RESEARCH ARTICLE

KAP Survey – Prevalence and Severity of Temporomandibular Disorders in Chennai Population

Swathi Shammi[1,], Hemavathy Muralidoss[2], Pradeep.D[3]
[1]Postgraduate Student, Department of Oral and Maxillofacial Surgery,   Saveetha Dental College, Saveetha University, Chennai.
[2]Department of Oral and Maxillofacial Surgery, Saveetha Dental College, Saveetha University, Chennai.
[3]Department of Oral and Maxillofacial Surgery, Saveetha Dental College, Saveetha University, Chennai

ABSTRACT

The aim of this study is to determine the prevalence of temporomandibular disorders among Chennai population and its severity. This study was carried out between June 2018 to December 2018 and the study sample consisted of 475 patients   who visited the Saveetha Dental College OPD. The questionnaire developed by Fonseca was used to evaluate the degree of TMD in the participants. A total of 475 patients participated in the study of which 223 were females, 252 were males. The age distribution was between 15 – 70 years. Regarding TMD alone, 25% of the subjects had no disorder or some degree of disorder, 62% had mild TMD, 11% moderate and 2% severe TMD.In the present study, over 50% of the population had TMD. Women (81.6%) were the more affected than men (68.65%). Considering only severe TMD, women were more affected than men. The high prevalence of TMD in women may be related to their different physiological characteristics, such as regular hormonal variations, muscle structures and different characteristics of the connective tissue.

INTRODUCTION

Temporomandibular disorders (TMD) is a collective term that defines a group of painful orofacial disorders which involves pain on the temporomandibular joint (TMJ) region and fatigue of the craniocervicofacial muscles, especially the masticatory muscles, limitation of mandible movement such as protrusion, retrusion and lateral excursion and presence of articular clicking.

The International Association for the Study of Pain (IASP) defines pain as an unpleasant sensorial and emotional experience, associated to real or potential injuries. This concept admits the possibility of non–existence of a direct relationship between pain and tissue damage. It also emphasizes the subjectivity in the interpretation of the painful phenomenon. TMD is acknowledged as the main cause of non–dental orofacial pain. Pain is generally located on the masticatory muscles, in the pre–auricular area and TMJs [1].

The etiology of TMDs is linked to multiple factors. It includes   traumatic injury to the TMJ, immune-mediated systemic disease, neoplastic growths, emotional stress, occlusal discrepancies, malpositioned teeth or loss of teeth, postural changes, dysfunctions of the masticatory muscles and adjacent structures, extrinsic and intrinsic changes of TMJ structure, nonfunctional movements of the mandible (bruxism), tooth clenching habits, or a combination of such factors [1,3,4,5,6]. Prosthodontic rehabilitation, orthodontic treatment, orthognathic surgery and mandibular fractures have been associated with TMJ changes and also worsening the existing TMD [7]. Loading, altered jaw position, and mechanical stress in response to the aforementioned treatments induce morphological changes in the TMJ, due to its inherent adaptive capacity [8]

The prevalence of TMDs ranges from 20 - 50%. The variability in prevalence is attributed to differences in the race of the population, in the sampling design and criteria, and in the methods used for collecting information [9,10,11,12,13,14,15,16] Screening for TMDs in a large population is a challenge for

. **Contact**: Swathi Shammi ✉ Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences
✉ swathisshammi@gmail.comTel: +91 7358061062

researchers and clinicians, and several TMD assessment tools have been proposed in the literature. However, no universal diagnostic criteria has yet been established. In response to this need for a universally accepted TMD assessment tool,[17] proposed the RDC/TMDs, which have since been used in several clinical and epidemiological studies. Most recently,[18] proposed new comprehensive version of the RDC/TMDs, known as the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD). They claim that the DC/TMD includes a valid and reliable screening questionnaire, and also diagnostic algorithms for the most common pain-related TMDs. Despite their advantages, the RDC/TMD and DC/TMD are quite cumbersome assessment tools in that they require the individual to be present in order to render a TMD diagnosis, and they are difficult to use on large samples.

