

Tempromandibular Disorders and Perceived Emotional Stress Among Medical and Dental Students Studying in a Private Medical Institution in Kathmandu, Nepal

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Abstract

Introduction: Tempromandibular disorder (TMD) is a collection of complex signs and symptoms that typically involves the tempromandibular joint (TMJ) and masticatory muscles. Multifactorial etiologies of TMD include occlusal disharmony, oral habits, dysfunction of masticatory muscles and adjacent structures, emotional stress and extrinsic and intrinsic changes on TMJ structure. Stress has been inflicted as one of the major etiological factor for developing TMD.

Materials and Methods: An observational cross sectional study was conducted among the medical and dental undergraduate students and interns studying in Nepal Medical College and Teaching Hospital, Kathmandu, Nepal from January 2018 to February 2018. Fonseca Amnestic Index (FAI) was used to evaluate and to characterize the TMD signs and symptoms. The stress factor was assessed by Cohen Perceived Stress Scale (CPSS-10) which is a self report measure of stress level which consist of 10 questionnaires in which the subjects responds on how much they suffer from the listed symptoms. Data was analyzed using the Statistical Package of Social Sciences (SPSS) Version 16.0. Association of different variables were tested, with Chi square test, with value less than 0.05 as statistically significant.

Results: A total of 487 students had participated. Among them 32.4% were male and 67.6% were female. Among the participants, 44.6% were from dental school (BDS) and 55.4% were from medical school (MBBS). The age group of the participants was 17 to 27 years. Prevalence of TMD was 50.3% in the study participants. Among the participants with TMD, 81.2% had mild TMD, 17.2% had moderate TMD and 1.6% had severe TMD. Out of the total participants 16.4% had low stress, 76.6% had moderate stress and 7% had high stress. This study showed statistically significant association between stress factor and tempromandibular disease ($p < 0.001$).

Conclusion: Higher rate of TMD and level of stress has become common in medical and dental college students. Identifying the TMD at the early age can control or at least minimize its long term effects. Moreover, identifying the stress factor highlights the importance of providing support programs and implementing preventive measures to help students.

Key words: Cohen perceived stress scale; Fonseca amnestic index; Stress; Tempromandibular disorders.

Conflict of Interest: No

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Introduction

Tempromandibular disorder (TMD) is a collection of complex signs and symptoms that typically involves the tempromandibular joint (TMJ) and masticatory muscles.¹ The presenting features of TMD includes pain in the pre-auricular area, TMJ or masticatory muscles,

restriction, limitation or deviation in mandibular motions, clicking in the TMJ during mandibular movements and fatigue of the head and neck muscles which are not associated to any growth and development disorders, systemic diseases and trauma.¹⁻⁵ Multifactorial etiologies of TMD include occlusal disharmony, oral habits, dysfunction of masticatory muscles and adjacent structures, emotional stress and extrinsic and intrinsic changes on TMJ structure.^{1-5, 9-16}

Studies have shown a high prevalence (60-70%) of TMD in general populations showing at least one sign of the disorder in a lifetime but only 5% of them seek for the treatment.^{1,5} Studies among the undergraduate university students have shown 40-70% prevalence of TMD.^{4,6} Studies in the Indian subcontinent university students have shown a prevalence of 45-65% of TMD.^{12, 13} Study on preclinical dental students of one of the dental colleges in Nepal has shown a prevalence of 38.66%.¹⁴

Due to variability of complaints, TMD is diagnosed by associating signs and symptoms. Fonseca Amnestic Index (FAI) developed from Helkimo's index, is used to evaluate and to characterize the TMD signs and symptoms in a short period of time, with low cost, easy understanding and having no influence of the evaluator in the answers of the question.^{1, 2,4, 6-8} Several studies have reported the relationship between TMDs and stress affects parafunctional activities by the limbic system that influences muscle activity. Millan has reported the molecules involved in the mechanism of stress are same associated with the pain resulting in impaired sensation of pain in stressful situations.¹¹ De Leuw et al is equivocal that muscle dysfunction and pain are often caused by stress induced muscle hyperactivity.¹¹ Cohen's perceived stress scale (CPSS 10) is a brief measure of stress administered via self-report in which the subjects responds on how much they suffer from the listed symptoms in

