



Association between COVID-19 Anxiety and Temporomandibular Disorders Among Dental Students - an Institutional Survey

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ABSTRACT

OBJECTIVE: The objective of this study was to find association between COVID-19 anxiety and temporomandibular disorders among dental students in an institutional survey.

METHODOLOGY: This descriptive cross-sectional study was conducted on undergraduate and postgraduate students of Khyber college of Dentistry, Peshawar from August to November 2021. Exclusion criteria was psychological disorders like anxiety, depression; anti-anxiety and anti-depressant medication; house officers and faculty. Data was collected on a questionnaire which consisted of Fonseca anamnestic index (IAF) to diagnose TMD, Hospital anxiety depression scale (HADS) to assess anxiety, depression and COVID-19 anxiety scale (CAS) to evaluate COVID-19 related anxiety. For data analysis, mean \pm SD was used for age. Frequency and percentages were done for gender, TMD, anxiety, depression and COVID-19 anxiety. For association between categorical variables, chi-square was applied. Cross-tabulation and prevalence formula were used to find out prevalence of anxiety, depression and COVID-19 anxiety in TMD & non-TMD cases.

RESULTS: A total of 181 students participated in this study. Out of this, 83(45.9%) were males and 98(54.1%) were females with a mean age of 22.7 ± 2.4 years. 99 (54.7%) were TMD cases i.e., greater than non-TMD cases (45.3 %). A higher trend of anxiety (78%) and depression (56%) was seen. Out of 99 (54.7%) TMD cases, 73 (73.7%) were with anxiety. But anxiety was even greater (n=69, 84.1%) in non-TMD cases. Depression was also almost equal in both TMD and non-TMD cases with a prevalence of 1.09. COVID-19 anxiety was seen in very few (1.1%). No association of TMD was seen with anxiety, depression and COVID-19 anxiety (p value = 0.05)

CONCLUSION: There was no significant association found between COVID-19 anxiety and temporomandibular disorders in dental students of this study, with a very less prevalence of COVID-19 anxiety among them.

KEYWORDS: COVID-19, Temporomandibular disorder (TMD), COVID-19 anxiety, anxiety, depression, dental students

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INTRODUCTION

COVID-19, is a new illness which emerged in Wuhan city of China in beginning of December of 2019, causative organism being a novel virus named coronavirus (SARS-CoV-2).¹ COVID-19 infection can be fatal if it causes respiratory distress which necessitates intensive care.² Since mode of transmission of SARS-CoV-2 is through close contact of one person with another, it led to strict quarantine measures worldwide.³ These restrictions leading to disruption of day to day routine caused a major influence on mental health of people.⁴

Temporomandibular disorders (TMD) is a group of disorders

which affects temporomandibular joint, muscles of mastication and associated musculoskeletal structures.⁵ Among the social dental diseases, TMD is on number three with a prevalence of 10-15 % across the globe and the incidence is still on rise. Epidemiological studies suggest that it usually involves 41% of general population.⁶ TMD prevalence in dental students in various previous studies has been reported as 36.9% and 62.8%.⁷ TMD and its severity increases with psychological issues like stress, anxiety, depression and somatization.⁸

COVID-19 pandemic challenged the delivery of health care services worldwide in general, and dentistry, in particular.⁹ In dentistry, while working inside oral cavity, droplets and aerosols admixed with saliva and blood of patient are generated.

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Transmission of COVID-19 which is via aerosols and droplets thus is a thing of concern in dentistry.¹⁰ All students from medicine, dentistry and nursing, due to their interactions with COVID-19 positive patients, are at increased risk of developing COVID-19 infection, stress, anxiety and depression.¹¹

Among Turkish dental students, a poorer sleep quality and elevated stress, anxiety, and depression during COVID-19 pandemic resulted in an increase in TMD.¹²

Thus, COVID-19 related anxiety among dental students, due to close association of dentistry with a very high risk of transmission of COVID-19 infection, can cause onset or aggravation of TMD. No studies so far have been carried out during this COVID-19 pandemic regionally and locally to show presence of this COVID-19 anxiety and its association with temporomandibular disorders among dental students.

Aim: The objective of this study was to find association between COVID-19 anxiety and temporomandibular disorders among dental students in an institutional survey.

METHODOLOGY

Design of the study

It was a descriptive cross-sectional study.

Sample

Sample included under- and postgraduate students of Khyber college of Dentistry, Peshawar

Assessment

This study was conducted from August to November 2021.

Sampling method

Convenience sampling method was used.

Inclusion criteria

Undergraduate students of all four professional years and postgraduate students were included in the study.

Exclusion criteria

Psychological disorders like anxiety, depression; anti-anxiety and anti-depressant medication; house officers and faculty members were excluded.

