(International Print/Online Journal)

SJIF IMPACT FACTOR: 6.829
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 8, Issue 4 , Page No: 207-214
July-August 2025

IJMSCR

Association Between Temporomandibular Dysfunction and Stress Among Dental Students, Moradabad, UP

***Dr.Anjali Singh , [1]Dr.Ishika Padhan, [2]Dr.Ishita Garg, [3]Dr.Jasmine, [4]Dr.Jekuleena Baro, [5]Dr.Jubilee Kalita**

[1,2,3,4] BDS Intern,*Sr.Lecturer, Department of Public Health Dentistry
Kothiwal Dental College and Research Centre, Moradabad Uttar Pradesh

***Corresponding Author:**
Dr Anjali Singh
Sr.Lecturer, Department of Public Health Dentistry

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Background: Dental education is widely acknowledged as highly demanding, often leading to elevated stress levels among students. Chronic stress has both psychological and physical consequences, one of which is temporomandibular disorders (TMD), a group of musculoskeletal and neuromuscular conditions affecting the temporomandibular joint (TMJ) and associated structures. This study investigated the prevalence of TMD and its association with perceived stress among dental students.

Methods: A cross-sectional study was conducted among 386 undergraduate and postgraduate dental students at Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh. Participants completed two validated instruments: the Fonseca Anamnestic Index and the Perceived Stress Scale (PSS). Statistical analysis was performed using SPSS v19, with chi- square tests and Spearman correlation to evaluate associations. A p-value $\leq$ 0.05 was considered statistically significant.

Results: TMD was present in 49.4% of the participants. It was more prevalent in females (57.1%) than males (34.6%), with severe cases being rare (0.7%). A significant positive correlation was found between stress and TMD prevalence (r_s=0.43, $p<0.001$). Parafunctional habits such as teeth grinding were strongly associated with emotional distress. Postgraduate and female students reported higher levels of stress.

Conclusion: This study underscores a strong link between psychological stress and the development of TMD among dental students. The findings highlight the need for institutional interventions, including mental health support, stress management programs, ergonomic education, and routine screening for TMJ dysfunction. Addressing both the mental and physical health of students is essential to prevent long term consequences of stress related disorders.

Keywords: Temporomandibular disorder, Stress, Dental students, Fonseca Index, Perceived Stress Scale, Gender differences, Parafunctional habits

Introduction

Dental school is widely recognized as an academically rigorous and high-pressure environment, often contributing to significant levels of stress among students. The demanding nature of dental education, which combines extensive theoretical coursework with hands-on clinical training, can lead to heightened anxiety and emotional exhaustion. This dual pressure has been widely linked to elevated stress and mental health challenges among dental students.[1]

This persistent stress does not only affect their mental well-being but also has physical manifestations one of which is temporomandibular joint disorders[TMD]. Temporomandibular Joint Dysfunction refers to a

group of neuromuscular and musculoskeletal disorders characterized by issues in the structures surrounding the Temporomandibular Joint[TMJ], primarily affecting the muscles of mastication.[2] These disorders are commonly associated with restricted jaw movement, joint pain due to inflammation, and functional disturbances such as clicking, locking, or dislocation of the TMJ during activities like chewing or speaking and restricted mouth opening.[3]

Although early symptoms may be subtle or overlooked, psychological factors such as stress, anxiety, and oral parafunctional habits like bruxism and jaw clenching can significantly worsen the condition and play a key role in its progression to a chronic state.[3] Therefore, early identification of TMD allows for better control and potentially reduces its long-term effects.[2] Given that dental students often experience elevated stress due to academic pressures, clinical demands, and other factors, understanding the prevalence of TMD and its relationship with stress is crucial for implementing effective preventive and management strategies in dental education.[4] Therefore the present study aims to assess the prevalence and severity of temporomandibular disorders among dental students and evaluate the association with stress levels.

Objectives:

- To evaluate the prevalence of temporomandibular disorders among dental students.
- To evaluate the association between temporomandibular disorders and stress among dental students.

Methodology Study design

The present cross-sectional study was carried out among 386 undergraduate and postgraduate dental students across all academic years enrolled at Kothiwal Dental College and Research Centre (KDCRC), Moradabad, Uttar Pradesh, using non-probability convenience sampling method.

Sample Size

Based on previous study a sample of 386 was calculated, using Cochran's formula to provide 95% power, 5% margin of error and a significance level of p=<0.05.