Likert scale ranging from 0 (never) to 4 (very often). Studies have proved the validity and consistency of CPSS as a measure of stress.¹⁷⁻¹⁹

TMD has been reported with high prevalence in the population with large number of adolescents being affected with it. Stress has been inflicted as one of the major etiological factor for developing TMD. As in case of medical and dental students, high prevalence of stress has been reported. In the management of TMD unless the etiological factors are eliminated there will be little or no improvement with greater chance of recurrence with greater degenerative changes in TMJ. But it is always difficult to eliminate the stress from daily routine. Thus by identifying the TMD at the early age we can control or at least minimize its long term effects. Moreover identifying the stress factor highlights the importance of providing support programs and implementing preventive measures to help students, particularly those who are most susceptible to higher levels of these psychological conditions.

Materials and Methods

An observational cross sectional study was conducted among the medical and dental undergraduate students and interns studying in Nepal Medical College and Teaching Hospital, Kathmandu, Nepal from January 2018 to June 2019. All the participants were explained about the objective of study and the questionnaires for the study.

Participants previously diagnosed with orofacial pain and undergoing treatment for TMD, participants with any local and/or systemic diseases associated to TMJ or with somatognathic system impairment and those unwilling to participate were not included for the study. Participants who gave written consent were included in the study. Confidentiality of all the participants were maintained

Fonseca Amnestic Index (FAI) (1992) developed from Helkimo's index (1974), was used to

evaluate and to characterize the TMD signs and symptoms. For analysis following values were assigned: 10 for yes, 5 for sometimes and 0 for No. The total score gave the Fonseca index classification. Total score for the clinical index was 100 with classification as 0-15 (no TMD), 20-40 (mild TMD), 45-65 (moderate TMD) and 70-100 (severe TMD).

The stress factor was assessed by Cohen Perceived Stress Scale (CPSS-10) which is a self report measure of stress level which consist of 10 questionnaires in which the subjects responds on how much they suffer from the listed symptoms in Likert scale ranging from 0 (never) to 4 (very often). The values of the

answers were given in the Likert scale of 0 (never), 1 (almost never), 2 (sometimes), 3 (fairly often) and 4 (very often). Total score is 40 with the range of 0-13 (low stress), 14-26 (moderate stress) and 27-40 (high perceived stress).

Data was analyzed using the Statistical Package of Social Sciences (SPSS) Version 16.0. Association of different variables were tested with Chi square test with value less than 0.05 statistically significant. Ethical clearance for this study was approved by Nepal Medical College - Institution Review Committee (NMC-IRC).

Fonseca's Questionnaire for Assessment of TMD

SN	QUESTIONS	NO	SOMETIMES	YES
1	Is it hard for you to open your mouth?			
2.	Is it hard for you to move your mandible from side to side?			
3.	Do you get tired /muscular pain while chewing?			
4.	Do you have frequent headaches?			
5.	Do you have pain on the nape or stiff neck?			
6.	Do you have earaches or pain in temporomandibular joints?			
7.	Have you noticed any TMJ clicking while chewing or when you open your mouth?			
8.	Do you clench or grind your teeth?			
9.	Do you feel your teeth do not articulate well?			
10.	Do you consider yourself a tense (nervous) person?			

