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Original Article

Association between Parafunctional Habits and Temporomandibular Disorders among Sohag University Medical Students: A Cross-Sectional Study

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Abstract

Background: Parafunctional oral habits previously suspected to contribute in temporomandibular disorders (TMD). These habits such as clenching, grinding, gum chewing, and nail or lip biting may increase the load on the temporomandibular joint and aggravate symptoms.
Methods: A cross-sectional study was conducted among Sohag University medical students by using Fonseca's anamnestic index (FAI). A total of 1130 students completed the questionnaire. Participants were classified into no, mild, moderate, and severe TMD. The questionnaire also included questions about parafunctional habits. Chi-square test used to compare distribution of TMD categories across different habits.
Results: The mean age of participants was 22.82 ± 2.96 years; 54.3% were females. Overall, 66% had some degree of TMD. All studied parafunctional habits showed significant associations with higher TMD severity ($p < 0.001$). For example, students who reported clenching or grinding during sleep had higher percentages of moderate (40%) and severe TMD (10%) compared with those who denied the habit (moderate 12.3%, severe 1.7%). Similar results were observed with gum chewing, nail biting, lip biting, and object biting.
Conclusion: Parafunctional habits are strongly associated with increased prevalence and severity of TMD among medical students. Early identification and preventive strategies may help reduce the burden of TMD in young populations.

Keywords: Parafunctional habits, TMD, Prevalence, Severity, and Medical students
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Introduction

Temporomandibular disorders (TMD) represent a group of musculoskeletal conditions affecting the temporomandibular joint (TMJ), masticatory muscles, and associated structures. They are common in young adults and are considered one of the most frequent causes of orofacial pain. The multifactorial nature of TMD has been described in the literature, with behavioral and psychological factors contributing to its occurrence and progression.(1)

Parafunctional oral habits is considered as behavioral factors including clenching, grinding, gum chewing, nail biting, lip biting, and object biting. These habits considered to produce abnormal load on the TMJ and surrounding muscles, this may worsen clinical symptoms. Despite this, the strength of this association between parafunctional habits and TMD remains not confirmed, with reported variations among different population and studies.(2)

University students considered a unique category in which lifestyle and associated activities may affect the occurrence of parafunctional habits. Studying this population provides valuable information about early risk factors with production of preventive strategies.(3)

In our previous work, we reported a high prevalence of TMD among medical students at Sohag University. However, a detailed assessment of the role of parafunctional habits in relation to TMD severity has not been addressed.(4) The present study was therefore conducted to investigate the association between different parafunctional habits and the prevalence and severity of TMD in this cohort.

Methods

Study design and participants: This cross-sectional study was conducted among medical students at Sohag University between November 2022 and February 2024. The survey was distributed electronically through official student groups on social media platforms. Participation was optional, and students gave informed consent before completing the questionnaire. Ethical approval was obtained from the Ethics Committee of the Faculty of Medicine, Sohag University.

Questionnaire and variables: The questionnaire included demographic data and Fonseca's anamnestic index (FAI). Each item scored as 'no' (0 points), 'sometimes' (5 points), or 'yes' (10 points). The resulting total score was used to classify participants into no TMD (0–15), mild (20–40), moderate (45–65), and severe (70–100).

In addition, participants answered questions about parafunctional habits: clenching or grinding of teeth during sleep, clenching or grinding during study/work, gum chewing, nail biting, lip biting, and object biting (pens, pencils, etc.). Each habit was recorded using the same three responses (no, sometimes, yes).

Statistical analysis: Data were analyzed using SPSS version 28 (IBM Corp., Armonk, NY, USA). Age was expressed as mean ± SD, and categorical variables as frequencies and percentages. The chi-square test was applied to assess associations between TMD categories and each parafunctional habit. Statistical significance was set at $p < 0.05$.

Results

Participants: A total of 1130 medical students completed the questionnaire. The mean age was 22.82 ± 2.96 years. Of them 516 (45.7%) were males and 614 (54.3%) were females.

TMD prevalence and severity: According to FAI, 384 students (34%) had no TMD, 508 (45%) had mild TMD, 198 (17.5%) had moderate TMD, and 40 (3.5%) had severe TMD.

