Original research article:

Assessment of prevalence and severity of Temporomandibular Disorders of Thanjavur Medical undergraduate students in relation to history and treatment using Fonseca's Questiionnaire

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Abstract:

Aims and objectives: This study evaluated the prevalence and severity of TMD in undergraduate medical students of Thanjavur district in relation to medical history and dental treatment with the help of Fonseca's questionnaire.

Materials and Methods: A total of 300 subjects participated, out of which 93 were males and 207 were females with an average age group of 21 years. The Fonseca questionnaire and Anamnestic Index were used as assessing tool to evaluate the prevalence and severity of TMD respectively.

Results: The prevalence of TMD based on Fonseca anamnestic index, results showed 66% without dysfunction, whereas 34% with dysfunction (29% mild, 4.3% moderate and 0.6% severe). Highest problem noted was TMJ clicking of 14% for 'yes' and clenching of 20.3% for 'sometimes'. Least one was earache of1.3% for 'yes' and hard to open mouth of 1% for 'sometimes' response.

Conclusions: The prevalence of TMD in Thanjavur students was found to be mild and association between medical history of psychological stress, sleeping problem and dental related treatment were observed.

Keywords: Temporomandibular disorder, Fonseca question, Anamnestic index

Introduction:

Temporomandibular disorders (TMD) is defined as subgroup of painful orofacial disorders,involving complaints of pain on the temporomandibular joint region and fatigue of the cranio- cervico- facial muscles, especially masticatory muscles, limitation of mandible movement and the presence of articular clicking sound [1]. The etiology of TMDs has multifactorial causes related to emotional stress, traumatic injury, occlusal interference, malpositioning or loss of teeth, masticatory muscle dysfunction, postural changes, extrinsic and intrinsic changes of TMJ structures or a combination of such factors [2]. Prosthetic rehabilitation, Orthognathic surgery, Orthodontic treatment and mandibular fractures have been associated with TMJ changes and worsening of existing TMD [3]. Several studies have been reported that psycho- emotional factors such as depression, anxiety and stress are related to TMD [4, 5].

The prevalence of TMD ranges from 20% to 50%. The variability in prevalence may be attributed to different racial population, sampling design and criteria and methods used for collecting data [1,6-8]. Screening for TMD in a population is a challenge for clinicians and researchers and several TMD assessment tools have been proposed in the literature.

In the year 1994, Fonseca's proposed questionnaire to classify Temporomandibular disorder severity in the study population. His questionnaire is highly efficient in obtaining epidemiological data and follows the characteristics of a multidimensional evaluation. It is composed of ten questions, which include checking the presence of pain in Temporomandibular joint, head, back, while chewing, parafunctional habits, movement limitations, joint clicking, perception of malocclusion and sensation of emotional stress. The Fonseca's questionnaire contains an anamnestic index, and the participants were classified accordingly as having mild TMD, moderate TMD, severe TMD or no- TMD [9].

This study evaluated the prevalence and severity of TMD in undergraduate medical students of Thanjavur district in relation to medical history and dental treatment with the help of Fonseca's questionnaire.

Materials and methods:

This study was approved by institutional review board of Thanjavur medical college and hospital. The study was carried out from October 2019 to December 2019

A total of 481 undergraduate medical students from Thanjavur medical college were selected. Out of which 300 given written consent and willing to participate in this study. Male subject were 93 and female were 207. The age range of study participants was 18-25 years. The selected groups were given Fonseca's questionnaire with proper instruction to fill the form and asked to return the filled form to researchers. The subjects with previous history of orthodontic treatment, musculoskeletal problem, orofacial pain, systemic disease, being under Temporomandibular disorder treatment were excluded from this study. Additionally participants demographic details, medical, dental and TMJ history were collected along with the questionnaire form.

The study participants were informed that the ten questions should be answered with "yes", "no" and "sometimes" and that only one answer should be marked for each question. There was no time limit given to complete the form, by that way, there would be no influence to answer the questions.