Questionnaires for Cohen's Perceived Stress Scale (CPSS-10) scoring

SN	QUESTIONS	NEVER	ALMOST NEVER	SOMETIMES	FAIRLY OFTEN	OFTEN
1.	In the last month, how often have you been upset because of something that happened unexpectedly?					
2.	In the last month, how often have you felt unable to control the important things in your life?					
3.	In the last month, how often have you felt nervous or stressed?					
4.	In the last month, how often have you felt confident about your ability to handle personal problems?*					
5.	In the last month, how often have you felt that things were going your way? *					

6.	In the last month, how often have you found that you could not cope with all the things you had to?					
7.	In the last month, how often have you been able to control irritations in your life? *					
8.	In the last month, how often have you felt that you were on top of things? *					
9.	In the last month, how often have you been angered because of things that happened that were outside of your control?					
10.	In the last month, how often have you felt that difficulties were piling up so high that you could not overcome them?					

Results

A total of 487 students had participated. Among them 158 (32.4%) were male and 329 (67.6%) were female. Among the participants, 217 students (44.6%); 166 female and 51 male were from dental school (BDS) and 270 students (55.4%); 163 females and 107 males were from medical school (MBBS). The age group of the participants was 17 to 27 years. Students were from the first year of medical and dental school to the internship.

Out of 487 study participants, 242 participants (110 BDS and 132 MBBS) were graded as having no TMD and 245 having TMD. Prevalence of TMD was 50.3% among the study participants. Out of the participants with TMD, 199 (81.2%) had mild TMD, 42 (17.2%) had moderate TMD and 4 (1.6%) had severe TMD. According to gender, 46.2% of the males i.e. 73 and 52.3% of females i.e. 172 had TMD. According to the students' category, 49.3% of BDS students i.e. 107 and 51.1% of MBBS students i.e. 138 have TMD. Among 199 students having mild TMD, 94 were BDS students and 105 were MBBS students. Moderate TMD was seen in 42 participants among which 13 were BDS and 29 were MBBS. Severe TMD was seen in just 4 of the MBBS students. These data shows

that TMD is slightly more common in female students than male students in both BDS and MBBS category.

Out of the total, 80 participants (16.4%) had low stress, 373 (76.6%) had moderate stress and 34 (7%) had high stress. Low stress level was found in 22 BDS students and 58 MBBS students. Moderate stress level was found in 169 BDS students and 204 MBBS students. High stress level was seen in 26 BDS students and 8 MBBS students.

Association of students of MBBS and BDS and level of TMD was not statistically significant ($p=0.07$).

Similarly association of BDS and MBBS students and different level of stress showed statistically significant association between the variables ($p<0.001$).

Among 80 participants with low stress level, TMD was present in 26 whereas 54 had no signs of TMD. Those 373 with moderate stress level 195 had TMD and 178 did not have TMD. Similarly, 34 with high stress level, 24 had TMD and 10 did not have any TMD. This study showed statistically significant association between stress factor and temporomandibular disease ($p<0.001$)

