

Prevalence and Association of Bruxism and Emotional Stress among Male and Female Dental Undergraduate Students at AIMST University, Malaysia

Leneena Gudugunta¹, Bhavana Vankayala², Chen Jun Sen³, Cheah Jia Jie⁴, Chew Khai Yin⁵, Preetha Anand⁶

¹Faculty in Dentistry, Department of Conservative Dentistry and Endodontics, AIMST University, Malaysia.

²Assistant Professor, Department of Conservative Dentistry and Endodontics, Government Dental College and Hospital, Hyderabad, Telangana, India.

³UG Student, AIMST University, Malaysia.

⁴UG Student, AIMST University, Malaysia.

⁵UG Student, AIMST University, Malaysia.

⁶Faculty in Dentistry, Department of Oral Medicine and Radiology, AIMST University, Malaysia.

Corresponding Author: Bhavana Vankayala

ABSTRACT

This study aimed to assess the prevalence and association of Bruxism and emotional stress among dental undergraduate students at AIMST University, investigate the association between bruxism and emotional stress among dental undergraduate students at AIMST University, investigate the association between bruxism and year of study among dental undergraduate students at AIMST University, and investigate the prevalence of emotional stress among dental undergraduate students at AIMST University. A cross sectional study was conducted at AIMST University. Final sample included 104 undergraduate dental students. Bruxism was diagnosed by the presence of aligned dental wear facets associated with the presence of one of the following signs or symptoms: self-report of tooth-grinding, painful sensitivity of the masseter and temporal muscles, discomfort in the jaw musculature upon waking. The Stress Symptoms Inventory (SSI) was applied to evaluate emotional stress. AIMST BDS programme is a 5 year programme, year 2 and year 5 were being assumed as more stressful as year 2 is subjected to greater amount of theoretical examinations and year 5 students need to fulfil significant amount of clinical quota to complete the course. Results show prevalence of stress among dental students was

75% regardless of year of studies the student belonged to. Prevalence of bruxism in the 104 selected AIMST dental students was 27.9%. The Chi-square test indicated there is significant association between Bruxism and Emotional Stress.($P < 0.05$). No significant association between Bruxism and Gender($P = 0.069$) or between Bruxism and Year of Study, and no significant association between stress and year of study. Hence it can be concluded that emotional stress was associated with bruxism, independently of gender and the year of studies of dental undergraduate students of AIMST University.

Key words: Bruxism, Stress, wear facets.

INTRODUCTION

Bruxism can be defined as involuntary gnashing, grinding, or clenching of teeth. There are two main types of bruxism: one occurs during sleep (*nocturnal bruxism*) and one during wakefulness (*diurnal bruxism*). Dental damage may be similar in both types, but the symptoms of **sleep bruxism** tend to be worse on waking and improve during the course of the day, and the symptoms of **diurnal bruxism** may not be present at all on waking, and then worsen over the day. It is usually an

unconscious activity that results in abnormal wear patterns on the teeth, periodontal breakdown, and joint or neuromuscular problems. It is not a disease, but when exacerbated may lead to an imbalance of the stomatognathic system. Several therapeutic modalities have been suggested, but there is no consensus about the most efficient. [2]

The etiology of bruxism is controversial and it has still not been possible to establish a direct cause and effect relationship for setting off this parafunctional activity. Three main etiological factors are involved in bruxism: morphological, pathophysiological and psychological factors. Morphological factors are related to occlusion and articular disharmony; pathophysiological factors include smoking, alcohol and drugs.

The psychological factor is related to depression, anxiety and emotional stress, which play an important role in starting and perpetuating bruxism, as well as in its frequency, and severity. *Manfredini et al.* (2004) found an association with anxiety, and with depressive and manic symptoms in bruxers. It is also believed that depressed, anxious and emotionally stressed individuals present a greater predisposition for developing bruxism, mainly during sleep, as a response to releasing daily emotional stress. Conversely, other studies suggest that there is no relationship between sleep bruxism and stress, as reported by *Watanabe et al.* (2003) and *Pierce et al.* (1995). The aim of this study is to,

- (1) investigate the prevalence of bruxism among dental undergraduate students at Asia Institute of Medical, Science and Technology University (AIMST University).
- (2) investigate the association between bruxism and emotional stress among dental undergraduate students at AIMST University
- (3) investigate the association between bruxism and year of study among dental undergraduate students at AIMST University