For data analysis, the answers "yes", "no" and "sometimes" from each questionnaire were tallied and the total was multiplied by the value attributed to each answer: ten, zero and five respectively. The final value was compared to the clinical index and the participants were classified per TMD degree, (Table 2).

Results were analysed using the frequency distribution of the questionnaire answers according to the anamnestic index. Statistical analysis was performed using SPSS for windows release 14.0 (SPSS Inc., Chicago, IL, USA) with a 5% level of significance. Pearsosn Chi- Square was used to examine the correlation between various dental treatments and TMJ dysfunction.

Results:

A total of 300 questionnaires were completed by the participants, which included 93(31%) men and 207(69%) women. The mean age of the subjects was 19.53±1.76 years (Table 1). The results regarding medical history and the habits of the subjects are presented in Figure 1. Based on these results, 46% of the subjects had psychological stress, 39% had an eye sight problem, 53% had sleeping problems, 26% had an alcohol drinking habit and 28% had a smoking habit.

The results of the TMJ – related Fonseca questions are shown in Table 2. The most frequently reported problem was TMJ clicking while chewing or opening mouth with 14% for the 'yes' and clenching or grinding with 20.3% for the 'sometimes' responses. The least frequently noted problem was earaches or pain in cranio-mandibular joints with 1.3% for the 'yes' and earaches and hard to open mouth with 1% for the 'sometimes' responses.

Table 3 shows the results regarding TMD according to Fonseca anamnestic index. It was found that 66% had no dysfunction, whereas 29% had mild dysfunction, 4.3% had moderate dysfunction and 0.6% had severe dysfunction.

The details regarding dental treatments are shown in Table 4. Mild and moderate TMJ dysfunctions subjects had received dental treatment including, restoration, extraction, root canal treatment and orthodontic treatment. However participants with severe TMJ dysfunction had only received restoration. Significant correlation of P = 0.003 between the various dental treatments and TMJ dysfunction was found in this study. The dental history and related problems are shown Figure 2.

It was found that 54% of the subjects reported history of dental treatment. Descending order of dental related problems observed in this study were dentinal hypersensitivity 27%, grinding teeth 22%, malocclusion 19%, and mouth breathing 13%.

The result of TMJ dysfunction in various clinical conditions was shown in Table 5. Mild dysfunction was observed in higher numbers than with moderate and severe TMJ dysfunction in each clinical condition. The frequency order of all clinical conditions was 'no', 'sometimes' and 'yes' and there was a statistically significant difference among these three clinical conditions were noticed at P < 0.01.

Table 1. Subject characteristics				
	Subject details		Frequency (%)	
Total subjects			300(100)	
Male			93(31)	
Female			207(69)	
Age				
Mean ± SD			19.53 ± 1.76	
Range			18- 25 Years	

Table 2. Results of Fonseca questions					
SN		Fonseca Questions		Yes n (%)	Sometimes n(%)	No n(%)
1		Is it hard for you to open your mouth?		7(2.3)	3(1)	290(96.6)
2		Is it hard for you to move your mandible from side to side?		5(1.6)	5(1.6)	290(96.6)
3		Do you get tried/ muscular pain while chewing?		6(2)	10(3.3)	284(94.6)
4		Do you have frequent headaches?		9(3)	21(7)	270(90)
5		Do you have pain on the neck or neck stiffness?		9(3)	7(2.3)	284(94.6)
6		Do you have earaches or pain in cranio- mandibular joints?		4(1.3)	3(1)	293(97.6)
7		Have you noticed any TMJ clicking while chewing or when you open your mouth?	42(14)	37(12.3)	22173.6)
8		Do you clench or grind your teeth?		25(8.3)	61(20.3)	214(71.3)
9		Do you feel your teeth do not articulate well?		11(3.6)	14(4.6)	27591.6)
10		Do you consider yourself a tense (nervous) person?		17(5.6)	22(7.3)	261(87)
TMJ: temporomandibular joint					

Table 3. Results of temporomandibular disorder according to Fonseca's Anamnestic Index

TMJ Dysfunction		Number(%)	Mean age ± SD	
Without Dysfunction		198(66%)	18.31±1.59	
Mild Dysfunction		87(29%)	19.22±1.33	
Moderate Dysfunction		13(4.3%)	20.76±1.00	
Severe Dysfunction		2(0.6%)	20.91±1.22	

