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## PREVALENCE OF TEMPOROMANDIBULAR DISORDERS AMONG PATIENTS WITH TOTAL AND PARTIAL DENTURES

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**Abstract:** The temporomandibular joint, also known as the jaw joint is a differentiated joint that differs from the other joints in the human body due to its specificity. Under temporomandibular disorders implied term that defines a subset of patients' orofacial disorders involving many different complains of pain that can occur in patients. These include pain in the temporomandibular joint, fatigue of the craniofacial muscles, especially the masticatory muscles, then limitation of the mandibular movement and the presence of the articular movement. Temporomandibular joint disorder is a common health problem. The etiology of temporomandibular disorders is multifactorial. The most common factors are occlusal obstruction, tooth loss, emotional stress, dysfunction of the masticatory muscles as well as adjacent structures, and internal and external changes in the structure of the temporomandibular joint or a combination of such factors.

The main purpose of this study was to determine the prevalence of temporomandibular disorders in patients with total and partial toothless, as well as to estimate the time of use and the reason for wearing the partial and total denture, to determine the prevalence of temporomandibular disorders in correlation with age, gender, nationality and degree of education of patients and to determine if there is pain and clicks in the temporomandibular joint.

The study included 30 patients from Skopje aged 46 to 85 years, 17 women and 13 men. All the respondents in this study met the following criteria: the presence of any type of prosthetic device in the oral cavity; patients in need of renewal or replacement of the prosthetic appliance for aesthetic and/or functional reasons; patients who need to make prosthetic devices in the oral cavity. The presented data were obtained from the research conducted in the period from 15.11.2019 to 28.01.2020 in which the following procedures were performed: anamnestic data, clinical examination and filling in a specially created questionnaire for patients.

Based on the obtained data, their analysis and the obtained results from our research, we can give the following conclusions: we registered a higher prevalence of temporomandibular disorders in patients with total compared to patients with partial dentures; pain during lateral movements is more pronounced in patients with total dentures; regarding the causes that led to total or partial toothless, we can conclude that in patients with total toothless periodontitis is much more prevalent, while in patients with partial toothless the main cause is caries; there is no association between the prevalence of temporomandibular disorders with ethnicity, gender and level of education in patients with total and partial toothless; regarding the presence of pain in the temporomandibular joint, we noticed equal presence in both groups, while clicking in the temporomandibular joint was present in a larger number of patients with partial dentures.

**Keywords:** partial denture, prevalence, temporomandibular disorders, temporomandibular joint, total denture.

### 1. INTRODUCTION

The temporomandibular joint is a paired joint and the only movable connection between the lower jaw and the cranium. The movements in both joints are connected and synchronized and allow movement of the lower jaw. Joints are associated with a number of activities, such as chewing, phonation, swallowing. The temporomandibular joint is not an isolated but anatomically and functionally it is related to the teeth, head and neck muscles and the surrounding organs. The temporomandibular joint, also known as the jaw joint is a differentiated joint that differs from the other joints in the human body due to its specificity.

Under temporomandibular disorders implied term that defines a subset of patients' orofacial disorders involving many different complains of pain that can occur in patients. These include pain in the temporomandibular joint, fatigue of the craniofacial muscles, especially the masticatory muscles, then limitation of the mandibular movement and the presence of the articular movement. (Ahmed et al, 2018) It is characteristic that all signs and symptoms

worsen with the movement of the lower jaw, which occurs: limited mobility of the lower jaw, increased sensitivity to palpation and pain in the masticatory muscles, increased sensitivity and pain in the joint, locking and clicking during movement, pain when moving the lower jaw, improper movement of the lower jaw, headache, neck pain, possible hearing and balance problems. (Bader KA, 2015) Temporomandibular joint disorder is a common health problem. (Karthik et al, 2017)

Temporomandibular disorders can be classified into the following categories: (Okeson J.P, 2019)

1. Masticatory muscle disorders – protective co-contraction; local myalgia; myofascial pain; myospasm and central mediated myalgia.
2. TMJ disorders – derangements of the condyle (disc disorders); structural incompatibility of the articular surfaces; inflammatory disorders of the TMJ and inflammatory disorders of associated structures.
3. Chronic mandibular hypomobility disorders – ankylosis; muscle contracture and coronoid impedance.
4. Growth disorders – congenital and developmental bone disorders and congenital and developmental muscle disorders.