Procedure

Data was collected on a questionnaire after approval from institutional ethical committee. Questionnaire consisted of exclusion criteria at top, informed consent, demographics including professional year/postgraduate year along with Fonseca anamnestic index (IAF) to diagnose TMD, Hospital anxiety depression scale (HADS) to assess anxiety, depression and COVID-19 anxiety scale (CAS) to evaluate COVID-19

related anxiety.

The reliability of IAF, HADS and CAS using Cronbach's alpha test was 0.73, 0.74 and 0.74, respectively, deeming it appropriate to use.

Data Analysis

Data analysis was carried out on SPSS version 25. Mean \pm SD was used for age. Frequency and percentages were done for gender, TMD, anxiety, depression and covid-19 anxiety. For association between categorical variables, chi-square was applied. Cross-tabulation and prevalence formula were used to find out prevalence of anxiety, depression and COVID-19 anxiety in TMD & non-TMD cases.

RESULTS

Demographics

A total of 181 students participated in this study. Of 181 students, 45(24.9%) were post-graduate residents, whereas 40(22.1%), 33(18.2%), 49(27.1%), 14(7.7%) were from 4th, 3rd, 2nd and 1st professional BDS, respectively. Out of this, 83(45.9%) were males and 98(54.1%) were females with a mean age of 22.7 ± 2.4 years.

TMD

TMD cases were greater in number than non-TMD cases (Figure 1).

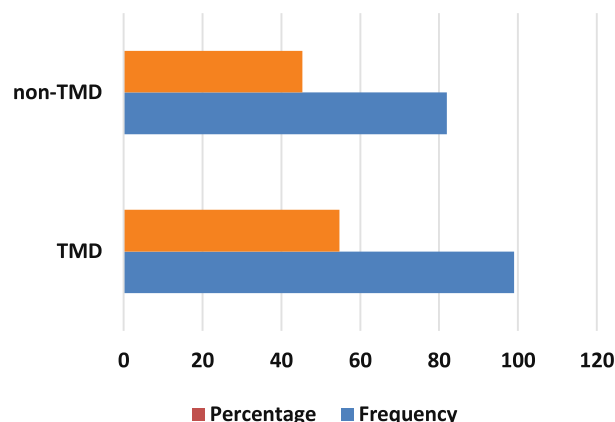


Figure 1: Frequency and Percentage of TMD and non-TMD cases

Anxiety, Depression & COVID-19 anxiety

Anxiety and depression positivity was more than normal cases (pie charts 2 & 3) whereas 179 students (98.9%) were without COVID-19 anxiety and only 2(1.1%) with it.

Chi-square associations of TMD

No association was found between TMD, anxiety, depression and Covid anxiety (Table 1). In addition there was no gender predisposition in terms of TMD, Anxiety and depression.

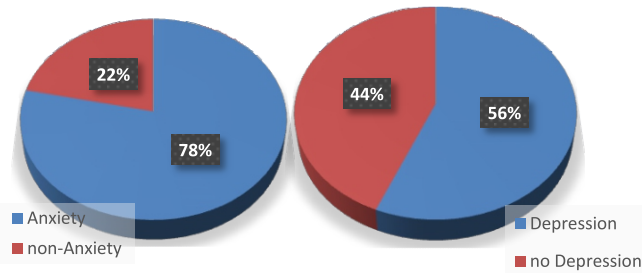


Figure 2: a) Percentage of anxiety as a result of A-HADS, b) Percentage of depression as a result of D-HADS scoring

Variables		Non-TMD	TMD	chi-square	p-value
Gender	Male	45	38	4.915	0.027
	Female	37	61		
Anxiety	Positive	69	73	2.875	0.09
	Negative	13	26		
Depression	Positive	44	58	0.443	0.506
	Negative	38	41		
Covid anxiety	Positive	0	2	1.675	0.196
	Negative	82	97		

Table 1: Chi-square Association between TMD and different variables. p value less than 0.05 is significant

Cross-tabulations & Prevalence

It is shown in Tables 2. Anxiety was 0.84 times less prevalent in TMD than non-TMD, while the Prevalence of Depression was 1.09. Interestingly, COVID-19 anxiety was almost non-existent.

	no Anxiety	Anxiety	Total
no TMD	13	69	82
TMD	26	73	99
Total	39	142	181

b) Prevalence of depression in TMD & non-TMD cases			
	no depression	Depression	Total
no TMD	38	44	82
TMD	41	58	99
Total	79	102	181

c) Proportion of COVID-19 anxiety in TMD & non-TMD cases			
	no CA	CA	Total
no TMD	82	0	82
TMD	97	2	99
Total	179	2	181

Table 2: Showing a) prevalence of anxiety in TMD & non-TMD cases b) prevalence of depression in TMD & non-TMD cases and c) proportion of Covid-19 anxiety in TMD & non-TMD cases

DISCUSSION

In this study, mean age was 22.7 ± 2.4 years which is close to results of other similar studies on dental students during

COVID-19 pandemic. Medeiros³ and Hakami et al¹³ reported similar ages in their studies, with mean ages of 21.46 years (± 2.37) and 21.76 years (± 1.859), respectively. This could be due to lesser number of postgraduate students than undergraduate students in this study.

