

Association Between Stress and Parafunctional Habits Among Undergraduate Healthcare Students of Pakistan

Rabia Masood, Afifa Ehsan, Naila Umer, Simra Khan, Mahgul Asif, Sabaiyna Sohail

ABSTRACT:

Objective: Stress is a feeling of mental pressure and tension which leads to parafunctional habits increasing the risk of developing temporomandibular disorders. The purpose of this study was to assess the association between parafunctional habits as well as stress in undergraduate medical and dental students.

Study Design And Setting: This cross-sectional study was carried out from April 01, 2020, to October 31, 2021, amongst the students of different medical and dental colleges, both in the private and public sectors in Punjab, Sindh, and the Federal areas in Pakistan.

Methodology: The study comprised 466 students between 18 to 25 years. A self-compiled and validated questionnaire was shared with students belonging to various years of different medical and dental colleges. Response from all the forms was analyzed using SPSS Version 20 and the relationship between stress and parafunctional habits was assessed.

Results: Results indicated that the stress of studies was the most common stress among students (75.1%, n = 350) while the most common parafunctional habit was lip biting (30%, n = 140). The association between different types of stresses and parafunctional habits was seen to be significantly related to one another.

Conclusion: A significant relationship between parafunctional habits and stress was seen in undergraduate medical and dental students.

Keywords: Bruxism, dental students, habits, medical students, nail-biting, parafunctional habits, stress, temporomandibular joint disorders, thumb sucking.

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INTRODUCTION:

The word “stress” was made up by Hans Selye in 1936, who described it as “*the non-specific response of the body to any demand for change.*”. Hans Selye, also known as the father of stress observed that patients with different illnesses were found to be suffering from many similar symptoms that were commonly due to a stressful stimulus.¹ In psychological sciences, it is a feeling of mental pressure and tension. The predictable prevalence of emotional disruption seen in various studies on medical students is greater than that in the overall population.² Stress among healthcare students can be a substantial peril, ensuing corporeal or psychological illness, and can harm students’ performance as well as professional practice.³

Stress can also lead to insomnia which causes hyperarousal leading to an imbalance between sleep and wakefulness. Less sleep duration furthermore results in negative neurophysical functioning causing voluntary and involuntary parafunctional habits.⁴ It has also been reported that parafunctional habits such as bruxism are in response to emotional stress and are more commonly encountered in miserable, anxious individuals who are emotionally stressed. Stress has developed into a widespread phenomenon that has advanced extensively in recent years.⁴

Masticatory muscle movements can be natural or irregular and are characterized as functional (e.g., swallowing, chewing, and speaking) or parafunctional (e.g., tooth clenching, grinding, nail-biting, cheek biting, and various other oral habits).⁵ Parafunctional behaviors are commonly witnessed in the overall population and can bring about impairment of the dentition, masticatory system, and joints when they surpass the individual's physical and structural forbearance of the masticatory system.⁶ Parafunctional habits for instance bruxism and clenching of teeth may likewise intensify the possibility of resulting temporomandibular disorders.

Bruxism and clenching of teeth have occurrence equal to 90% of the overall population and are the most common parafunctional habits. The harmful results of parafunction bring about the collapse of vulnerable structures, which include the teeth, temporomandibular joint, periodontal tissues, and muscles. Whether normal or acute, bruxism and clenching of teeth can cause wear of teeth and can damage oral structures. It can also cause the collapse of periodontal tissues in the existence of muscular dysfunction, inflammation, and internal derangement. Consequently, a patient with such parafunctional habits can have tooth and joint pathology together.⁷

In addition to stress, parafunctional habits are also caused due to anxiety and depend on the personality type of the individual. Personality traits play an important role in an individual's ability to cope with different forms of stress such as those due to emotional reasons and others due as a consequence of depression.⁸ Undergraduate learning is a fragile phase in the life of a learner in which they deal with academic pressure and apprehension. Undergraduate learners need to manage the educational and social difficulties which they encounter during their professional careers.⁴ Therefore, it is imperative for undergraduate institutes to recognize the levels of stress among their students to present a stress-free learning environment to learners.⁴ The current study aims to evaluate the association between these parafunctional habits and stress in undergraduate medical and dental students.

