

“Association of Temporomandibular Disorder and Psychological Distress among Science and Commerce Students in Surat, India”

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ABSTRACT

Background: Temporomandibular disorders (TMD) are a collective term used to describe a number of related disorders involving temporomandibular joints, masticatory muscles and/or associated structures. TMD patients are more likely to have of anxiety and stress.

Aim: To find out the association between Temporomandibular disorder with Psychological distress among science and commerce students using Fonseca Anamnestic Index and DASS-21 respectively.

Materials and methods: 279 students were assessed using Fonseca Anamnestic Index for TMD. They were bifurcated into two Groups. Group A include Science Students and Group B include Commerce Students. DASS-21 scale was administered to evaluate psychological distress for each student who had TMD and total score was taken for the same. Pearson Correlation test was carried out for analysis of outcomes.

Results: Statistical analysis is proved that there is positive correlation between TMDs and psychological distress (stress, anxiety, and depression). The correlation co-efficient between TMD and Stress ($r=0.736$), Anxiety ($r=0.744$), Depression ($r=0.759$) in Group A students. The correlation co-efficient between TMD and Stress ($r=0.472$), Anxiety ($r=0.532$), Depression ($r=0.381$) in Group B. Both Group showed a positive correlation between TMD and Psychological distress with the significance of ($p<0.05$).

Conclusion: There was a greater Prevalence of sign and symptoms of TMD in science students than commerce students. According to the result, it was concluded that there is an association between TMD and psychological distress.

Keywords: TMJ, TMDs, stress, anxiety, depression, Fonseca Anamnestic Index, DASS-21.

Abbreviations: TMJ (Temporomandibular joint), TMD (Temporomandibular disorder). DASS-21 (Depression, Anxiety, Stress, Score-21)

Introduction

Temporomandibular joint [TMJ] is an important structure, because its function is directly related to a context that involves communication, emotional expression and feeding which is a set of factors that affect the individual's quality of life.^[1] TMJ can be painful as the result of injury, inflammatory disease, poor postures and habits or due to growth disorders.^[2] Temporomandibular disorder [TMD] is a cluster of disorders characterized by pain in preauricular area, TMJ, the masticator muscles; limitation or deviations in mandibular range of motion and clicking during mandibular function^[7]. The etiology of TMD has both structural and psychological concepts.^[27]

The prevalence of TMD in general population is 40% to 60%.^[3,4] Individuals with low self esteem are more likely to suffer from TMD^[4]; psychological and emotional factors are clearly involved in the development of the disorder.^[5,6] High incidence of exposure to stressful life events and elevated levels of anxiety and stress-related somatic symptoms have been reported in TMD patients^[10]. Moreover, in the school environment, anxiety is a sufficiently interesting aspect of study, as it may influence student performance. It involves aspects that are related to identification of the sources that cause tension in students, what its effect on learning is, which students are most affected, and the forms of treatment.^{[12][18][17]}

The Fonseca's questionnaire follows the characteristics of a multidimensional evaluation. It is composed of 10 questions, which include checking for the presence of pain in temporomandibular joint, head, back, and while chewing, parafunctional habits, movement limitations, joint clicking, perception of malocclusion, and sensation of emotional stress.^[25] The Depression, Anxiety, and Stress Scale – 21 Items (DASS-21) is set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress^[11]. The evaluation of TMD based on psychological factors has been considered important. There have been few reports of the same in population-based studies. In this study, we have performed a questionnaire survey to find out the association between TMD and psychological distress.

Methodology:

The study was a cross sectional, descriptive type of survey carried out among various higher secondary schools. The study population comprised various higher secondary school students in Surat. Inclusion criteria were those participants age group in the range of 16-18 yrs Willingness of participation, higher secondary student's Age group in the range of 16 – 18 years, Male and Female students both are included and Parents who allow and signed the informed consent form. Any known neuro-muscular disorder, musculoskeletal disorder, recent dental surgery Orofacial abnormalities, previous orthodontic treatment and those unwilling/unable to give written informed consent were excluded from the study. The Study duration was 6 months (OCTOBER 2018-APRIL 2019).