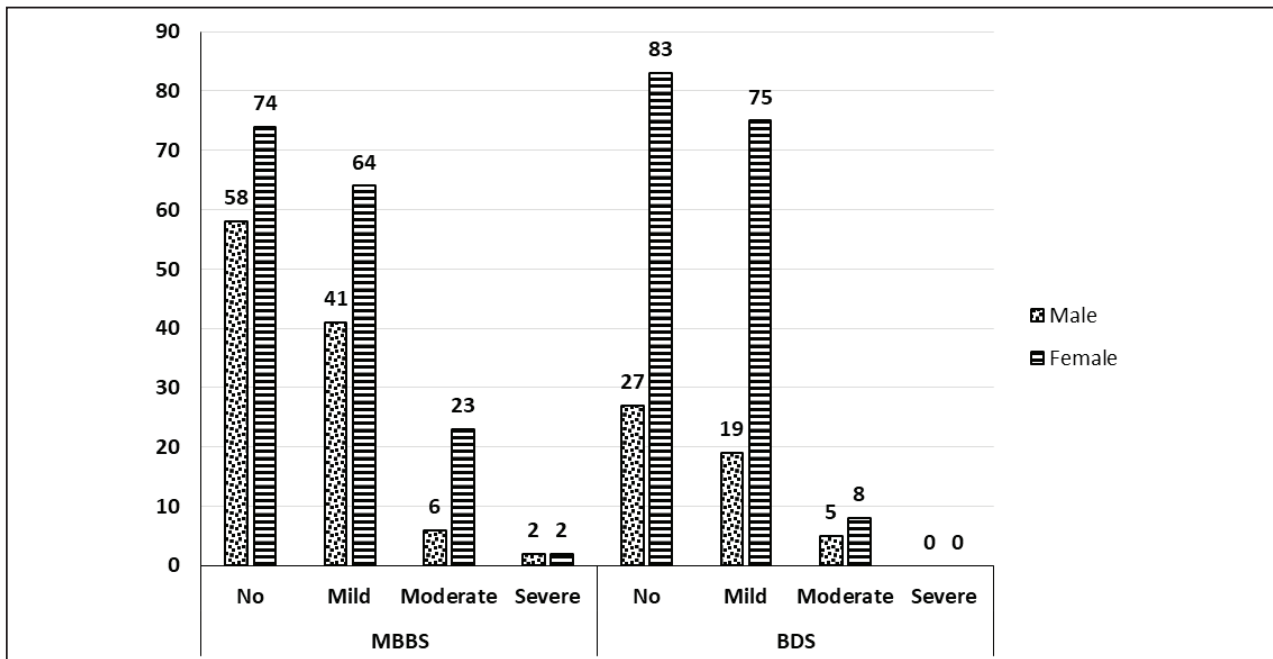


Figure 1: Distribution of study participants according to the level of TMD using Fonseca index

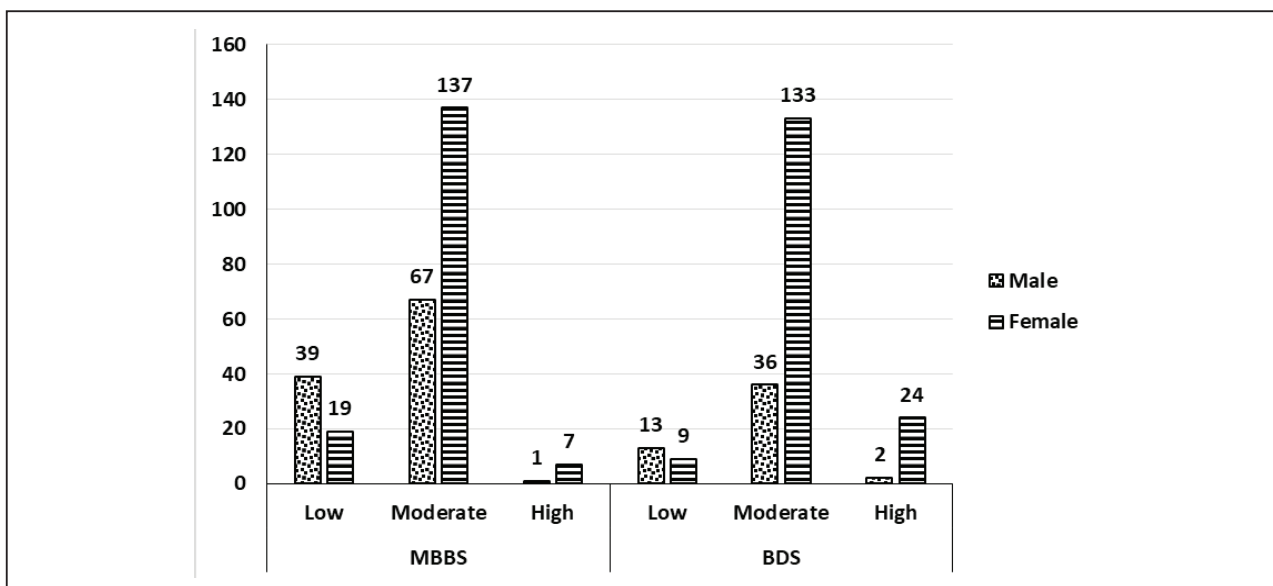


Figure 2: Distribution of study participants according to the degree of stress using CPSS-10