Ethical Approval

The study protocol was approved by the Institutional Ethics Review Board (IERB) of Kothiwal

Dental College and Research Centre. Prior to the study all subjects signed an informed consent form. The study was conducted in full compliance with the 'International Guidelines of Human Research Protection' such as Declaration of Helsinki.

Eligibility Criteria

The study included undergraduate (BDS) and postgraduate (MDS) dental students enrolled at Kothiwal Dental College and Research Centre, Moradabad, who voluntarily agreed to participate by providing consent.

Participants were excluded if they had a prior history of surgical procedures involving the maxillofacial region, had experienced trauma affecting the maxillofacial area, were diagnosed with connective tissue disorders, had craniofacial anomalies, a history of trauma, or had undergone temporomandibular joint surgery.

Procedure

Two standardized and previously validated questionnaires were employed in this study. Participants were instructed to rate each item on the respective scales and select the responses that most accurately reflected their experiences. Adequate time was provided for the completion of the questionnaires, and all responses were thoroughly reviewed upon submission.

Measuring Tool

The first instrument used was the Fonseca Anamnestic Index, originally developed in Brazilian Portuguese by Fonseca[16], which screened and assessed the severity of Temporomandibular Disorders. The second tool was the Perceived Stress Scale (PSS), developed by S.Cohen[17] in 1983, which is widely recognized for measuring perceived levels of psychological stress.

The Perceived Stress Scale followed a five-point Likert scale ranging from "Never" to "Very Often" to assess the frequency of stress-related experiences. Before totalling the scores of PSS, the numbers for questions 4,5,7,8 were reversed in the following way; 0=4, 1=3, 2=2, 3=1, and 4=0. In contrast, the Fonseca Questionnaire used a three-point response format with options "No," "Sometimes," and "Yes" to evaluate the presence and frequency of TMD symptoms.

Volume 8, Issue 4; July-August 2025; Page No 207-214

Pretesting survey

The initial draft of the questionnaire was evaluated by professionals from the Department of Public Health Dentistry to assess its clarity, relevance, and effectiveness in eliciting the intended information. Subsequently, a pilot study was conducted with a sample of adults (n=10) to examine the questionnaire's comprehensibility and practical applicability. The internal reliability of the responses to the questions was assessed using Cronbach's alpha (α=0.86 and 0.84) and was found to be good.

Statistical analysis

Data entry was performed using Microsoft Excel 2019, and statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS), version 19. The Chi-square test was employed to find out association between temporomandibular dysfunction and stress among dental students. A p-value of ≤0.05 was considered statistically significant.

Result

This study assessed the association between stress and temporomandibular disorders in 386 dental students (256 females and 130 males), aged 17 to 32 years (mean=23.0 ± 2.8), with 75.6% undergraduates and 24.4% postgraduates.

Table 1 shows the distribution of TMD among study participants according to age and gender. A significant association was found between gender and TMD (p=0.0004). Among females, 146(57.1%) had mild to severe TMD symptoms, and 110(42.9%) had no TMD symptoms; among males, 45(34.6%) had TMD and 85(65.4%) had none. TMD prevalence did not differ significantly by age group (p=0.271), with approximately 49% affected in both groups, predominantly mild cases.

Table 2 shows the distribution of perceived stress levels among study participants by age and gender. There was a statistically significant association between gender and perceived stress levels (p=0.00005). Among females, 195(76.1%) reported moderate to high stress, compared to 71(54.6%) of males. Low stress was more common in males (45.4%) than in females (23.8%). The analysis of perceived stress across different age groups revealed no statistically significant association (p=0.070).

Tables 3 and 4 show the distribution of TMD and stress among study participants according to educational status. The analysis revealed no statistically significant association between the distribution of temporomandibular disorders and educational status (p=0.1797). A significant association was found between perceived stress and educational status (p=0.0472). Among undergraduate students, 204(69.8%) reported moderate to high stress, compared to 62(65.9%) of postgraduate students.

Table 5 illustrates the association between temporomandibular disorders and perceived stress levels, revealing a highly significant relationship (p=0.00001). Among those with high stress (n=49), 35(71.4%) participants reported moderate to severe TMD symptoms, and 14 participants reported no TMD symptoms. In the moderate stress group (n=216), 124(57.4%) participants reported mild to severe TMD symptoms. Among low stress participants (n=121), 32(26.4%) participants showed mild to severe TMD.