- (4) investigate the association between emotional stress and year of study among dental undergraduate students at AIMST University

MATERIALS AND METHODS

A cross-sectional study was conducted. A total of 100 dental undergraduate students at AIMST University in which 20 dental undergraduate students among each batch for 5 batches were randomly selected according to inclusion criteria and went through clinical examination by trained researchers and have completed a questionnaire after signing a consent form, approved by the local ethical committee of AIMST University. Trained researchers then performed dental wear evaluation.

i. Psychological assessment

1. Actual presence or absence of stress was identified using a validated questionnaire, Stress Symptoms Inventory (SSI). [3]
2. The Stress Symptoms Inventory (SSI) was formed by three frames referring to the stages of stress. The first table, consisting of 15 items, referred to the physical or psychological symptoms that the person had experienced in the last 24 hours. The second, consisting of ten physical and five psychological symptoms, was related to the symptoms experienced in the last week. And the third table, composed of 12 physical and 11 psychological symptoms, referred to symptoms experienced in the last month. Some of the symptoms that appeared in Table 1 reappeared in Table 3, but with different intensity. In all, the SSI presented 37 items of a somatic nature and 19 psychological ones, the symptoms often repeated, differing only in their intensity and seriousness. Phase 3 was diagnosed based on the frequency of the items marked in the resistance phase.
3. Undergraduate students had to participate in all three of SSI session and

answer all the question. The score is calculated by:

1 point for each positive answer from each session

- A. Up to 3 for alert stage
- B. Up to 6 for resistance stage
- C. Up to 8 for exhaustion stage

Above stages in all A,B and C are considered to be stressed. [3]

ii. Clinical examination

The clinical examination was conducted by researchers under bright lightning with appropriate instruments to identify signs of bruxism.

Instruments:

- 1. mouth mirror
- 2. dental light; under clinical set up

Researchers recorded data on clinical card composed of data on

- 1. Field of studies
- 2. Number of teeth present
- 3. Smith and Knight Tooth Wear Index
- 4. Presence of discomfort in masticatory muscles upon waking
- 5. Report of tooth grinding in the last four weeks

Incisal edges(I) and occlusal surface(O) wear were recorded using ordinal scoring system by Smith et al in British Dental Journal. [4]

Score	Surface	Criterion
0	OI	No loss of enamel surface characteristics
1	OI	Loss of enamel surface characteristics
2	O I	Enamel loss just exposing dentine <1/3 of the surface Enamel loss just exposing dentine
3	O I	Enamel loss just exposing dentine >1/3 of the surface Enamel loss and substantial dental loss but no pulp exposure
4	O I	Complete enamel loss, or pulp exposure or 2 ^o dental exposure or 2 ^o dental exposure

Bruxism was diagnosed by

- 1. Presence of worn facets on anterior and/or posterior teeth during protrusion or lateral movements of mandible.
- 2. Presence of discomfort in masticatory muscles upon waking.

- 3. Report of tooth grinding/clenching while awake or during sleep in the last four weeks

Overall, the questionnaire used for this research elicited information on

- i. Demographic details of participants (gender, year of study)
- ii. Stress evaluation through SSI questionnaire
- iii. Number of teeth present
- iv. Number of incisal edges and occlusal surface wear recorded using Smith and Knight Tooth Wear Index
- v. Experienced discomfort in masticatory muscles upon waking
- vi. Experience of tooth grinding/ clenching while awake or during sleep in the last 4 weeks.

To be identified as a bruxer, the sample must be presented with dental wear and habit of clenching and grinding teeth while awake or during sleep, as noted by his/her bed partner or roommate. Prevalence of bruxism among dental undergraduate students at AIMST University as well as the comparison made of the prevalence of stress in subjects with or without bruxism will be analyzed by using Pearson Chi-Square Test.

RESULTS

The prevalence of bruxism in the 104 selected AIMST dental students was 27.9% (n=29). The presence of emotional stress was recorded in 75.0% (n=78) of them, and among the stressed students, 33.3% (n=26) reported grinding their teeth while asleep and/or awake.