A self-administered questionnaire that includes the Fonseca's anamnestic index (FAI) has been proposed as a low-cost, easily applied alternative TMD assessment tool for the non-patient population[19] .The use of FAI for detecting TMD signs and symptoms provides the advantage of being easily used by either general practitioners or epidemiologists. Thus, the FAI shall serve as a preliminary TMD screening tool. After the affected population is identified, a more thorough investigation can be conducted, which will include a complete clinical examination and use of diagnostic instruments to confirm the diagnosis. In a literature review regarding the reliability of using a questionnaire for assessing the severity of TMDs, [20] recommended the use of FAI because of its simplicity, speed, and cost effectiveness. The questionnaire also provides a severity index with less influence from the examiner and less variability in the measures [13,14]. Fonseca's questionnaire follows the characteristics of a multidimensional evaluation of TMD. It is composed of 10 questions that screen for the presence of pain in the TMJ, head, and back; pain while chewing; parafunctional habit; limitation of jaw movements; joint clicking; perception of malocclusion; and sensation of emotional stress [19]

Psyhcological factors are known to play a role in the etiology and persistence of TMDs. In particular, a high incidence of exposure to stressful life events and elevated levels of anxiety and stress-related symptoms have been reported in TMD patients [21,22]. Anxiety, stress and depression are the most frequent clinical disorders in the general population and are highly present among university students. The repercussions of academic stress on the health of university students have been reported in the literature [23].

The aim of this study was to use a cross-sectional epidemiological survey to investigate the prevalence and severity of TMDs in Chennai population using Fonseca's questionnaire. The role of relevant medical and dental histories in the assessment of TMD was also investigated. We hypothesized that using the FAI to characterize TMJ dysfunction would be helpful in furthering the understanding of TMD prevalence among Chennai population and would provide information important for the early diagnosis and management of TMDs.

METHODS

Subject selection

This study was carried out between June 2018 to December 2018 and the study sample consisted of 475 patients (252 males, 223 females, age range 15 -70) who visited the Saveetha Dental College OPD. Ethical approval was obtained, and the subjects were required to sign an informed consent before their participation in the study. Information about TMDs was given to all the participating subjects. The subjects were divided into 2 groups: group A (less than 35 years of age) and group B (more than 35 years of age).

Questionnaire

The questionnaire developed by Fonseca [14,17] was used to evaluate the degree of TMD in the participants. The questionnaire is framed of ten questions, evaluating for the presence of pain in TMJ, head, and while chewing, parafunctional habits, limitation of movements, joint clicking, perception of malocclusion, and emotional stress. The volunteers answered with "yes," "no," and "sometimes" and only one answer to be marked for each question as instructed.

DATA ANALYSIS

The Fonseca's questionnaire contains an anamnestic index, and the volunteers were classified accordingly as having mild TMD, moderate TMD, severe TMD or no–TMD. The authors obtained 95% reliability and good correlation with Helkimo's index (r=0.6169; p<0.05). For analysis, the answers "yes", "no" and "sometimes" from each questionnaire were tallied and the total was multiplied by the value attributed to each answer: "10", "5", "0", respectively. The final value was compared to the clinical index and the volunteers were classified per TMD degree

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 craniomandibular joints?			
7- Have you noticed any TMJ clickingwhile chewing or when you open your mouth?			
8- Do you clench or grind your teeth ?			
9- Do your feel your teeth do not articulate well?			
10- Do you consider yourself a tense (nervous) person?			

Figure 1: Fonseca Questionnaire

Table 1: Categorization of TMD disorder

Score	Interpretation
0-15	No TMD
20-40	Mild TMD
45-65	Moderate TMD
70-100	Severe TMD