Female predominance (54.1%) was seen in this study. Similar data, with a greater prevalence of females, was observed in studies by Gonclaves (59.9%)¹⁴, Hakami et al (54.7%)¹³ and Medeiros (77%)³. Also, a statistically significant association of gender with TMD ($p = 0.02$) was found in the current study which is also in line with Gonclaves¹⁴ results. Females are more prone to TMD because they usually stress about things easily. Females also have higher estrogen level which is usually implicated in causing TMD as temporomandibular joint (TMJ) has increased expression of estrogen receptors.¹⁵

Overall, among all 181 undergraduate and postgraduate students, 99 (54.7%) were TMD cases i.e., greater than non-TMD cases (45.3%). An identical result (54.8%) was reported in a study by Medeiros during the COVID-19 pandemic.³ The findings of Silva et al study suggested even higher values of TMD positivity (82.4%) in Brazilian dental students during the pandemic state.¹⁶ Greater positivity of TMD in dental undergraduate and postgraduate students may be due to academic stress which is a significant causative factor for TMD in dental students.¹⁷ Time away from home and family also risks depression and subsequent TMD development.¹⁸ Another stressor can be social restrictions during COVID-19 pandemic and its hazards associated with dentistry. Moreover, dental students with better understanding of TMD are more forthcoming in answering FAI used for diagnosis of TMD.

A higher trend of anxiety (78%) and depression (56%) was seen in this population without any association with TMD. Medeiros study was also unable to show any association of TMD with anxiety and depression.³ Out of 99 (54.7%) TMD cases, 73 (73.7%) were with anxiety. But anxiety was even greater ($n=69$, 84.1%) in non-TMD cases. Depression was also almost equal in both TMD and non-TMD cases with a prevalence of 1.09. A study by Azevedo presented a matching result of increased anxiety in dental students but without any association with TMD in dental students.¹⁹ High level of stress, anxiety and depression seen in undergraduate and postgraduate students is due to academic, teaching and clinical work overload. COVID-19 anxiety was seen in very few (1.1%) with no association with TMD in this study. Not a single study, which studied CAS based COVID-19 anxiety and its association with TMD in dental students, was found. Regarding prevalence of anxiety during COVID-19 pandemic, a study by Zulfiqar showed a very high level of anxiety (92.9%) among dental students and dentists during COVID-19 pandemic²⁰ which is in contrast to

this study. Dental students of Braz-Jose study during the pandemic period also presented high values of anxiety (41%), depression and stress.²¹ Despite emergence of COVID-19 as global pandemic and its social restrictions, a very low prevalence of COVID-19 anxiety in population of this study can be due to their less social isolation during the COVID-19 period and less acceptance of erroneous information related to its spread. A systematic review by Minervini et al stated that three out of their four reviewed studies have a consensus on significant association of COVID-19 anxiety with temporomandibular disorders which is in contrast to this study.²² The reason behind this can be a different population of the current study.

Limitations of the study: There was no questioning about presence of TMD before COVID-19 pandemic to see if they were new onset or already existing TMD. The timing of the study may coincide with the professional exam schedule of some of dental students. Considering this overlap, it's important to note its potential impact on stress levels and Temporomandibular Disorders (TMDs) among students.

Recommendations/Clinical implications: Owing to high anxiety level seen in dental students, there should be efforts at institutional level to increase awareness about anxiety recognition and its timely management to produce mentally and professionally better dental and oral healthcare workers.

CONCLUSION

There was no significant association found between COVID-19 anxiety and temporomandibular disorders in dental students of this study, with a very less prevalence of COVID-19 anxiety among them.

Conflict of Interest: The authors declare no conflict of interest.