Significant association (P=0.032) was found between the presence of emotional stress and bruxism among AIMST dental students. No significant difference (P=0.162) was found for the association between stress and year of study. There was also no significant difference (P=0.734) in the association between bruxism and year of study.

Furthermore, there was no significant difference (P=0.069) in the

association between gender and bruxism, as (P=0.634).
 well as between gender and emotional stress

Table 1

Bruxer * Stress Crosstabulation			Stress		Total
			Absence	Presence	
Bruxer	non-bruxer	Count	23	52	75
		Expected Count	18.8	56.3	75.0
		% within Bruxer	30.7%	69.3%	100.0%
		% within Stress	88.5%	66.7%	72.1%
		% of Total	22.1%	50.0%	72.1%
	bruxer	Count	3	26	29
		Expected Count	7.3	21.8	29.0
		% within Bruxer	10.3%	89.7%	100.0%
		% within Stress	11.5%	33.3%	27.9%
		% of Total	2.9%	25.0%	27.9%
Total		Count	26	78	104
		Expected Count	26.0	78.0	104.0
		% within Bruxer	25.0%	75.0%	100.0%
		% within Stress	100.0%	100.0%	100.0%
		% of Total	25.0%	75.0%	100.0%

Table 1 shows the association among dental undergraduate students at AIMST University between Bruxism and Emotional Stress

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.606 ^a	1	.032		
Continuity Correction ^b	3.586	1	.058		
Likelihood Ratio	5.214	1	.022		
Fisher's Exact Test				.042	.025
Linear-by-Linear Association	4.562	1	.033		
N of Valid Cases	104				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.25.
 b. Computed only for a 2x2 table

Chi-Square Test value is 4.606.

No cell has expected count less than 5.

Degree of freedom = 1

P value is 0.032.

As P < 0.05, null hypothesis is not accepted. There is significant association between Bruxism and Emotional Stress.

Table 2

Stress * Year Crosstabulation			Year					Total
			Year 1	Year 2	Year 3	Year 4	Year 5	
Stress	Absence	Count	7	7	7	3	2	26
		Expected Count	5.3	5.3	5.0	5.5	5.0	26.0
		% within Stress	26.9%	26.9%	26.9%	11.5%	7.7%	100.0%
		% within Year	33.3%	33.3%	35.0%	13.6%	10.0%	25.0%
		% of Total	6.7%	6.7%	6.7%	2.9%	1.9%	25.0%
	Presence	Count	14	14	13	19	18	78
		Expected Count	15.8	15.8	15.0	16.5	15.0	78.0
		% within Stress	17.9%	17.9%	16.7%	24.4%	23.1%	100.0%
		% within Year	66.7%	66.7%	65.0%	86.4%	90.0%	75.0%
		% of Total	13.5%	13.5%	12.5%	18.3%	17.3%	75.0%
Total		Count	21	21	20	22	20	104
		Expected Count	21.0	21.0	20.0	22.0	20.0	104.0
		% within Stress	20.2%	20.2%	19.2%	21.2%	19.2%	100.0%
		% within Year	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	20.2%	20.2%	19.2%	21.2%	19.2%	100.0%

Table 2 shows the association Study among dental undergraduate students between Emotional Stress and Year of at AIMST University.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.537 ^a	4	.162
Likelihood Ratio	7.072	4	.132
Linear-by-Linear Association	4.825	1	.028
N of Valid Cases	104		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.00.

Chi-Square Test value is 6.537. No cell has expected count less than 5.

Degree of freedom = 4, P value is 0.162. As $P > 0.05$, null hypothesis is accepted. There is no association between Emotional Stress and Year of Study.

Table 3

Bruxer * Year Crosstabulation								
			Year					Total
			Year 1	Year 2	Year 3	Year 4	Year 5	
Bruxer	non-bruxer	Count	15	16	15	17	12	75
		Expected Count	15.1	15.1	14.4	15.9	14.4	75.0
		% within Bruxer	20.0%	21.3%	20.0%	22.7%	16.0%	100.0%
		% within Year	71.4%	76.2%	75.0%	77.3%	60.0%	72.1%
		% of Total	14.4%	15.4%	14.4%	16.3%	11.5%	72.1%
	bruxer	Count	6	5	5	5	8	29
		Expected Count	5.9	5.9	5.6	6.1	5.6	29.0
		% within Bruxer	20.7%	17.2%	17.2%	17.2%	27.6%	100.0%
		% within Year	28.6%	23.8%	25.0%	22.7%	40.0%	27.9%
		% of Total	5.8%	4.8%	4.8%	4.8%	7.7%	27.9%
Total	Count	21	21	20	22	20	104	
	Expected Count	21.0	21.0	20.0	22.0	20.0	104.0	
	% within Bruxer	20.2%	20.2%	19.2%	21.2%	19.2%	100.0%	
	% within Year	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	20.2%	20.2%	19.2%	21.2%	19.2%	100.0%	