The results were analysed using the frequency distribution of the data obtained. Of the 475 participants, 216 participants were less than 35 years of age and 259 participants were more than 35 years of age. Among the 216 participants less than 35 years of age, 124 were male and 92 were female. Similarly, among the 259 participants above 35 years of age, 128 were male and 131 were female.
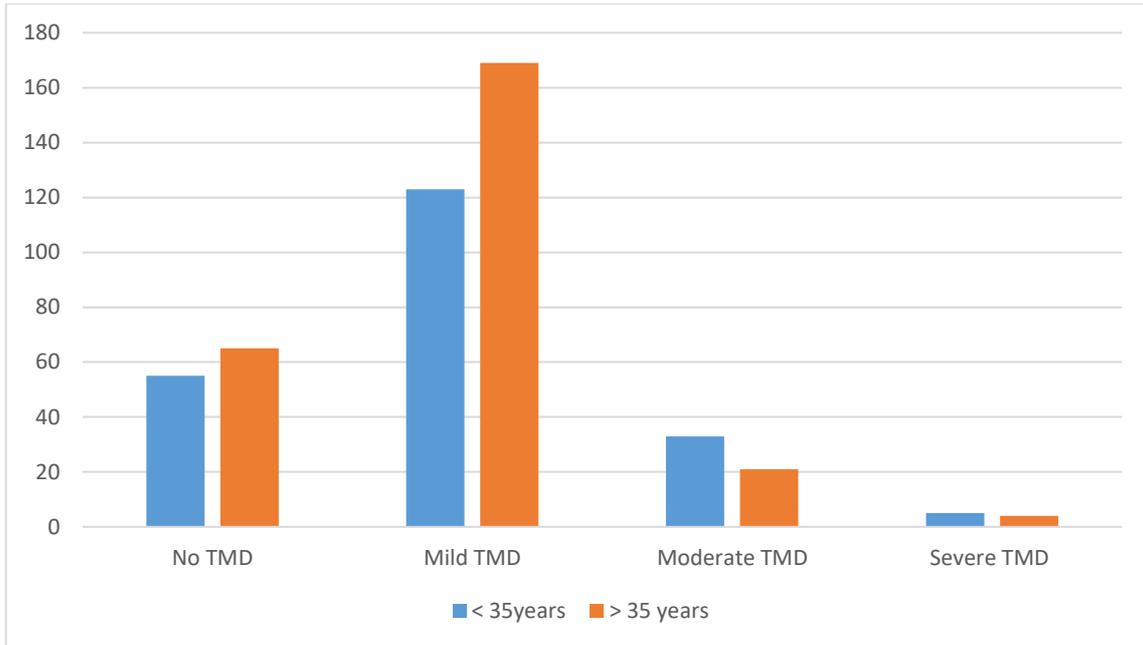
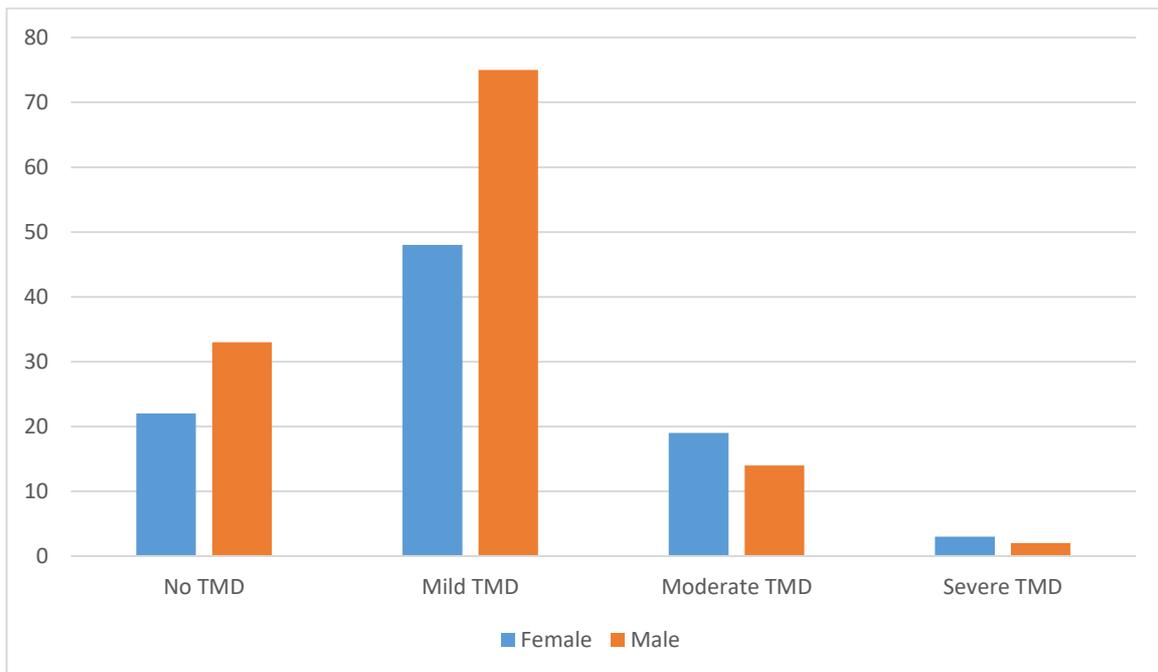**Figure 2: Age Distribution according to TMD severity**