METHODOLOGY:

This cross-sectional study was carried out between April 01, 2020, to October 31, 2021, amongst 466 students of 19 different medical and dental colleges in Punjab, Sindh, and the Federal areas in Pakistan. The sample of the study was calculated through the WHO sample size calculator taking the proportion of stress and depression among medical and dental students equal to 50%, confidence level equal to 95%, and margin of error equal to 5%.⁹⁻¹⁰ A random sampling technique was employed to collect the sample. Informed consent was sought from the research participants beforehand. A self-compiled and validated questionnaire was shared with the students belonging to various years of different medical and dental colleges, both in the private and public

sectors. The value of Cronbach's alpha achieved was 0.76. The questionnaire comprised various questions regarding types of stress encountered along with different parafunctional habits.

Participants were well-versed regarding the purpose of the research and informed consent was sought beforehand. The study was permitted by the Ethical Review Committee of Islamic International Dental College (IIDC), Riphah International University, Islamabad, Pakistan vide letter no IIDC/IRC/2020/003/009.

The inclusion criteria comprised of:

- Subjects from both sexes, male and female were considered.
- Subjects ranging from 18 to 25 years of age were incorporated.

The exclusion criteria comprised of:

- Subjects who previously had orthodontic treatment were excluded.
- Subjects whose age was less than 18 years and more than 25 years were also excluded from the research.
- Subjects who had fresh trauma to the head, neck, or jaw were also excluded.

The data obtained as a result of the questionnaire was statistically evaluated using Statistical Package for Social Sciences SPSS® software for Windows® version 20. Descriptive analysis was generated to calculate frequencies and percentages and the association between the variables of stress and parafunctional habits was studied using the help of the Chi-square test. The significance level was kept at $P = 0.05$.

RESULTS:

Out of the total 466 respondents from different medical and dental colleges, both in the private and public sectors 65.2% ($n = 304$) were females and 34.8% ($n = 162$) were males. The age limit included in the investigation was from 18 years to 25 years. The majority of the respondents (87.1%; $n = 406$) reported that stressful situations (e.g., during exams, viva, and patient interactions) make them feel anxious while the rest 12.9% ($n = 60$) stated that they don't feel nervous in such situations. The prevalence of different types of stress among the students is shown in Figure 1, highlighting stress of studies ($n = 350$; 75.1%) to be the most common stress among students followed by the stress of unclear concepts of the study material ($n = 333$; 71.5%), the stress of failing ($n = 313$; 67.2%) and meeting parents and teacher expectations ($n = 267$; 57.3%). A total of 385 respondents reported having some sort of parafunctional habits, among them most common was lip biting (30%; $n = 140$) followed by the clenching of teeth (13.3%; $n = 62$). Other parafunctional habits among the students were lip licking (11.4%; $n = 53$), nail biting (9%; $n = 42$), grinding of teeth (10.1%; $n = 47$), chewing of food on one side (4.7%; $n =$

22) and cheek biting (4.1%; n = 19). The association of parafunctional habits with gender was found to be insignificant (Table-1). A significant association was found between a few types of stress and parafunctional habits (Table-II). The stress of failure, future uncertainty, and stress of unemployment was found to be the most common reason resulting in maladaptive habits among the students. Lip biting, clenching, and grinding of teeth was commonly noted concerning this stress.

Figure 1: Prevalence Of Different Types Of Stress Amongst Medical and Dental Students

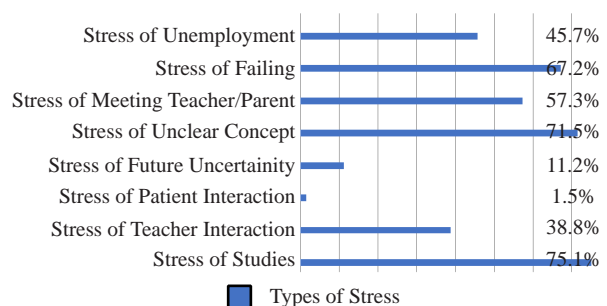
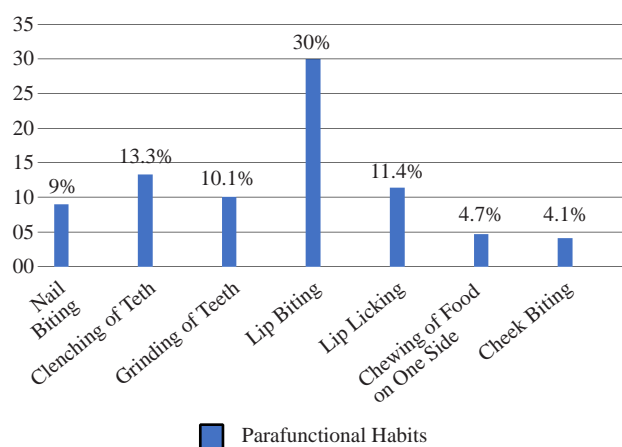