Table 3 shows the association between Bruxism and Year of Study among dental undergraduate students at AIMST University.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.012 ^a	4	.734
Likelihood Ratio	1.931	4	.748
Linear-by-Linear Association	.436	1	.509
N of Valid Cases	104		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.58.

Chi-Square Test value is 2.012.

No cell has expected count less than 5.

Degree of freedom = 4

P value is 0.734.

As $P > 0.05$, null hypothesis is accepted. There is no association between Bruxism and Year of Study.

DISCUSSION

This study was attempted to access the relationship between general bruxism behaviour and emotional stress by evaluating a specific population composed of dental students from different year of study.

There was a generalized assumption among AIMST dental students saying that year 2 and year 5 students were subjected to most stress. This was because year 2 dental

students had multiple theory examinations. Year 5 students have to finish their clinical quotas to graduate successfully. These reasons lead to high level of stress accumulated in dental students. Based on this study, we could find out whether those statements were true or not.

In the present study, it was found that among 104 dental students that participate in the research, 78 experienced emotional stress. This showed that prevalence of stress among dental students was 75% regardless of year of studies the student belonged to. Among the students with emotional stress, they were being categorized further into alert stage, resistance stage and exhaustion stage.

From Table 2, most amount of student experienced stress (in descending order) can be seen in year 5 (18/20 or 90%), followed by year 4 (19 out of 22 or 86.36%), year 1 (14/21 or 66.67%) and year 2 (14/21 or 66.67%), lastly year 3 (13/20 or 65%). However, from the result that we have obtained in statistical analysis, there were no association between emotional stress and year of study ($P > 0.05$). This proved that the amount of stress perceived

by student was irrespective of their year of study. Hence, that amount of stress perceived by students might be based on their individual perceptions, and probably their attitude when dealing with different situations which were unrelated to their year of study.

The prevalence association between emotional stress in dental students and bruxism was statistically significant ($P = 0.032$). From the results tabulated in Table 1, the prevalence of bruxism in the 104 selected AIMST dental students was 27.9%. The presence of emotional stress was recorded in 75.0% of them, and among the stressed students, 33.3% reported grinding their teeth while asleep and/or awake. It was also found that among the non-bruxer dental students, 69.33% reported with emotional stress.

A study carried out by Carvalho ALA and colleagues^[5] from the department of Prosthodontics and Periodontology at Piracicaba Dental School, Brazil showed a prevalence of bruxism of 50.2% and a prevalence of emotional stress of 45.7% in Brazilian police officers. Significantly association between emotional stress and bruxism was found, irrespective of the type of work done by police officer.

From Table 3, it was proved that there was no association between bruxism and year of study. Since Table 1 proved that bruxism and emotional stress were having cause-and-effect relationship, the statistically insignificance between emotional stress and year of study resulted in statistically insignificance between bruxism and year of study.

A similar result was observed by Afridi YM^[6] (2008), who found that final year undergraduate students at Margalla Institute of Health Sciences has higher prevalence of emotional stress level and stress-related bruxism. Although their methodology of stress assessment tool was different with our study and dental examination was not conducted in the students for diagnosis of bruxism, their results showed strong correlation between

stress and bruxism. The Perceived Stress Scale (PSS) was used as stress evaluation questionnaire in their studies. It was also found that the students there were prone to stress because they face challenges being away from home, maintaining academic record and economic crisis in Pakistan.