Figure 3: Gender distribution according to TMD severity in patients less than 35 years of age
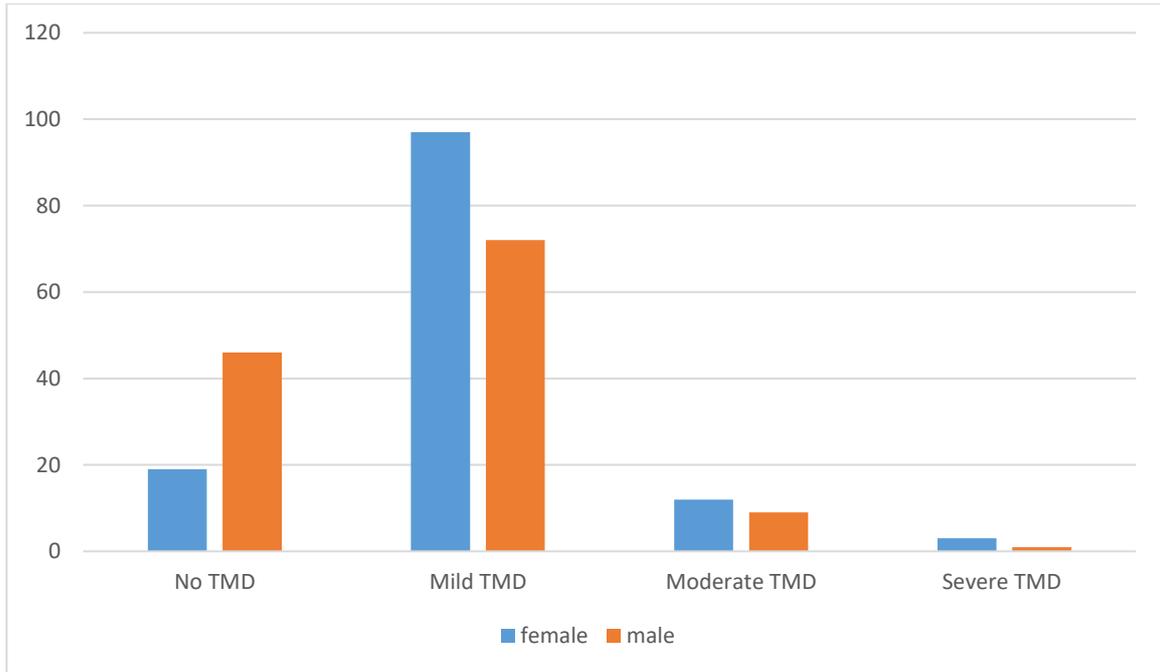
Figure 4: Gender distribution according to TMD severity in patients above 35 years of age

Table 2: Distribution of Temporomandibular Disorders presence in relation to age

TMD	Age (years)		Total
	<35	>35	
	n (%)	n (%)	n (%)
Free	55 (25.5)	65 (25.0)	120 (25.3)
Mild	123 (56.9)	169 (65.4)	292 (61.5)
Moderate	33 (15.3)	21 (8.1)	54 (11.3)
Severe	5 (2.3)	4 (1.5)	9 (1.9)
Total	216 (100.0)	259 (100.0)	475 (100.0)

Table 3: Distribution of Temporomandibular Disorders presence in relation to gender