The Spearman correlation coefficient(rs) was found to be 0.43, indicating a moderate positive correlation between the variables.

Discussion

Temporomandibular disorders (TMD), as a multifactorial condition affecting the stomatognathic system, are influenced by a wide range of factors including psychological stress, parafunctional habits, occlusal abnormalities, trauma, poor posture, hormonal fluctuations, genetic predisposition, sleep disorders, systemic conditions.[5] The present study investigated the prevalence and severity of TMD among dental students and explored the link between stress and TMD symptoms.

A significant association between stress and TMD was observed in the present study among study participants, echoing patterns seen worldwide. Studies from Nepal[2], Pakistan[6], and India[5] supports this finding.

In this study, 50.5% of people said they had no signs of TMD. This result is likely influenced by the way the Fonseca Index works, it depends on people noticing and reporting their own symptoms. Mild or early signs of TMD can often go unnoticed, which may lead to more people being counted as having no TMD.[4] However, link between stress and TMD is complex, stress does not always cause pain right away or in

Volume 8, Issue 4; July-August 2025; Page No 207-214

obvious ways. These findings echo those of Rathod D et al.[5] in Udaipur likely due to similar sample sizes, suggesting a pattern. In contrast, there are different results from Chandak RM et al.[7] in Vidarbha population.

Remarkably, only 0.7% of participants showed signs of severe TMD, a surprisingly low figure likely influenced by the early symptom awareness and adaptive behaviors common among young, health-conscious dental students. These factors may mask underlying dysfunctions, leading to under recognition of severity. This trend aligns with global findings from India[7], Brazil[8],[9], Saudi Arabia[10], and Turkey[11], highlighting that while severe TMD appears rare, it remains a latent concern requiring continued vigilance and early intervention.

When examining gender differences, the data revealed that a notably larger proportion of male students (54.46%) were free from TMD symptoms compared to their female counterparts, among whom only 47.22% reported no signs of the disorder. This disparity is consistent with existing literature and may be explained by several interrelated factors, including hormonal influences particularly the role of estrogen in modulating pain sensitivity and joint function, greater prevalence of stress and anxiety in females, and psychosocial or behavioral factors such as higher rates of parafunctional habits. Furthermore, women generally exhibit a lower pain threshold and heightened pain sensitivity, which may contribute to increased symptom perception and reporting, making them more likely to report signs of TMD. Many studies around the world[6],[4],[10],[12] support this idea, showing that gender plays an important role, with women being more likely to experience TMD and often having more severe symptoms. The findings underscore the importance of considering gender-specific approaches in both the assessment and management of TMD.[13],[14]

The strikingly high number of participants (55.6%) who affirmed to "Do you consider yourself a tense (nervous) person?" reveals the intense psychological strain embedded in the lives of dental students. This pervasive stress doesn't remain confined to the mind; it seeps into the body, manifesting as physical symptoms as reflected in the next most common response, "Do you have pain in the neck or a stiff neck?" reported by 43.5% of participants. Additionally, 30.8% of students answered affirmatively to "Do you ever clench or grind your teeth?" These responses paint a vivid picture of how chronic stress silently tightens its grip, transforming psychological burden into tangible musculoskeletal distress.

These findings echo the work of Garg R et al.[4] on Malaysian dental students, powerfully reinforcing the deep-rooted connection between psychological stress and TMD symptoms. Yet, a starkly contrasting picture emerges from the study by Chandak RM et al.[7] Paradoxically, despite these lower markers of psychological stress, the study revealed a dramatically higher prevalence of frequent headaches and persistent neck pain or stiffness. This striking divergence between the studies lays bare the intricate and multifaceted nature of TMD, a condition shaped by an unpredictable interplay of mind and body.

In our study, 54.7% of BDS students reported moderate stress rising starkly to 60.6% among MDS students. This sharp increase reflects the mounting pressure postgraduate students face as they navigate a demanding landscape of advanced clinical duties, thesis writing, academic teaching, and an unyielding push for research output. The weight of these expectations may significantly elevate their risk for stress-induced conditions such as temporomandibular disorders.

Our findings partially align with study of Ahuja V et al.[1] on Ghaziabad dental students, yet key trends diverge, likely driven by the stark imbalance in sample sizes, with 292 BDS versus only 94 MDS participants in our study casting doubt on the strength and clarity of direct comparisons.