Figure 2: Prevalence Of Different Types Of Parafunctional Habits Among Medical and Dental Students



DISCUSSION:

Medical and dental school is often regarded as a demanding program. Fear and insecurity are rampant among the pupils, making their psychological and bodily health vulnerable. In this research, dental and medical students were recruited as study participants to accentuate the link between stress and parafunctional behaviors in undergraduate medical and dental students.⁴ Bruxism, clenching, grinding of teeth, lip licking, lip biting, nail-biting, thumb sucking, and other oral behaviors not related to mastication, swallowing, or speaking are all examples of oral parafunctional habits. Parafunctional potencies surpass customary masticatory forces, with the subsequent force vector being predominantly horizontal. Keeping in view such circumstances, impairment is prospective to transpire to the teeth and the periodontal tissues.⁴

In the current study, the association between stress and parafunctional habits was assessed and the incidence of parafunctional habits in students was documented. According to the results, 75.1% of the students reported stress from their studies, 71.5% reported stress from unclear concepts of the study material, and 67.2% reported stress from failing. Respondents who reported the previously mentioned stresses also reported parafunctional habits like clenching and grinding of teeth, and lip and cheek biting, thereby showing a positive association between stress and para-functional behaviors.

Studies conducted by Butt et al. found no significant relation between nail-biting, teeth grinding, and clenching while Paulino et al. reported that parafunctional habits, stress, and anxiety had a significant relationship with the development of temporomandibular disorders which are in agreement with the results of the present study.^{8,11} Various studies also reported a close association between females and parafunctional habits. Apprehension and dejection scores were found to be considerably greater in female participants. In the current study, 65.2% of the study participants were females and a majority of the respondents had stress which lead to the development of parafunctional habits progressing to temporomandibular disorders.^{11-14,16-17}

The most widespread parafunctional habit seen in the present

Table-1: Association Of Gender With Parafunctional Habits

GENDER (%ages within gender)	PARAFUNCTIONAL HABITS								P-value
	Nail Biting	Clenching Of Teeth	Grinding Of Teeth	Lip Biting	Lip Licking	Cheek Biting	Chewing Food On One Side	None Of Above	
Male	16 (9.9%)	25 (15.4%)	18 (11.1%)	36 (22.2%)	22 (13.6%)	9 (5.6%)	8 (4.9%)	28 (17.3%)	0.268
Female	26 (8.6%)	37 (12.2 %)	29 (9.5%)	104 (34.2%)	31 (10.2%)	10 (3.3%)	14 (4.6%)	53 (17.4%)	

P < 0.05 was considered a significant
 *P is significant at the 0.05 level
 Statistical analysis was performed by applying Chi-Square Test

