

# Assessment of the Pain, Stress and Emotional Factor Related to the Occurrence of Bruxism

## SUMMARY

**Background/Aim:** *Bruxism is a parafunctional habit that has multiple etiology. Globally it is a widespread problem. The purpose of this study was to assess the presence of pain, stress and to understand the emotional factor and their relations to the occurrence of bruxism. Material and Methods:* For the purpose of this paper, 40 patients with partial edentulossness and bruxism were treated prosthetically and with night dentures. They were assessed for the degree of the pain they feel and were given questionnaires for the level of stress they feel and for their psychological situation. The control group consisted of 40 patients who were not treated but were diagnosed with the same methods like the previous group. **Results:** Patient feel pain from the consequences of bruxism, disregarding the statistical significance related to gender. Stress plays a major role as we live in a dynamic and demanding society. The more competitive and ambitious the person is the more there are possibilities for occurrence of bruxism. Emotions are a very complex matter that unconsciously can be connected to the presence of bruxism. **Conclusions:** Besides prosthetic rehabilitation, sometimes a multidisciplinary approach is needed. Dentists should be aware of their role as psychiatrist and need to be educated of the principles of a patient's analysis and of the cognitive behavioral therapy.

**Key words:** Pain, Stress, Emotional Factor, Bruxism

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**ORIGINAL PAPER (OP)**

**Balk J Dent Med, 2019;147-151**

## Introduction

In the dictionary of prosthetic terms, bruxism is defined as an unconscious oral habit of rhythmically dysfunctional pressing, squeezing, and clenching with the teeth while performing movements that are not part of the function of mastication. These actions can lead to occlusal trauma. It is an oral parafunctional activity that is not related to normal physiological functions, such as speech, breathing, chewing and swallowing<sup>1</sup>.

Bruxism can occur in 6-20% of the population, at any age starting from the eruption of the deciduous teeth<sup>1</sup>. Bruxism is a common phenomenon in our population manifested by grinding and clenching of the teeth. However, this dysfunctional habit is characterized by varying intensity and periodic repetition. This condition tends to decrease with age, while it is generally perceived to have a high prevalence in the general population<sup>2</sup>.

The etiology of Bruxism is not entirely clear<sup>3</sup>. Few morphological factors such as dental occlusion and anatomy of the bony structure of the stomatognathic system can be related to bruxism<sup>4,5</sup>. There are more recognizable etiological factors leading to the diagnosis of bruxism. Psychosocial factors such as stress and certain personal characteristics, as well as pathophysiological factors (eg, diseases, trauma, genetics, smoking, caffeine intake, medication and illicit drugs), sleep disorders (sleep apnea and snoring), and involvement of the dopaminergic system are often present in the etiology of bruxism<sup>1,2</sup>. One thing is certain - there is no single factor responsible for the occurrence of bruxism. But it is evident that there is no single treatment that is effective in eliminating or reducing it<sup>5</sup>.

Ohayon et al. have done research on a larger sample of the general population in which they prove high stress life to be a significant risk factor for nighttime

bruxism<sup>6</sup>. Van Selms *et al.* again show a link between stressful life and the occurrence of bruxism during the day, but talk about the experience as well as the expected stress that cannot be adequately measured<sup>7</sup>. Therefore, further research suggests that there is a link between bruxism and psychosocial conditions, but is not the only key to its occurrence. Psycho-emotional factors are considered to be one of the most important etiological factors. It may be related to the mental health of bruxers as they use the stomatognathic system to discharge their aggressiveness<sup>8-14</sup>. However, its etiology is related to local, systemic<sup>11</sup> and neurological factors<sup>15</sup>. The purpose of this article is assessment of the pain, stress and emotional factor related to the occurrence of bruxism and analyzing methods for helping patients.

## Material and Methods

A total of 80 patients with partial edentulosity with bruxism were examined as material for the study. The patients were divided into two main groups:

- 40 patients with partial edentulosity and diagnosed bruxism who were prosthetically and aesthetically - functionally rehabilitated and treated with individually designed night dentures and,
- 40 patients with partial edentulosity and diagnosed bruxism who were not treated and represented the control group.

All patients (n = 80) were between the ages of 35 and 63 of both sexes (39 male patients, 41 female patients).

The research was performed in the Public Health Organisation, University Dental Clinical Center "St. Pantelejmon" at the Clinic for removable prosthetics, with approval from the ethical committee of the Faculty of Dentistry in Skopje, University of "St. Cyril and Methodius" in Skopje, Republic of North Macedonia.