The etiology of temporomandibular disorders is multifactorial. The most common factors are occlusal obstruction, tooth loss, emotional stress, dysfunction of the masticatory muscles as well as adjacent structures, and internal and external changes in the structure of the temporomandibular joint or a combination of such factors. (Chandak et al, 2017) According to the American Academy of Oropharyngeal Pain, temporomandibular disorders are defined as a group of disorders involving the masticatory muscles, the temporomandibular joint (TMJ) and adjacent structures. (Carrara et al, 2010)

Diagnostic procedures performed for these diseases include: detailed history, clinical examination, plaster models, as well as additional diagnostic methods (radiography, echo, computed tomography and magnetic resonance imaging).

The main purpose of this study was to determine the prevalence of temporomandibular disorders in patients with total and partial toothless, as well as to estimate the time of use and the reason for wearing the partial and total denture, to determine the prevalence of temporomandibular disorders in correlation with age, gender, nationality and degree of education of patients and to determine if there is pain and clicks in the temporomandibular joint.

## 2. MATERIAL AND METHOD

The study included 30 patients from Skopje aged 46 to 85 years, 17 women and 13 men, who were divided into two groups: Group 1 – wearers of total dentures (15) and Group 2 – wearers of partial dentures (15). Both groups in this study met the following criteria: the presence of any type of prosthetic appliance in the oral cavity; patients in need of renewal or replacement of the prosthetic device for aesthetic and/or functional reasons; patients who need to make prosthetic appliances in the oral cavity. The presented data were obtained from the research conducted in the period from 15.11.2019 to 28.01.2020 in which the following procedures were performed: anamnestic data, clinical examination and filling in a specially created questionnaire for patients.

## 3. RESULTS

Respondents included in the survey were aged 46 to 85 years. Of the total number of patients (30), 17 (56.6%) were women and the remaining 13 (43.3%) were men. Group 1 (wearers of total dentures) consisted of a total of 15 patients, of which 6 were women (40%) and 9 were men (60%). Group 2 (wearers of partial dentures) also consisted of a total of 15 patients, with 5 men (33.3%) and 10 women (66.6%).

Patients were clinically examined to confirm general oral status, the presence and/or absence of a prosthetic device, the condition of the tooth, and the presence of pain and clicking in the temporomandibular joint.

The information obtained and the clinical examination were used to detect the presence of temporomandibular disorders in patients. From the total number of respondents, the ethnic status was as follows: 57% of the patients were Macedonians, 33% Albanians, 7% Turks and 3% Serbs. Regarding the level of education, in both groups the highest percentage, ie 56.6% were with secondary education, 26.6% with primary education and only 16.6% with higher education. (Table No. 1)

*Table No. 1. Classification of the patients based on demographic status and education*

	Macedonian	Serbian	Albanian	Turkish	Primary school	High school	Faculty diploma
Group 1	9 (60%)	0	4 (26,7%)	2 (13,3%)	3 (20%)	10 (66,7%)	2 (13,3%)
Group 2	8 (53,3%)	1 (6,7%)	6 (40%)	0	5 (33,3%)	7 (46,7%)	3 (20%)
<b>Total</b>	57%	3,3%	33,3%	6,6%	26,6%	56,6%	16,6%

Regarding the causes that led to total or partial toothless, in Group 1 the dominant cause was periodontitis with 80%, while in Group 2 caries with 73.3%. The results obtained for the presence of difficulties and pain, difficult opening and/or closing, pain during lateral movements, pain in the temporomandibular joint, headaches and pain in the neck area, muscle fatigue, bad habits and nervous person, for all parameters were more pronounced in Group 1. Clicking of the joint during mastication was the only prevalent symptom in Group 2. (Table No. 2)

*Table No. 2. Prevalence of symptoms of TMD*

	Group 1	Group 2
<b>Caries</b>	3 (15%)	11 (73,3%)
<b>Periodontitis</b>	12 (80%)	4 (26,7%)
<b>Difficult opening and/or closing</b>	2 (13,3%)	2 (13,3%)
<b>Pain during lateral movements</b>	3 (20%)	0
<b>Pain in the temporomandibular joint</b>	3 (20%)	2 (13,3%)
<b>Headaches and pain in the neck area</b>	3 (20%)	1 (6,6%)
<b>Muscle fatigue</b>	2 (13,3%)	1 (6,6%)
<b>Clicking of the joint during mastication</b>	1 (6,6%)	3 (20%)
<b>Bad habits (teeth clenching or grinding)</b>	9 (60%)	4 (26,6%)
<b>Nervous person</b>	4 (26,6%)	4 (26,6%)