Table-2: Association Of Stress With Different Parafunctional Habits

TYPES OF STRESS (%ages within stress)		PARAFUNCTIONAL HABITS								P-Value
		<i>Nail Biting</i>	<i>Clenching Of Teeth</i>	<i>Grinding Of Teeth</i>	<i>Lip Biting</i>	<i>Lip Licking</i>	<i>Cheek Biting</i>	<i>Chewing Food On One Side</i>	<i>None Of Above</i>	
<i>Stress Of Studies</i>	Yes	30 (8.6%)	50 (14.3%)	35 (10%)	100 (28.6%)	40 (11.4%)	15 (4.3%)	17 (4.9%)	63 (18%)	0.89
	No	12 (10.3%)	12 (10.3%)	12 (10.3%)	40 (34.5%)	13 (11.2%)	4 (3.4%)	5 (4.3%)	18 (15.5%)	
<i>Stress Of Teacher Interaction</i>	Yes	13 (7.2%)	27 (14.9%)	21 (11.6%)	58 (32%)	21 (11.6%)	11 (6.1%)	6 (3.3%)	24 (13.3%)	0.20
	No	29 (10.2%)	35 (12.3%)	26 (9.1%)	82 (28.8%)	32 (11.2%)	8 (2.8%)	16 (5.6%)	57 (20%)	
<i>Stress Of Future Uncertainty</i>	Yes	9 (17.3%)	0 (0%)	7 (13.5%)	19 (36.5%)	6 (11.5%)	1 (1.9%)	3 (5.8%)	7 (13.5%)	0.03*
	No	33 (8%)	62 (15%)	40 (9.7%)	121 (29.2%)	47 (11.4%)	18 (4.3%)	19 (4.6%)	74 (17.9%)	
<i>Stress Of Patient Interaction</i>	Yes	1 (14.3%)	2 (28.6%)	1 (14.3%)	1 (14.3%)	0 (0%)	0 (0%)	1 (14.3%)	1 (14.3%)	0.69
	No	41 (8.9%)	60 (13.1%)	46 (10%)	139 (30.3%)	53 (11.5%)	9 (4.1%)	21 (4.6%)	80 (17.4%)	
<i>Stress Of Unclear Concepts</i>	Yes	30 (9%)	43 (12.9%)	33 (9.9%)	99 (29.7%)	40 (12%)	13 (3.9%)	17 (5.1%)	58 (17.4%)	0.99
	No	12 (9%)	19 (14.3%)	14 (10.5%)	41 (30.8%)	13 (9.8%)	6 (4.5%)	5 (3.8%)	23 (17.3%)	
<i>Stress Of Meeting Parents/ Teacher Expectations</i>	Yes	21 (7.9%)	41 (15.4%)	31 (11.6%)	81 (30.3%)	33 (12.4%)	12 (4.5%)	12 (4.5%)	36 (13.5%)	0.15
	No	21 (10.6%)	21 (10.6%)	16 (8%)	59 (29.6%)	20 (10.1%)	7 (3.5%)	10 (5%)	45 (22.6%)	
<i>Stress Of Failure</i>	Yes	24 (7.7%)	51 (16.3%)	34 (10.9%)	93 (29.7%)	39 (12.5%)	12 (3.8%)	10 (3.2%)	50 (16%)	0.02*
	No	18 (11.8%)	11 (7.2%)	13 (8.5%)	47 (30.7%)	14 (9.2%)	7 (4.6%)	12 (7.8%)	31 (20.3%)	
<i>Stress Of Unemployment</i>	Yes	12 (5.6%)	36 (16.9%)	27 (12.7%)	69 (32.4%)	25 (11.7%)	8 (3.8%)	8 (3.8%)	28 (13.1%)	0.01*
	No	30 (11.9%)	26 (10.3%)	20 (7.9%)	71 (28.1%)	28 (11.1%)	11 (4.3%)	14 (5.5%)	53 (20.9%)	

P < 0.05 was considered a significant

*P is significant at the 0.05 level

Statistical analysis was performed by applying Chi-Square Test

study was lip biting in 30% of the students which was in agreement with the results of Malik et al. whereas other studies observed chewing gums as the most common one.^{16,18-19} Thumb sucking was found to be least prevalent which was in agreement with Malik et al. findings although the least prevailing parafunctional habit narrated by Butt et al. was chewing gums.^{8,16} Prevalence of temporomandibular disorders as a consequence of oral parafunctional habits was found to be higher in dental students as reported by different studies.¹³⁻¹⁵

The stress experienced by students had a significant association with clenching and grinding of teeth and a close relationship between bruxism and anxiety was also reported by Homeida et al.¹⁴ Bruxism is described as the clenching or grinding of teeth whether awake or sleeping. It's generally done unconsciously, and most individuals aren't aware of it.⁶ In an investigation conducted by Atsü et al. there was a positive association between nail-biting and temporomandibular disorders whereas the present study showed no significant association between stress and nail-biting in medical and dental students.⁶

Within the scope of this study, it was determined that there

is a positive association between stress and parafunctional habits like clenching and grinding of teeth, lip biting, pen/pencil chewing, cheek biting, and chewing of food on one side of the oral cavity as seen in other studies as well.²¹⁻
²² Treatment planning should take oral parafunctional habits, and anxiety into account simultaneously, and a multidisciplinary methodology combining dentists and psychologists should be appointed for prosperous treatment. Further studies should be conducted with much larger sample sizes including a larger number and a wider spectrum of participants from different hospitals in various areas of the country.

CONCLUSION:

Based on the current investigation we concluded that stress and parafunctional habits are closely associated with one another. There is an increase in parafunctional habits when students encounter stressful situations. The stress of studies is the most commonly encountered among medical and dental students followed by the stress of future uncertainty. Lip biting, clenching and grinding of teeth, and cheek biting are the most common parafunctional habits reported.

<p>Authors Contribution: Rabia Masood: Contributed to the conceptualization of the study and is responsible for the integrity of the study Afifa Ehsan: Helped in the acquisition, analysis, interpretation of data, and writing of the manuscript Naila Umer: Contributed to the initial write-up in the introduction and discussion part Simra Khan: Contributed to the initial write-up in the introduction and discussion part Mahgul Asif: Helped in the acquisition, analysis, interpretation of data, and writing of the manuscript Sabaiyna Sohail: Helped in the acquisition, analysis, interpretation of data, and writing of the manuscript</p>

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