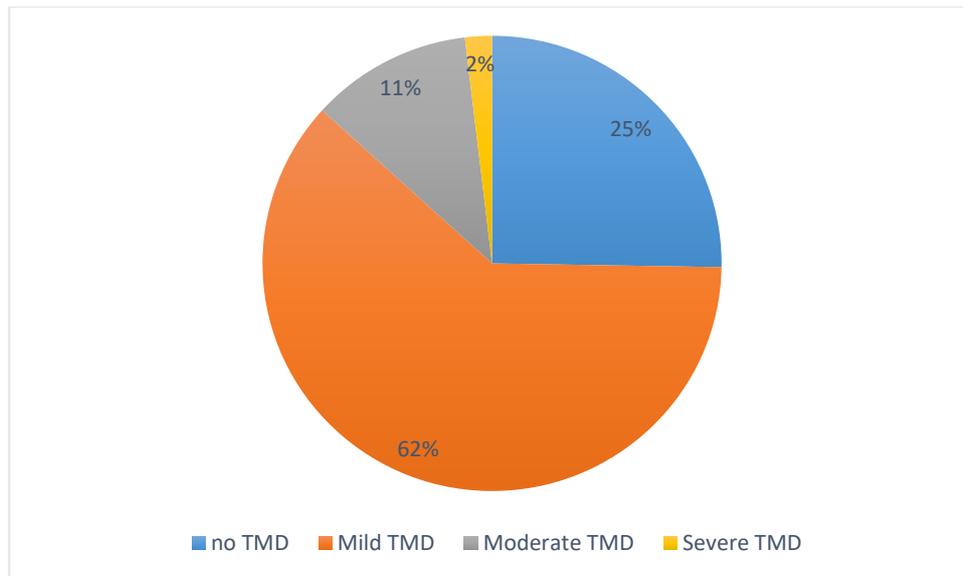| TMD	Gender*		Total
	Female	Male	
	n (%)	n (%)	n (%)
Free	41 (18.4)	79 (31.3)	120 (25.3)
Mild	145 (65.0)	147 (58.4)	292 (61.5)
Moderate	31 (13.9)	23 (9.1)	54 (11.3)
Severe	6 (2.7)	3 (1.2)	9 (1.9)
Total	223 (100.0)	252 (100.0)	475 (100.0)

Figure 5: Categorization of TMD disorder

RESULTS

There is a smaller percentage of volunteers classified as being free of TMD (p<0.05). The percentage of volunteers classified as having mild TMD was significantly higher (p<0.05) than that of volunteers with other TMD severity level (severe, moderate and non–TMD).

Regarding TMD alone, 25% of the subjects had no disorder or some degree of disorder, 62% had mild TMD, 11% moderate and 2% severe TMD

In the present study, over 50% of the population had TMD. Women (81.6%) were the more affected than men (68.65%). Considering only severe TMD, women were more affected than men. The high prevalence of TMD in women may be related to their different physiological characteristics, such as regular hormonal variations, muscle structures and different characteristics of the connective tissue [14,24,25].

DISCUSSION

The Fonseca's questionnaire allows collecting a large quantity of information in a relatively short period and at low cost, it is easy to understand and has almost no influence from the examiner. It is also easy to understand and has almost no influence on the investigator data analyzer.

The most common symptoms elicited by the participants in this study included difficulty in mouth opening, masticatory pain, pain in the auricular region, clicking in the TMJ during chewing, or mouth opening. There was also increased the prevalence of symptoms in people who described themselves as being tense. This is of clinical significance as emotional stress is considered to be important characteristic of TMD. This finding is in accordance with the previous investigations as emotional stress influencing changes of the muscular activity and occlusion. This data corroborating the relationship between emotional stress and development of TMDs could of great importance in early diagnosis and management of these disorders.

CONCLUSION

In conclusion, a simplified anamnestic index allows identifying a TMD patient and, simultaneously, classifies the patient according to disorder severity. Public health and screening services should adopt the questionnaire, as the anamnestic index may be obtained by technical personnel, in a relatively short period and at low cost, and it has wide population coverage. With proper diagnosis and treatment, this could manage orofacial pain in a large contingent of people

REFERENCES

1. Bonjardim LR, Gavião MB, Pereira LJ, Castelo PM, Garcia RC. Signs and symptoms of temporomandibular disorders in adolescents. Brazilian Oral Research 2005;19:93–98.
2. LeResche L, Saunders K, Von Korff MR, Barlow W, Dworkin SF. Use of exogenous hormones and risk of temporomandibular disorder pain. Pain 1997;69:153–60.
3. deSantis, T.O., Motta, L.J., Gonzalez, D.A.B., Ferrari, R.A.M., Fernandes, K.P.S., de Godoy, C.H.L., Alfaya, T.A., Bussadori, S.K., 2014. Accuracy study of the main screening tools for temporomandibular disorder in children and adolescents. J. Bodyw. Mov. Ther. 18, 87–91
4. Manfredini, D., Lobbezoo, F., 1998. Relationship between temporomandibular disorders: a systematic review of literature 368 from 1998 to 2008. Oral Surg. Oral Med. Oral Pathol. Oral Radiol

5. Manfredini, D., Guarda-Nardini, L., Winocur, E., Piccotti, F, J., Lobbezoo, F., 2011. Research diagnostic criteria disorders: a systematic review of axis I. Endod. 112 (4), 453–462. [Epub 2011 Aug 11].