We observed a statistically significant association between the presence of clenching, grinding and the frequency of experiencing emotional distress triggered by unforeseen circumstances. In our study, 119 students affirmed "Do you clench or grind your teeth?" and out of them 92(77.3%) reported "feeling upset because of something that happened unexpectedly." This association highlights a potential clinical red flag for underlying headaches and impaired stress coping mechanisms among students. This relationship is well-documented in existing literature, where stressful life events are known to aggravate daytime bruxism. Our findings are in concordance with the study by Alkhudhairy et al[15]

Volume 8, Issue 4; July-August 2025; Page No 207-214

which similarly identified a strong link between psychological stress and parafunctional behaviours among dental students.

Conclusion

This study highlights a critical yet often overlooked crisis, the strong link between temporomandibular joint dysfunction and the intense stress faced by dental students. Behind the pursuit of academic excellence lies a silent struggle, marked by grinding pressure, relentless schedules, and mounting clinical demands contributing to symptoms like jaw pain, headaches, joint clicking, and neck stiffness. Dental schools must prioritize student wellness by implementing accessible counselling, stress management programs, life skills training, ergonomic education, and routine TMJ screenings. Empowering students to recognize early symptoms and seek help is vital, but lasting change requires a cultural shift, one that integrates mindfulness, restorative practices, and curriculum reforms to proactively address the mental and physical toll of dental education.

References

1. Ahuja V, Ranjan V, Passi D, Jaiswal R. Study of stress-induced temporomandibular disorders among dental students: An institutional study. Natl J Maxillofac Surg. 2018 Jul- Dec;9(2):147-154
2. Bimb, K & Budhthoki, M & Khapung, A & Singh, SK. (2020). Temporomandibular Disorders and Perceived Emotional Stress Among Medical and Dental Students Studying in a Private Medical Institution in Kathmandu, Nepal. Journal of Nepalese Prosthodontic Society. 3. 67-74.
3. Wisha Mubeen, Mariyam Khalid, Aliza Kamran, Faisal Izhar, Maha Tanvir, Shafia Hassan (2024) Examination-related stress leads to temporomandibular joint disorders in medical and dental students - an institutional-based study. 40(1):61-65
4. Ranjana Garg, Kevin Chee Pheng Neo, Jing Yu Lee, Mei Kei leong, Joshua Kim Chwen Ting, Donni Sonjaya. Association of Stress with Prevalence of TMJ Dysfunction in Undergraduate Dental Students. Dentika Dental Journal 2023; 26(1): 35-4
5. Nakra, Pranav & Rathod, Dev & Pawar, Saurabhachandra (2021) Association between stress and temporomandibular disorders among medical professionals of Udaipur city, India. International Journal of Applied Dental Sciences. 8. 517-520
6. Khawar S, Bari N, Rao AH, Malik AA, Nasir S, & Kayani A (2025) Association between Temporomandibular Joint dysfunction and Stress in Undergraduate BDS Students of Rawalpindi/Islamabad: Temporomandibular Joint Dysfunction and Stress. Pakistan Journal of Health Sciences. 6(3), 67-71.
7. Chandak RM, Pandhripande RM, Sonule SS, Chandak MG, Rawlani SS. To assess the prevalence of signs and symptoms of temporomandibular disorders in Vidarbha population by Fonseca's questionnaire. J Oral Res Rev 2017; 9:62-6.
8. Nomura, K, Vitti M, de Oliveira AS, Chaves TC, Semprini M, Siéssere S, Hallak JEC, Regalo SCH (2007) Use of the Fonseca’s questionnaire to assess the prevalence and severity of temporomandibular disorders in Brazilian dental undergraduates. Brazilian Dental Journal, 18(2) 163–167.
9. Conti PC, Ferreira PM, Pegoraro LF, Conti JV, Salvador MC. A cross-sectional study of prevalence and etiology of signs and symptoms of temporomandibular disorders in h
10. igh school and university students. J Orofac Pain. 1996 Summer;10(3):254-62.
11. Al Hayek SO, Al Thunayan MF, AlGhaihab AM, AlReshaid RM, Omair A. Assessing stress associated with temporomandibular joint disorder through Fonseca's anamnestic index among the Saudi physicians. Clin Exp Dent Res. 2019; 5:52–58.
12. Sevgi Özdinç PhD, Hilal Ata MSc, Halit Selçuk MSc, Hilal Başak Can MSc, Nimet Sermenli MSc & Fatma Nesrin Turan PhD (2018): Temporomandibular joint disorder determined by Fonseca anamnestic index and associated factors in 18- to 27-year-old university students, CRANIO®, 38(5), 327–332.
13. Venkatesh SB, Shetty SS, Kamath V. Prevalence of temporomandibular disorders and its correlation with stress and salivary cortisol levels among students. (2021) Pesqui Bras Odontopediatria Clín Integr. 2021; 21: e0120.