Ethical clearance was taken from institutional ethical committee. Formal permission was obtained from the principal of each school Higher secondary students were selected for the study. The very next day consent form was collected and demographic sheets were given to the students. On this basis, students were preliminary screened for inclusion and exclusion criteria. Screenings of around 299 students were done among which only 279 students screened according to the inclusion criteria. On that day itself after screening, Fonseca Anamnestic Index Questionnaire was administered. These questions were about TMJ pain along with its signs and symptoms. For each question the students have to choose one answer that best describes its symptoms. Then the total score of these questions was calculated for each student. On the 3rd day, DASS-21 scale was administered to evaluate psychological distress for each student who had TMJ disorder and total score was taken for the same. Lastly, DASS-21 scale score of each student was correlated with Fonseca Anamnestic Index score of relevant student.

Results:

Statistical analysis was done using SPSS version 16 software. This study included Age, Gender, Fonseca Anamnestic Index and DASS-21 as quantitative variables. Shapiro-WILK test was applied to check the normality of data. All quantitative data of this study follow the normality ($p > 0.05$). Descriptive statistics was calculated for Age, Gender, Fonseca Anamnestic Index and DASS-21. Pearson Correlation test was used to analyze association between TMD and Psychological distress (Stress, Anxiety, and Depression) between Group A (SCIENCE) and Group B (COMMERCE). Confidence interval was kept 95% and the level of significance for all statistical data was set $\alpha = 0.05$. The baseline characteristics were similar between groups. All the parameters showed no significant difference ($P > 0.05$).

TABLE 1 Descriptive Statistic of Group A (SCIENCE)

	Age	Fonseca (TMD)	Stress	Anxiety	Depression
Mean	16.29	31.06667	17.18667	16.84	15.57333
Standard Error	0.04874	1.70444	0.81597	0.760847	0.800578
Median	16	32.5	20	20	18
Mode	16	0	22	24	0
Standard Deviation	0.596935	20.87504	9.993546	9.318438	9.805044
Minimum	16	0	0	0	0
Maximum	17	70	38	34	36

TABLE 2: Descriptive Statistic of Group B (COMMERCE)

	Age	Fonseca (TMD)	Stress	Anxiety	Depression
Mean	16.79	8.255034	9.167785	7.14094	5.114094
Standard Error	0.044947	0.723598	0.638876	0.632357	0.502265
Median	17	5	8	6	4
Mode	17	0	0	0	0
Standard Deviation	0.548649	8.832644	7.798478	7.718896	6.130925

Deviation					
Minimum	16	0	0	0	0
Maximum	18	40	34	30	32

TABLE 3: Correlation Summary for Group A

DASS-21	Correlation Co-efficient (r)	p value
Stress	0.736	0.01
Anxiety	0.744	0.01
Depression	0.759	0.04

- There is positive correlation between TMD and Stress ($r=0.736$), Anxiety ($r=0.744$), Depression ($r=0.759$) (P value <0.05) in Science students.

TABLE 4: Correlation Summary for Group B

DASS-21	Correlation Co-efficient (r)	p value
Stress	0.472	0.02
Anxiety	0.532	0.02
Depression	0.381	0.04

- There is positive correlation between TMD and Stress ($r=0.472$), Anxiety ($r=0.532$), Depression ($r=0.381$) (P value <0.05) in Commerce students

DISCUSSION

This study aimed to find out the association between TMD and psychological distress among higher secondary students using Fonseca's questionnaire and DASS-21 scale. In the present study, we tried to explore the psychological aspect of TMD and considerable differences existed in the levels of stress, depression and anxiety between the TMD subjects.