Table 4. Details of Dental treatments history of the subjects

TMJ Dysfunction	Restoration	Extraction	Root canal treatment	Scaling	Orthodontic treatment	Prosthetic treatment	Pearson Chi- Square (P-value)
Mild Dysfunction	19	9	11	2	12	1	0.003
Moderate Dysfunction	12	2	6	1	6	1	
Severe Dysfunction	2	0	0	0	0	0	

| Table 5. Results of temporomandibular dysfunction in various clinical conditions							
Conditions			Without dyfunction	Mild dysfunction	Moderate dysfunction	Severe dysfunction	P value
			n(%)	n(%)	n(%)	n(%)	
Hard to open mouth							< 0.001
Yes			4	1	2	0	
Sometimes			1	1	1	0	
No			193	85	10	2	
Hard to move mandible laterally							< 0.001
Yes			3	1	1	0	
Sometimes			2	1	1	1	
No			193	85	11	1	
Muscle pain or tired while chewing							< 0.001
Yes			3	2	1	0	
Sometimes			6	2	1	1	
No			189	83	11	1	
Frequent headache							< 0.001
Yes			5	2	1	1	
Sometimes			14	5	1	1	
No			179	80	11	0	
Neck stiffness							< 0.001
Yes			6	1	1	1	
Sometimes			4	1	1	1	
No			188	85	11	0	
Earache or TMJ joint pain							< 0.001
Yes			2	1	1	0	
Sometimes			1	1	0	1	
No			195	85	12	1	
TMJ cliking while chewing							< 0.001
Yes			32	8	2	0	
Sometimes			24	7	5	1	
No			142	72	6	1	
Grinding teeth							< 0.001
Yes			15	6	3	1	
Sometimes			31	24	5	1	
No			152	57	5	0	
Teeth not articulating well							< 0.001
Yes			6	3	1	1	
Sometimes			6	6	2	0	
No			186	78	10	1	
Nervous/ tense person							< 0.001
Yes			10	5	1	1	
Sometimes			10	10	1	1	
No			178	72	11	0	
TMJ: temporomandibular joint							
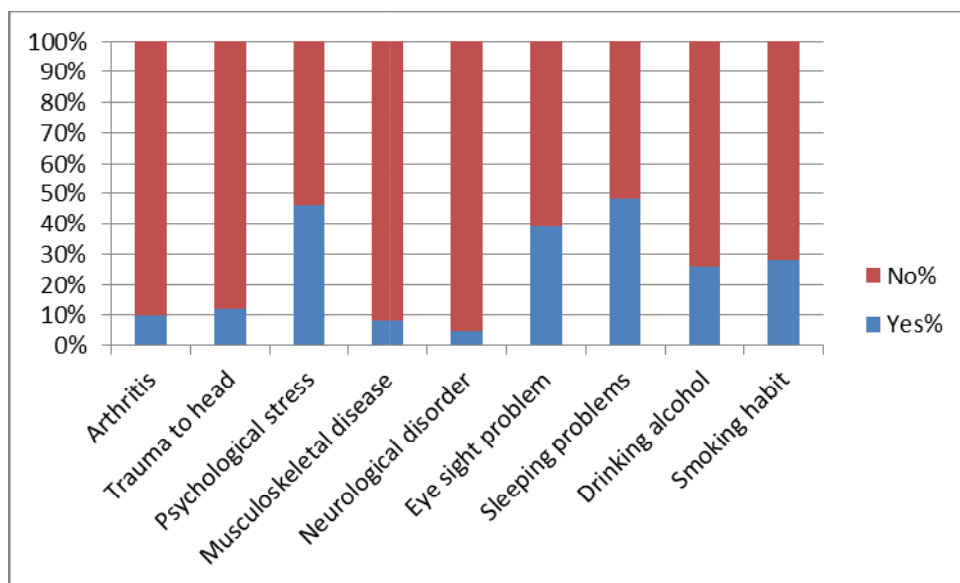
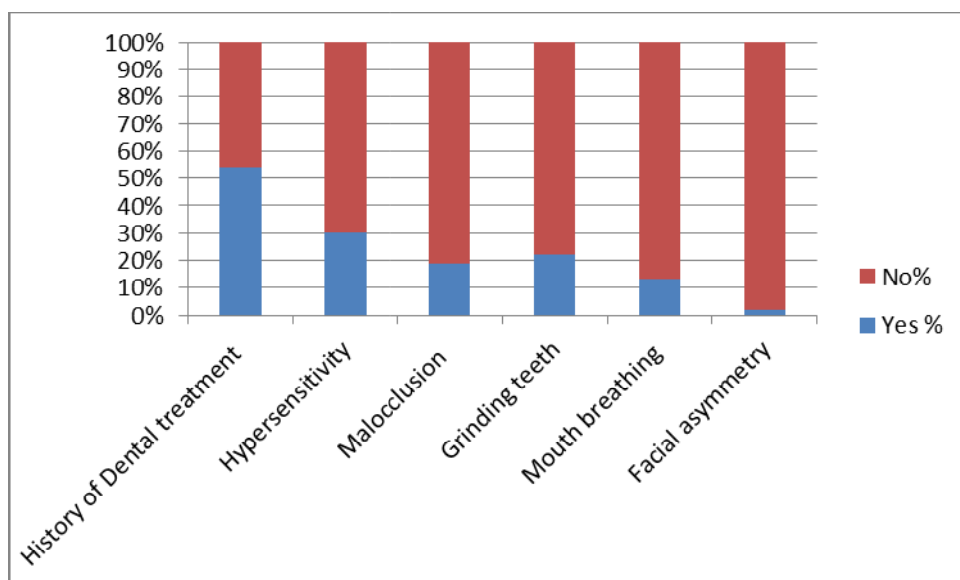Fig1. Medical history and habits of the subjects (expressed in percentages)