6. [6] Bonjardim, L.R., Gaviao, M.B., Pereira, L.J., Castelo, P.M., 2005a. Anxiety and depression in dolescents and their relationship with signs and symptoms of temporomandibular disorders. Int. J. Prosthodont. 18, 347–352.

7. Goldstein, B.H., 1999. Temporomandibular disorders: a review of current understanding. Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod. 88, 379–385.

8. Arnett, G.W., Milam, S.B., Gottesman, L., 1996.. Dentofac. Orthop. 110, 8–15.

9. Lee, J.Y., Kim, Y.K., Kim, S.G., Yun, P.Y., 2013. Evaluation of 364 Korean teenagers with temporomandibular joint Assoc. Oral Maxillofac. Surg. 39, 231–237.

10. Modi, P., Shaikh, S.S., Munde, A., 2012. A cross sectional study of temporomandibular disorders in Res. Publ. 2 (9), 1–3.

11. Ebrahimi, M., Dashti, H., Mehrabkhani, M., Arghavani, M., Daneshvar-Mozafari, A., 2011. Temporomandibular disorders and related factors in a group of Iranian adolescents: a cross sectional survey. J. Dent. Res. Dent. Clin. Dent. Prospects 5 (4), 123–127

12. Vojdani, M., Bahrani, F., Ghadiri, P., 2012. The study of dysfunction index among university students in Shiraz. Dent. 405 Res. J. 9 (2), 221–225.

13. Nomura, K., Vitti, M., Oliveira, A.S., Chaves, S., Hallak, J.E., Regalo, S.C., 2007. Use assess the prevalence and severity of mandibular disorders in Brazilian dental undergraduate. Braz. 383 Dent. J. 18 (2), 163–167

14. de Oliveira, A.S., Dias, E.M., Contato, R.G., Berzin, F., 2006. Prevalence study of signs and symptoms of temporomandibular disorder in Brazilian college student. Braz. Oral Res 20 (1), 3–7.

15. Farsi, N.M.A., 2003. Symptoms and signs of temporomandibular disorders and oral parafunctions among Saudi children. J. Oral Rehabil. 30, 1200–1208.

16. Feteih, R.M., 2006. Signs and symptoms of temporomandibular disorders and oral parafunctions in urban Saudi Arabian adolescents: a research report. Head Face Med. 2, 25.

17. Dworkin, S.F., LeResche, L., 1992. Research diagnostic criteria for temporomandibular disorders: review, criteria, examinations and specifications, critique. J. Carniomandib. Disord. 6 (4), 301–355.

18. Schiffman, E., Ohrbach, R., Truelove, E., Look, JP., etal, 2014. Diagnostic Criteria for 394 Temporomandibular Disorders (DC/TMD) for clinical /TMD Consortium Pain /10.11607/jop.1151.

19. Da Fonseca, D.M., Bonfante, G., Valle, A.L., de Freitas, S.F.T., 1994. Diagno´ sticopelaanamnese da disfunc¸ a˜ ocraniomandibular. Rev. Gauch de Odontol. 4 (1), 23–32.

20. Campos, J.A.D.B., Goncalves, D.A.G., Camparis, C.M., Speciali, J.G., 2009. Reliability of a questionnaire for diagnosing the severity of temporomandibular disorder. Rev. Bras. Fisioter. 13 (1), 38-43

21. Pallegama, R.W., Ranasinghe, A.W., Weerasinghe, V.Smuscle related temporomandibular disorders. J. Oral Rehabil.

22. Pesqueira, A.A., Zuim, P.R., Monteiro, D.R., RibeiroPdo, P., between psychological factors and symp- 390 toms of TMD in university undergraduate students. Acta Odontol (3), 182–187.

23. Bonjardim, L.R., Lopes-Filho, R.J., Amado, G., Albuquerque Jr., R.L., Goncalves, S.R., 2009. Association between symptoms of temporomandibular disorders and gender, morphological occlu- sion, and psychological factors in a group of university students. Indian J. Dent. Res. 20, 190–194.

24. Magnusson T, Egermark I, Carlsson GE. A longitudinal epidemiologic study of signs and symptoms of temporomandibular disorders from 15 to 35 years of age. J Orofac Pain 2000;14:10–19.

25. Celic R, Jerolimov V, Knezovic Zlataric D. Relationship of slightly limited mandibular movements to temporomandibular disorders. Braz Dent J 2004;15:151–54.