- Our study includes a sample of 279 students [139 in science and 140 in commerce]. There were 2 groups of students, group A represents science field and group B represents commerce field. The result showed that there was high prevalence of TMD in group A students than group B. The mean age of Group A is 16.29 years (SD: 0.59). Minimum age in Group A is 16 years and maximum age is 17 years. The mean score of Fonseca in Group A is 31.06 (SD: 20.87). Minimum score of Fonseca is 0 and Maximum score is 70 in Group A. The mean score of Stress, Anxiety and Depression is 17.18 (SD: 9.99), 16.84 (SD: 9.31) and 15.57 (SD: 9.80) respectively in Group A. Minimum score of Stress, Anxiety and Depression is 0 in Group A. Maximum score of Stress, Anxiety and Depression is 38, 34 and 36 respectively in Group A. (Table:1)

The mean age of Group B is 16.79 years (SD: 0.54). Minimum age in Group B is 16 years and maximum age is 18 years. The mean score of Fonseca in Group B is 8.25 (SD: 8.83). Minimum score of Fonseca is 0 and Maximum score is 40 in Group B. The mean score of Stress, Anxiety and Depression is 9.16 (SD: 7.79), 7.14 (SD: 7.71) and 5.11 (SD: 6.13) respectively in Group B. Minimum score of Stress, Anxiety and Depression is 0 in Group B. Maximum score of Stress, Anxiety and Depression is 34, 30 and 32 respectively in Group B. (Table :2)

The present study showed that there is a significant difference in group A and group B. There was high prevalence of TMD in group A whereas in group B, there are chances that this group of students may develop symptoms of TMD. Psychological distress in both the groups correlates with TMD.

Supportive to our study, Bonjardim LR, et al stated that psychological distress plays an important role in the etiology and maintenance of TMD and is believed to predispose the individual to chronicity. ^[20] Psychological factors provided some interesting data in our study. The questionnaire that we administered, anxiety levels provided significant results in relation to TMD. In TMD patients, a high incidence of exposure to stressful life event, elevated levels of anxiety and stress-related somatic symptoms have been reported.

Increased levels of emotional stress influences masticatory function. The emotional centers of the brain influence muscle function, including the masticatory muscles. ^[21] Students from every educational institution experiences stress during the learning process. Modifications can occur in the muscle activities when an individual is experiencing a higher emotional state, e.g. frightened, fear, frustrated, or angry. ^[9] Beaton et al and Niemi et al reported the stress symptoms among the TMD patients when compared to healthy subjects. ^[22] In our study, stress symptom was found in TMD patients.

VIVIANE GONTIJO AUGUSTO et al, stated that there is an association between TMD and parafunctional habits such as perceived stress and CMD. ^[19] Vimpari SS, et al stated that although the association between psychological factors and TMD is inconsistent in the literature, there is biological possibility for this association. ^[23] In our study there was an association between TMD and psychological distress.

In the general population, moderate and severe depressions are very common psychological disorders. ^[20] Some studies have reported elevated level of depression whereas others have found no differences between TMD patient and normal controls. ^[19] Our study was in agreement with Bonjardim et al as he found a statistically significant association between TMD degree and HADSa (15.20%) and 1.38% of subjects presented with mild and moderate/severe anxiety symptoms but there was no association between TMD degree and HADSd (9.67%) depression. ^[24] Our study shows moderate/severe depression symptoms.

The correlation co-efficient between TMD and Stress ($r= 0.736$), Anxiety ($r= 0.744$) and Depression ($r= 0.759$) in Group A students (Table: 3). The correlation co-efficient between TMD and Stress ($r= 0.472$), Anxiety ($r= 0.532$), Depression ($r= 0.381$) in Group B students (Table: 4). Both groups showed a high correlation between TMD and Psychological distress with the significance of ($p<0.05$).

In present study, science students are more likely to be affected by TMD than commerce students. It can be because science student's experience more study and work load which let the students under greater stress and anxiety.

Limitation:

- 1) We did not find the difference of Prevalence of TMD between male and female.
- 2) Under or over reporting of behavior might have affected the results. Due to social stigma, many students might have hidden the real facts and their feelings.

Conclusion

There was an influence of psychological distress, such as Stress, Anxiety and Depression on TMD. There was greater Prevalence of signs and symptoms of TMD in science students than Commerce students. According to the result, it was concluded that there is an association between TMD and Psychological distress.

AUTHOR CONTRIBUTIONS

All the authors listed in the manuscript contributed sufficiently to qualify for authorship. The design and concept was given by Sneha Somarajan. The statistical analysis was mainly done by Akshata Chaphekar. The major part of data collection by interns and manuscript was done by Sneha Somarajan, other authors also contributed.

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