Association between parafunctional habits and TMD: All parafunctional habits were significantly associated with TMD categories ($p < 0.001$ for each). Students who reported clenching or grinding during sleep showed the highest percentage of moderate (40%) and severe TMD (10%) in comparison to those without this habit (moderate 12.3%, severe 1.7%). Similar patterns observed for clenching during study/work, gum chewing, nail biting, lip biting, and object biting (Table 1).

Table 1: Comparison of categories of TMD across parafunctional habits

Question	Answer		Categories of TMD				P-value
			No TMD	Mild TMD	Moderate TMD	Severe TMD	
Clenching or grinding during sleep	No	N	352	392	106	15	**<0.001**
		%	40.7%	45.3%	12.3%	1.7%	
	Sometimes	N	21	62	40	12	
		%	15.6%	45.9%	29.6%	8.9%	
	Yes	N	11	54	52	13	
		%	8.5%	41.5%	40.0%	10.0%	
Clenching or grinding during during work or studying	No	N	337	317	87	12	**<0.001**
		%	44.8%	42.1%	11.6%	1.6%	
	Sometimes	N	42	130	52	10	
		%	17.9%	55.6%	22.2%	4.3%	
	Yes	N	5	61	59	18	
		%	3.5%	42.7%	41.3%	12.6%	
Chewing gums	No	N	213	232	87	13	**<0.001**
		%	39.1%	42.6%	16.0%	2.4%	
	Sometimes	N	128	162	69	13	
		%	34.4%	43.5%	18.5%	3.5%	
	Yes	N	43	114	42	14	
		%	20.2%	53.5%	19.7%	6.6%	
Nail biting	No	N	273	330	112	21	**<0.001**
		%	37.1%	44.8%	15.2%	2.9%	
	Sometimes	N	56	84	34	4	
		%	31.5%	47.2%	19.1%	2.2%	
	Yes	N	55	94	52	15	
		%	25.5%	43.5%	24.1%	6.9%	
Objects biting or chewing	No	N	299	283	110	20	**<0.001**
		%	42.0%	39.7%	15.4%	2.8%	
	Sometimes	N	45	116	43	9	
		%	21.1%	54.5%	20.2%	4.2%	
	Yes	N	40	109	45	11	
		%	19.5%	53.2%	22.0%	5.4%	
Lip biting	No	N	200	172	62	13	**<0.001**
		%	44.7%	38.5%	13.9%	2.9%	
	Sometimes	N	117	166	62	16	
		%	32.4%	46.0%	17.2%	4.4%	
	Yes	N	67	170	74	11	
		%	20.8%	52.8%	23.0%	3.4%	

Discussion

The present study showed a strong association between studied parafunctional habits and TMD among Sohag University medical students, about two-thirds of the participants were classified as having some degree of TMD, and all the investigated parafunctional habits were found significantly related to higher severity of TMD levels.

Clenching and grinding during sleep or while studying showed high significant effect. Students reported clenching and grinding habits had considerably higher proportions of moderate and severe TMD compared with those without the habits. This finding is consistent with previous reports that highlighted nocturnal bruxism as a major contributing factor to temporomandibular joint overload and muscle fatigue.[5] Similarly, habits such as gum chewing, nail biting, lip biting, and object biting were found significantly linked to TMD severity. These results support the assumption that repetitive and prolonged loading of the TMJ through non-functional activities may predispose and aggravate joint dysfunction and pain. Comparable results were described in previous studies on university populations, which showed

that parafunctional habits could act as modifiable risk factors.[6]

Early recognition in this high prevalence of TMD in those relatively young and healthy population is very important since parafunctional habits are considered largely behavioral so targeted educational and preventive strategies considered effective in reducing its effect and subsequent TMD incidence.

The strengths of our study includes the large sample size and usage of validated screening tool. But limitations include that cross-sectional design cannot confirm causality between parafunctional habits and TMD. Future studies are required to confirm the causal role of parafunctional habits and address preventive interventions.

Conclusion

Parafunctional oral habits were significantly associated with the occurrence and severity of temporomandibular disorders among Sohag University medical student. Clenching, grinding, gum chewing, nail biting, lip biting, and object biting were all studied and linked to higher levels of TMD. As these described habits are potentially modifiable, early recognition and preventive behavioral educational programs may help reduce the risk and impact of TMD in young populations.

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