Prior to treatment, each patient received a consent form for the operation and interventions. Patients also answered a questionnaire on how they felt pain and changes in the mouth caused by bruxism. The analysis of the answers provided important data regarding the subjective symptoms that patients with bruxism experience. The answers provided contribute to the diagnosis, type, form of bruxism, and assist in the treatment of temporomandibular dysfunction (TMD).

An anonymous psychological survey was conducted to contribute to the etiological causes of bruxism. It is used to determine the stressors present in everyday life and further helps in making a diagnosis.

In determining the presence of pain, we used a test scale ranging from 0 to 10:

- (1) 0 - no pain present
- (2) 1-3 - mild degree of pain
- (3) 4-6 - moderate degree of pain

(4) 7-9 - very severe degree of pain

(5) 10 - worst pain possible.

After numbering the pain we categorized it using an auxiliary scale.

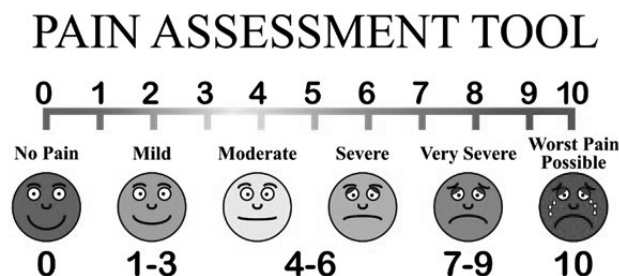


Figure 1. Auxiliary scale for categorizing pain<sup>16</sup>

Patients were analyzed psychologically. Some methods used can be described as psychoanalytical using thorough dental and medical history of the disease. Patients were asked about their lifestyles, nutritional habits and overall health. Cognitively behavioral methods were also implemented.

## Results

Statistical analysis of data was performed using chi-square test, and for more detailed explanations of the data, Pearson Chi-Square test was used to make a significant difference. Statistical data processing was performed with the help of statistical analysis program - IBM SPSS 21. From there the results obtained were ordered in tables for further analysis.

The probability level for explaining the existence of statistical significance is also applied. If  $p > 0.05$  or  $p > 0.001$  there is no statistical significance. And vice versa, if  $p < 0.05$  there is statistical significance, and if  $p < 0.01$  or  $0.001$  there is a statistically significant significance. This level of probability is determined throughout the study and values are obtained at the end of the statistical process. Student's T - test is used to test the significance of the difference between two arithmetic environments.

On a scale from 1 to 5 the degree of pain is showed as a level of stress, which is deducted from the scale explained in the text, which for all patients (n= 80) was 3,02 (Table 1 and Table 2). With using the T test for determining the significance of differences, it has been seen that between the patients from male and female gender there does not exist statistical significance in terms of the level of stress (Table 3).

Table 1. Results from the degree of pain

Degree of pain at n=80 (100%)	0(1)		1-3(2)		4-6(3)		7-9(4)		10(5)	
	n	%	n	%	n	%	n	%	n	%
Headache- Temporal	4	5	21	26,25	31	38,75	23	28,75	1	1,25
Pain in the neck	30	37,5	45	56,25	5	6,25	0	0	0	0
Pain in the ears	21	26,25	32	40	27	33,75	0	0	0	0
Pain in the facial left side	30	37,5	22	27,55	28	35	0	0	0	0
Pain in the facial right side	29	36,25	23	28,75	28	35	0	0	0	0
Pain in the morning	0	0	35	43,75	29	36,25	0	0	0	0
Pain at night	0	0	12	15	8	10	1	1,25	0	0
Pain at mouth opening	10	12,5	19	23,75	29	36,25	20	25	2	2,5
Pain at chewing	5	6,25	25	31,25	37	46,25	10	12,5	3	3,75
Pain in the TMJ	14	17,5	22	27,5	34	42,5	8	10	2	2,5
Pain in the teeth	12	15	15	18,75	29	36,25	24	30	0	0
Pain accompanied with swelling	42	52,5	10	12,5	15	18,75	13	16,25	0	0

Table 2. Determining the degree of pain

Degree of pain	n	Minimum	Maximum	Mean	Std. Deviation
Level of stress	80	1,00	5,00	3,02	0,87113

Table 3. Determining the level of stress using the T test and p

Variables	Gender	n	Mean	Std. Deviation
	male	39	2,97	0,777
	female	41	3,07	0,958
<b>T</b>			-0,505	
<b>p</b>			>0,05	

Table 4. Correlation between stress factors in patients with bruxism using the  $\chi^2$  test

Pirson's $\chi^2$ test Stress factors	Patients with bruxism				Total		
	male		female		n	%	
	n	%	n	%			
C2*	career	12	15	9	11,25	21	26,25
	relations	15	18,75	3	3,75	18	22,5
	family	11	13,75	1	1,25	12	15
	finances	11	13,75	1	1,25	12	15
	health	10	12,5	1	1,25	11	13,75
	politics	6	7,5	0	0	6	7,5
<b>Total</b>	65	81,25	15	18,75	80	100	
<b>Value of <math>\chi^2</math></b>	11,830						
<b>df</b>	5						
<b>p</b>	0,037						