The psychoemotional component was indicated as an important etiological factor for the occurrence of bruxism.^{[8][9][10]} The main elements that belong to it were the severity of stress and anxiety.^[8] Apparently, stress played a role not only in dental anxiety and gagging but also in sleep and awake bruxism.^[11] Patients who reported bruxism claimed to have higher levels of emotional stress than non-bruxing subjects. This confirmed former studies which showed that stress and personality traits contributed to the aetiology of bruxism.^{[10][12][13]} The exact contribution of these factors to the phenomenon of bruxism was, however, still unclear, and the literature presents contradictory reports.^{[7][14][15]}

CONCLUSION

Considering the sample utilized and the methodology used in this study, emotional stress was associated with bruxism, independently of the year of studies of dental undergraduate students of AIMST University. Therefore, the emotional stress of AIMST dental students should be treated prior to reduce the prevalence of bruxism. Caution is recommended when judging the present findings, because bruxism was diagnosed by questionnaire and physical examination and not by polysomnography. Therefore, the subject of the influence of the stress level on the occurrence of bruxism should be further explored.

REFERENCES

1. Andréa Lúcia de Almeida Carvalho, Altair Antoninha Del Bel Cury, Renata Cunha Matheus Rodrigues Garcia. Prevalence of bruxism and emotional stress and the association between them in Brazilian police officers. *Braz Oral Res* 2008; 22(1):31-5

2. Tan EK, Jankovic J. Treating severe bruxism with botulinum toxin. *J Am Dent Assoc.* 2000;131(2):211–216.
3. Lipp MEN, Guevara AJH. Empiric validation of stress symptoms inventory (SSI). *Estud Psicol.* 1994;11:43-9.
4. Pigno MA, Hatch JP, Rodrigues Garcia RC, Sakai S, Rugh JD. Severity, distribution, and correlates of occlusal tooth wear in a sample of Mexican-American and European-American adults. *Int J Prosthodont.* 2001;14(1):65-70.
5. Carvalho ALA, Del Bel Cury AA, Garcia RCMR. Prevalence of bruxism and emotional stress and the association between them in Brazilian police officers. *Braz Oral Res* 2008; 22 (1): 31-5.
6. Afridi Yamna Matin. Correlation between Perceived Stress and Bruxism in Students. *Dentistry* 2018, 8:9.
7. Pierce CJ, Chrisman K, Bennett ME, Close JM. Stress, anticipatory stress, and psychologic measures related to sleep bruxism. *J Orofac Pain.* 1995;9(1):51-6.
8. Lobbezoo, F.; Ahlberg, J.; Glaros, A.G.; Kato, T.; Koyano, K.; Lavigne, G.J.; de Leeuw, R.; Manfredini, D.; Svensson, P.; Winocur, E. Bruxism defined and graded: An international consensus. *J. Oral Rehabil.* 2013, 40, 2–4.
9. Manfredini, D.; Serra-Negra, J.; Carboncini, F.; Lobbezoo, F. Current Concepts of Bruxism. *Int. J. Prosthodont.* 2017, 30, 437–438.
10. De Leeuw, L.R.; Klasser, G.D. Orofacial Pain. In *Guidelines for Assessment, Diagnosis, and Management*, 5th ed.; Quintessence Publishing Co., Inc.: Chicago, IL, USA, 2013.
11. E. Winocur, N. Uziel, T. Lisha, C. Goldsmith, I. Eli. Self-reported Bruxism – association with perceived stress, motivation for control, dental anxiety and gagging. *Journal of Oral Rehabilitation.* 2010;87:1365-2842.
12. Fischer WF, O’toole ET. Personality characteristics of chronic bruxers. *Behav Med.* 1993;19:82–86.
13. Lobbezoo F, Naeije M. Bruxism is mainly regulated centrally, not peripherally. *J Oral Rehabil.* 2001;28:1085–1091.
14. Lavigne GJ, Khoury S, Abe S, Yamaguchi T, Raphael K. Bruxism physiology and pathology: an overview for clinicians. *J Oral Rehabil.* 2008;35:476–494.
15. Rompre ´ PH, Daigle-Landry D, Guitard F, Montplaisir JY, Lavigne GJ. Identification of a sleep bruxism subgroup with a higher risk of pain. *J Dent Res.* 2007;86:837–842.

How to cite this article: Gudugunta L, Vankayala B, Sen CJ et.al. Prevalence and association of bruxism and emotional stress among male and female dental undergraduate students at AIMST University, Malaysia. *International Journal of Research and Review.* 2020; 7(12): 210-216.
