied that methods for coping with stress affect bruxism (13).

Chronic stress and its body reactions caused muscle tension in the chewing muscles and pain. In addition, the body's responses to stress could in turn caused neuromuscular disorders. Also, people who tended to control and coerce behaviors were more prone to bruxism. Another study showed that bruxism and stress were high among college students compared to the general population (7). Although female students in that study had more stress, there was no relationship between stress and bruxism in this group, which was not consistent with the results of our study.

Our study had several limitations. This study was cross-sectional, and bruxism was assessed using a questionnaire and based on self-report. Moreover, the diagnosis was not confirmed by dental examination.

## Conclusion

The present research could provide a basis for future studies on bruxism and recommended treatments for this disorder. Screening people with severe disease and therapeutic interventions should be considered in order to acquire stress control skills. In addition, efforts should be made in the field of culture healthy sleep and mental health. Furthermore, students should be informed about the importance of bruxism.

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## Ethical considerations

The present study was approved by the Ethics Committee of Birjand University of Medical Sciences, Birjand, Iran (ethical code: IR.BUMS.REC.1399.224).

## Conflict of interest

No potential conflict of interest was reported by the authors.

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## Data availability

The raw data supporting the conclusions of this article are available from the authors upon reasonable request.

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