Fig 2. Dental history and related problems of the subjects (expressed in percentages)

Discussion

The prevalence of TMD based on Fonseca anamnestic index found in this study was 34% which was lower than that reported by other studies, such as Pakistani students (92.2%)[10], Saudi students (46.8%)[11], Brazilian students (53.2%)[1], and Taiwanese students (42.9%)[12]. But, our study result was consistent with findings of Rokaya et al of 31% [13].

Bonjardim et al and Pesqueira et al were found significant association of TMD signs and symptoms with mental anxiety and stress. Moreover, they mentioned that 42% of subjects had psychological stress and 33% of subjects with TMD had a history of mental anxiety. Our study findings of psychological stress 46% was higher than that

of Bonjardim et al and Pesqueria et al[2,5]. Habib et al found psychological stress of 30.5% in Saudi population, which was lower than our study findings [11].

In the present study, TMJ cliking and grinding were observed in highest percentage of 14% and 20.3% respectively. Bonjardim et al reported that most prevalent subjective symptom was TMJ sound of 26.72% followed by headache 21.65%. Conti et al also found TMJ sound to be the most common symptom followed by headache[14].

In this study, significant correlation between TMD and restoration of teeth was found. Becker observed that significant scientific evidence exists regarding occlusal etiological factors for TMD. Improper or incorrect restoration leads to disorders of masticatory muscles, orofacial structures and TMD. In order to maintain sound TMJ and proper occlusion, premature occlusal interference should be corrected as early as possible [15].

Chi et al and Park et al found an association between dental problems and TMD, which was consistent with our study findings[16,17]. Ebrahimi et al found that prevalent predisposing cause for TMD was clenching, bruxism and premature contact in protrusive movement[8] . Our study showed 22% of subject had habit of grinding teeth at night time.

Limitations found in this study are sampling method, brief questionnaire used and participants from small region. This study only provides information regarding the prevalence and severity of TMD in medical students. Prospective long term studies should be conducted to investigate the association of medical and dental history and related problems of large group of population in different region.