#### 4. DISCUSSION

The main purpose of this study was to determine the condition of the stomatognathic system in order to observe the prevalence of temporomandibular disorders in patients with total and partial dentures. Comparing the data obtained in this study with other studies was very complex due to the existence of numerous variations in context of diagnostic methodology, the size of the experimental sample and criteria between different studies. In the contemporary dental science literature, there are a small number of articles examining the presence of temporomandibular disorders in patients with partial and total dentures. That is why we conducted this study in order to determine the prevalence of temporomandibular disorders and their correlation to total and partial toothless. Based on the obtained results, the presence of total and partial dentures was determined, the reasons that led to their application, the pain in the area of the temporomandibular joint, the muscle fatigue as well as the presence of bad habits such as teeth clenching or grinding. All respondents (30) aged 46 to 85 years were exposed to clinical examination and questionnaire. The questionnaire consisted of patients' personal data, time period of use of total and partial dentures, difficulty in opening and closing the mouth, presence of pain in temporomandibular joint, clicking in the temporomandibular joint during chewing and muscle fatigue.

In Brazil, several studies have evaluated the prevalence of temporomandibular joint signs and symptoms in the population. A recent study showed that the population with a percentage of 53.21% had at least one of the symptoms of temporomandibular disorders. The students at the faculty showed that the presence is higher among women (63.11%) versus men (40.62%). (Nomura K. et al, 2007)

Bordin et al. examined the presence of signs and symptoms of temporomandibular disorders in patients with natural dentition, partial and total dentures. The most prevalent sign and symptoms of temporomandibular disorders in patients with natural dentition were pain or difficulty in chewing or talking, as well as change in bite and deviations during the course of mandibular movements. In patients with partial dentures, changes in the bite, presence of joint sounds, pain during excursive movements and muscle tenderness have been reported. The most prevalent signs and symptoms in patients with total dentures were limited to mouth opening and frequent and severe headaches. However, the presence of temporomandibular disorders was most pronounced in patients with partial dentures, while the other two groups had similar results. (Bordin et al, 2013)

In contrast, in our study the prevalence of temporomandibular disorders was more pronounced in patients with total versus partial dentures, although it was not statistically significant. Only the symptom of clicking of the joint during mastication was more pronounced in partial denture wearers, as in the study above, which may be due to the smaller experimental sample. Similar results have been obtained by Katyayan et al. in their research. (Katyayan et al, 2016) In our study we did not find a link between the prevalence of temporomandibular disorders and age, ethnicity, and education, as opposed to a University of Sudan study showing a much higher incidence of symptoms in the young population, most likely due to stressful lifestyles. (Abuaffan Amal, 2016)

However, in terms of gender, women were dominant in both groups. Although not statistically significant in our study due to sample size, similar results were obtained in their study by AlZarea et al. (AlZarea BK, 2017) as well as Al-sanabani et al. (Al-sanabani et al, 2017)

The most common causes of toothless are caries and periodontitis. In our patients with total dentures, the dominant cause in 80% was periodontitis, while in patients with partial dentures with 73.3% was caries. Bad habits such as teeth clenching or grinding have been reported in 60% of total denture wearers, which is a very common cause of developing temporomandibular disorders. A study of 12- to 14-year-olds in schools in Araraquara, Sao Paulo, Brazil found that clenching and grinding their teeth during the day or night, as well as parafunctional habits, were associated with painful temporomandibular disorders and increased the likelihood of occurrence in adolescents. (Fernandes et al, 2016)

## 5. CONCLUSION

Based on the obtained data, their analysis and the obtained results from our research, we can give the following conclusions: we registered a higher prevalence of temporomandibular disorders in patients with total compared to patients with partial dentures; pain during lateral movements is more pronounced in patients with total dentures; regarding the causes that led to total or partial toothless, we can conclude that in patients with total toothless periodontitis is much more prevalent, while in patients with partial toothless the main cause is caries; there is no association between the prevalence of temporomandibular disorders with ethnicity, gender and level of education in patients with total and partial toothless; regarding the presence of pain in the temporomandibular joint, we noticed equal presence in both groups, while clicking in the temporomandibular joint was present in a larger number of patients with partial dentures.

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