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REFERENCES

- Lu H, Stratton CW, Tang YW. Outbreak of pneumonia of unknown etiology in Wuhan, China: the mystery and the miracle. *J Med Virol.* 2020;92(4):401-402.
- Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet.* 2020;395(10223):497-506.
- Medeiros RA, Vieira DL, Silva EVFD, Rezende LVML, Santos RWD, Tabata LF. Prevalence of symptoms of temporomandibular disorders, oral behaviors, anxiety, and depression in Dentistry students during the period of social isolation due to COVID-19. *J Appl Oral Sci.* 2020 Nov 30;28:e20200445.
- Kim HH, Jung JH. Social isolation and psychological distress during the COVID-19 pandemic: a cross-national analysis. *Gerontologist.* (2021) 61:103-13.
- Weng S, Hou S, Jiao X, Sun Y. Adverse Impacts of Temporomandibular Disorders Symptoms and Tooth Loss on Psychological States and Oral Health-Related Quality of Life During the COVID-19 Pandemic Lockdown. *Front Public Health.* 2022;10:899582.
- Małgorzata P, Małgorzata KM, Karolina C, Gala A. Diagnostic of temporomandibular disorders and other facial pain conditions-narrative review and personal experience. *Medicina.* (2020) 56,472.
- Srivastava KC, Shrivastava D, Khan ZA, et al. Evaluation of temporomandibular disorders among dental students of Saudi Arabia using Diagnostic Criteria for Temporomandibular Disorders (DC/TMD): a cross-sectional study. *BMC Oral Health.* 2021;21(1):211.
- Su N, Lobbezoo F, van Wijk A, van der Heijden GJ, Visscher CM. Associations of pain intensity and pain-related disability with psychological and socio-demographic factors in patients with temporomandibular disorders: a cross-sectional study at a specialised dental clinic. *J Oral Rehabil.* (2017) 44:187-96.
- Emodi-Perlman A, Eli I. One year into the COVID-19 pandemic - temporomandibular disorders and bruxism: What we have learned and what we can do to improve our manner of treatment. *Dent Med Probl.* 2021;58(2):215-218
- Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. *Int J Oral Sci.* 2020;12(1):9.
- Tonkaboni A, Razi-Avarzamani A, Sadrzadeh-Afshar MS. Effects of COVID-19 epidemic on mental health of dental students of Tehran University of Medical Sciences in 2020. *J Dent Educ.* 2023;87(1):43-49.
- Ga S, Ek i Özsoy H, Cesur Aydın K. The association between sleep quality, depression, anxiety and stress levels, and temporomandibular joint disorders among Turkish dental students during the COVID-19 pandemic. *Cranio.* 2021 Feb 5:1-6.
- Hakami Z, Khanagar SB, Vishwanathaiah S, et al. Psychological impact of the coronavirus disease 2019 (COVID-19) pandemic on dental students: A nationwide study. *J Dent Educ.* 2021;85(4):494-503.
- Dos Santos Gonçalves RM, Fernandes GVO, Fernandes JCH, Seabra M, Figueiredo A. Impact of COVID-19 on

- Portuguese Dental Students: A Cohort Study. *Healthcare (Basel)*. 2023;11(6):818.
15. Jedynek B, Jaworska-Zaremba M, Grzechocińska B, Chmurska M, Janicka J, Kostrzewa-Janicka J. TMD in Females with Menstrual Disorders. *Int J Environ Res Public Health*. 2021;18(14):7263.
 16. Silva FT da, Knorst JK, Maracci LM, Ferrazzo VA, Liedke GS, Silva TB, Marquezan M. Temporomandibular disorders and associated comorbidities among brazilian dental students during COVID-19. *Braz. J. Oral Sci.* 2022 Dec. 19 [cited 2023 Jun. 17];22(00):e237397.
 17. 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;9(2):147-154.
 18. Namvar MA, Afkari BF, Moslemkhani C, Mansoori K, Dadashi M. The Relationship between Depression and Anxiety with Temporomandibular Disorder Symptoms in Dental Students. *Maedica (Bucur)*. 2021;16(4):590-594.
 19. Fernandes Azevedo AB, Câmara-Souza MB, Dantas IS, de Resende CMBM, Barbosa GAS. Relationship between anxiety and temporomandibular disorders in dental students. *Cranio*. 2018;36(5):300-303.
 20. Zulfqar K, Rizwan Z, Zia SH, Rizwan G, Durani OK, Raja UB. Psychological Impact of Covid-19 on Dental Surgeons and Students. *J Islamabad Med Dental Coll*. 2021; 10(4).
 21. Braz-José C, Morais Caldas I, de Azevedo Á, Pereira ML. Stress, anxiety and depression in dental students: Impact of severe acute respiratory syndrome-coronavirus 2 pandemic. *Eur J Dent Educ*. 2022;10.1111/eje.12858.
 22. Minervini G, Franco R, Marrapodi MM, et al. The Association between COVID-19 Related Anxiety, Stress, Depression, Temporomandibular Disorders, and Headaches from Childhood to Adulthood: A Systematic Review. *Brain Sci*. 2023;13(3):481.

CONFLICT OF INTEREST

Author declared no conflict of interest

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AUTHORS CONTRIBUTIONS

NM&SS: Conception, Design of the work, Interpretation of data for the work, and Drafting, Reviewed, Final approval, Agreement to be accountable.

UN&SM: Conception, Design of the work, Data collection, and Drafting, Reviewed, Final approval, Agreement to be accountable.

TS&FU: Conception, Design of the work, Acquisition, Data Analysis, and Drafting, Reviewed, Final approval, Agreement to be accountable.



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