Conclusion

Fonseca's questionnaire and anamnestic index used in this study, served as important assessing tools for determining TMD. The prevalence of TMD in this study was lower, but some association with medical history and dental treatment were strongly found. So, early diagnose of TMD will prevent future complications.

References:

1. Nomura K, Vitti M, Oliveria AS, Chaves TC, Semprini M, Siessere S.Use of the Fonseca's questionnaire to assess the prevalence and severity of temporomandibular disorders in Brazilian dental undergraduates. Braz Dent J 2007;18: 163-7.

2. Bonjardim LR, Gaviao MB, Pereira LJ, Castelo PM. Anxiety and depression in adolescents and their relationship with signs and symptoms of temporomandibular disorders. Int J Prosthodont 2005; 18: 347-52

3. Goldstein BH. Temporomandibular disorders: a review of current understanding. Oral Surg Oral Med Oral Pathol Oral Radio Endod 1999; 88: 379-85.

4. Pallegama RW, Ranasinghe AW, Weerasinghe VS, Sitheeque. Anxiety and personality traits in patients with muscle related temporomandibular disorders. J Oral Rehabil 2005; 32: 701-707.

5. Pesqueira AA, Zuim PR, Monteiro DR, Ribeiro Pdo P, Garcia AR. Relationship between psychological factors and symptoms of TMD in university undergraduate students. Acta Odontol Latinoam 2010; 23: 182-7.

6. Lee JY, Kim YK, Kim SG, Yun PY. Evaluation of Korean teenagers with temporomandibular joint disorders. J Korean Assoc Oral Maxillofac Surg 2013; 39: 231-237.

7. Modi P, Shaikh SS, Munde A. A cross sectional study of prevalence of temporomandibular disorders in university students. Int J Sci Res Publ 2012; 2(9): 1-3.

8. Ebrahimi M, Dashti H, Mehrabkhani M, Arghavani M, Daneshvar- Mozafari A. Temporomandibular disorders and related factors in a group of Iranian adolescents: A cross sectional survey. J Dent Res Dent Clin Dent Prospect 2011; 5: 123-7.

9. Da Fonseca DM, Bonfante G, Valle AL, de Freitas SFT. Diagnostico pela anamneses da disfuncao craniomandibular. Rev Gauch de Odontol 1994; 4: 23-32.

10. Wahid A, Mian FI, Razzaq A, Bokhari SAH, Kaukab T, Iftikhar A. Prevalence and severity of temporomandibular disorder in undergraduate medical students using Fonseca's questionnaire. Pakistan Oral Dent J 2014; 31: 38-41.

11. Habib SR, Al Rifaiy MQ, Awan KH, Alsaif A, Alshalan A, Altokais Y. Prevalence and severity of temporomandibular disorders among university students in Riyadh. Saudi Dent J 2015;27:125-30.

12. Shiau YY, Chang C. An epidemiological study of temporomandibular disorders in university students of Taiwan. Community Dent Oral Epidemiol 1992; 20: 43-7.

13. Dinesh Rokaya, Kanokwan Suttagul, Shraddha Joshi, Bishwa Prakash Bhattarai, Pravin Kumar Shah Shantanu Dixit. An epidemiological study on the prevalence of temporomandibular disorder and associated history and problems in Nepalese subjects. J Dent Anesth Pain Med 2018; 18(1): 27-33.

14. Conti A, Freitas M, Conti P, Henriques J, Janson G. Relationship between signs and symptoms of temporomandibular disorders and orthodontic treatment: A cross- sectional study. Angle Orthod 2003; 73: 411-7.

15. Becker IM. Occlusion as a causative factor in TMD. Scientific basis to occlusal therapy. N Y State Dent J 1995; 61: 54-7.

16. Chi SI, Kim HJ, Seo KS, Lee JH, Chang J. Local anesthesia of the temporomandibular joint to reduce pain during mouth opening for dental treatment in a patient with spinal muscular atrophy. J Dent Anesth Pain Med 2016; 16: 137-40.

17. Park KS, Lee CH, Lee JW. Use of a botulinum toxin A in dentistry and oral and maxillofacial surgery. J Dent Anesth Pain Med 2016; 16: 151-7.