Table 1: Student category and Grading of TMD in Fonseca score cross tabulation

		Grading of TMD in Fonseca score				Total	p-value
		No TMD	MILD TMD	MODERATE TMD	SEVERE TMD		
Student of	BDS	110	94	13	0	217	0.07
	MBBS	132	105	29	4	270	
Total		242	199	42	4	487	

Table 2: Student category and Grading of Cohen's perceived stress cross tabulation

		Grading of Cohen's perceived stress			Total	p-value
		LOW Stress	MODERATE Stress	HIGH Stress		
Student of	BDS	22	169	26	217	<0.001
	MBBS	58	204	8	270	
Total		80	373	34	487	

Table 3: Level of stress and TMD cross tabulation

Stress factor	TMD present	TMD absent	p-value
Low stress	26	54	<0.001
Moderate stress	195	178	
High stress	24	10	

Discussion

Prevalence of TMD in our study is 50.3% and is more common in female than male in both BDS and MBBS category. Higher prevalence of TMD (71.9%) was reported by Augusto in Brazilian undergraduate students of health sciences courses,¹⁰ TMD prevalence of 77.8% was reported by Ahmed and Abuaffan among medical students of Sudan.¹⁵ Result similar to this study was shown by Nomuro et al in their study (53.21%) in Brazilian dental undergraduates and by Bicaj et al (56%) in Prishtina Dental Students using Fonseca Questionnaires.² But Mutlu et al showed less prevalence of 17% in Turkish dental undergraduate students.³ In our study female showed higher prevalence (63.11%) as compared to males (40.62%)¹ which can be due to higher number of female participants. Majumder et al showed prevalence of TMD in Indian Medical University student to be 31.1% and Modi et al showed the prevalence of 45.16% using Fonseca questionnaires in medical and dental undergraduate students with statistically significant difference in the gender.^{12,13} A study by Tiwari et al in medical and dental students in Nepal showed that 38.66% had remarkable TMD with greater prevalence in male which is in contrast to our study.¹⁴ In our study 49.3% of BDS students and 51.1% of MBBS students have TMD.

Results of present study showed that higher prevalence of moderate stress level in both BDS (77.9%) and MBBS (75.6%) students. This is significantly more than the study carried by Kharel et al where he studied 375 medical and dental students in Nepal using the Cohen PSS and found the prevalence of stress was 40.34% in medical students and 34.1% in dental students¹⁹. High stress level was found more in BDS students (12%) than MBBS students (3%) which is also in contrast to the study by Kharel et al where high stress was more in MBBS students. Moderate and high stress levels were more common for females among both BDS and MBBS students.

This study showed statistically significant relationship between stress factor and temporomandibular disorder ($p < 0.001$) which is equivocal with other studies. Harris and Fine have shown a significant relation between TMD and anxiety with 50-75% of TMD patient have stressful life prior to onset of their symptoms.³ Riffel et al have shown a strong correlation between TMD and stress in university students.⁶ Augusto et al have also reported 71.9% the university students with associated TMD had high scale of perceived stress scale.¹⁰ Majumder et al has shown that 206 of 300 (66.2%) medical and dental students with TMD also had signs of anxiety and depression ($p < 0.001$).¹²

Conclusion

HigherrateofTMDandlevelofstresshasbecome common in medical and dental college students. Academic factors along with other factors like relationship with the peers and faculties, family environment,economical status etc. affect their psychological health which determine their academic performances and physical health. In the management of TMD unless the etiological factors are eliminated there will be little or no improvement with greater chance of recurrence with greater degenerative changes in TMJ. But it is always difficult to eliminate the stress from daily routine. Thus by identifying the TMD at the early age we can control or at least minimize its long term effects. Moreover identifying the stress factor highlights the importance of providing support programs and implementing preventive measures to help students, particularly those who are most susceptible to higher levels of these psychological conditions.

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