Volume 8, Issue 4; July-August 2025; Page No 207-214

14. Bagis B, Ayaz EA, Turgut S, Durkan R, Özcan M. Gender difference in prevalence of signs and symptoms of temporomandibular joint disorders: a retrospective study on 243 consecutive patients. Int J Med Sci. 2012; 9(7): 539-44.
15. Taneja P, Nagpal R, Marya CM, et al. Temporomandibular Disorders among Adolescents of Haryana, India: A Cross-sectional Study. Int J Clin Pediatr Dent 2019; 12(6): 500–506
16. Alkhudhairy MW, Al Ramel F, Al Jader G, Al Saegh L, Al Hadad A, Alalwan T, et al. A self-reported association between temporomandibular joint disorders, headaches, and stress. J Int Soc Prevent Communit Dent 2018; 8:371-80.
17. Fonsêca D. Disfunçäo Craniomandibular DCM: Diagnóstico Pela Anmnese. Universidade de São Paulo; Sao Paolo, Brazil: 1992
18. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav. 1983 Dec; 24(4): 385-96.

Tables

Table 1: Distribution of TMD among study participants according to gender and age

Variables	**TMD**					
Gender	**No TMD (%)**	**Mild TMD (%)**	**Moderate TMD (%)**	**Severe TMD (%)**	**Total**	**p- Value**
Female	110(42.9)	124(48.4)	20(7.8)	2(0.78)	256	0.0004*
Male	85(65.3)	40(30.7)	4(3.07)	1(0.76)	130	
Age						
17-24	138(50.3)	115(41.9)	20(7.2)	1(0.36)	274	0.271
25-32	57(50.8)	49(43.7)	4(3.57)	2(1.7)	112	

* Significant p-value< 0.05

Table 2: Distribution of perceived stress among study participants according to gender and age

Variables	**Stress**		

Volume 8, Issue 4; July-August 2025; Page No 207-214

Gender	Low Stress (%)	Moderate Stress (%)	High Stress (%)	Total	p-Value
Female	61(23.8)	162(63.2)	33(12.8)	256	0.00005*
Male	59(45.3)	55(42.3)	16(12.3)	130	
Age					
17-24	82(29.9)	150(54.7)	40(14.5)	274	0.070
25-32	38(33.9)	67(59.8)	7(6.25)	112	

* Significant p-value< 0.05

Table 3: Distribution of TMD among study participants according to profession

Profession	No TMD (%)	Mild TMD (%)	Moderate TMD (%)	Severe TMD (%)	Total	p- Value
BDS	148(50.6)	122(41.7)	21(7.19)	1(0.34)	292	0.1797
Post Graduate	47(50)	42(44.6)	3(3.19)	2(2.12)	94	

* Significant p-value< 0.05

Table 4: Distribution of perceived stress among study participants according to educational status

Profession	Low Stress (%)	Moderate Stress (%)	High Stress (%)	Total	p-Value
BDS	88(30.1)	160(54.7)	44(15.0)	292	0.0472*
Post Graduate	32(34.04)	57(60.6)	5(5.31)	94	

* Significant p-value< 0.05

Table 5: Association between stress and TMD among study participants

	TMD					
Stress Level	**No TMD (%)**	**Mild TMD (%)**	**Moderate TMD (%)**	**Severe TMD (%)**	**Total**	**p-Value**

Volume 8, Issue 4; July-August 2025; Page No 207-214

High	14(28.5)	26(53.06)	8(16.3)	1(2.04)	49	0.00001*
Moderate	92(42.5)	109(50.4)	14(6.48)	1(0.47)	216	
Low	88(72.7)	29(23.9)	2(1.65)	1(0.82)	121	

* Significant p-value< 0.05

Volume 8, Issue 4; July-August 2025; Page No 207-214