From the results presented in Table 4. it can be seen that out of the total number of patients with bruxism n= 80 (100%), in n= 21 (26.25%) there is a direct statistical significance between the career and bruxism. In n= 18 (22.5%) of the examinees there is a statistical significance in interpersonal relationship with the occurrence of bruxism. Family problems are represented by n= 12 (15%) of patients, financial problems with n= 12 (15%), health problems with n= 11 (13.75%), and political events with n= 6 (7.5%) of the participants in this study and are statistically significant for the occurrence of grinding with the teeth and are more prevalent in female patients.

## Disussion

The literature suggests that patients who have daily bruxism related to psychological problems should be referred to a psychologist or psychiatrist<sup>17</sup>. In this study only one patient had an existing diagnosis by a psychiatrist who was appropriately treated. The patient was aware of the association between daily bruxism and his condition.

In this way occlusal parfunction - bruxism acquires the character of treatment with a multidisciplinary approach. The team of specialists should collaborate and create a protocol of work for patients with bruxism with the common goal - improving their oral health and thus overall health.

Bruxism, like any other pathological condition, results from an imbalance with multifactorial etiology. If found the etiological cause, it should be eliminated. If stress is a major cause, the therapist takes a different approach, where in addition to aesthetic - functional rehabilitation with prosthetic restorations and night

dentures, he also acts with the help of advice. The therapist must take a calming approach in order for the patient to have confidence in him, a smooth communication to achieve a positive effect. Dealing with stress in this dynamic time of life is a subtle area that puts the dentist - a prosthetist - in a psychological role. In this way the therapist when taking a thorough history of the disease, examines the patient's problems and the role of stress in their daily life. Literature explains that sometimes the desire to succeed has a stressful effect on patients<sup>18</sup>.

During aesthetic - functional rehabilitation, individuality in the approach of each patient is of great importance. The individual design of a prosthetic rehabilitation involves understanding of the conditions of the mouth under which night dentures are made. They should help the patient relieve TMD symptomatology, preserve the therapeutic approach achieved, and create a positive lifestyle.

The tendency to grind and press the teeth in association with anger, nervousness or aggression has been recognized since Bible times and has been extensively studied<sup>15</sup>. Pinching and gritting teeth has historically been linked to tense and unhappy circumstances.

Stress is a disease of today's dynamic living. Career building is a factor that has dominated the respondents of study as a stressor. Furthermore, interpersonal relationships, family problems, social status, health, and the political situation in the state have a direct impact on one's daily life. Sometimes all the factors together contribute to everyday stress.

Everyone dreams of a better tomorrow. Everyone wants to succeed in life, at a young age people are educated to know and succeed in creating something in life. All of this affects psychosomatic health, consciousness, the subconscious acting on man during his most active years. The power of the subconscious is not to be underestimated. Many people control themselves through the day and, by suppressing their emotions, they reflect on a subconscious level. People are learning to be diplomats in a dynamic, fast-moving pace of living. They learn how to avoid conflict situations and, if found, learn how to deal with them. In the process, they should have a high degree of self-control. If one analyzes such an individual, it can be seemingly happy, even always smiling. That person is often a fighter in a fine, cultural way, with self-control of emotions and it is difficult to discover what she is feeling. If we make a psychoanalysis of the type of person we are in contact with or are treated with, and if we do a psychological survey it may be perceived that the truth is quite different. Behind every man lies his story. A story in which he concludes by questioning that he may have had a death in the family, or perhaps a relocation or separation that he could hardly bear. The story of life contains his daily struggle for success. Behind every man's smile, there are millions of

suppressed emotions. One such level of manifestation of those repressed emotions is through clenching, grinding, and gnashing of the teeth. It can happen throughout the day, but overnight it can have devastating effects on oral health, and thus on overall human health. As a mechanism of discharging that negative energy accumulated during the day, the occurrence of bruxism at night occurs. Stress is a direct trigger for many diseases, including bruxism. If there is a genetic predisposition and other etiological factors responsible for its occurrence, stress will only provoke a manifestation of the disease.

From the point of view of the analysis of the anonymous psychological questionnaire, statistical significance was observed in terms of patients' gender-bending related to bruxism. Other questions differed on the dynamics of stress occurrence, and there was no statistically significant gender-specificity in patients with bruxism.

Statistical T - tests were also performed on the association of the major stress factors of patients with an anonymous psychological survey of bruxism, indicating career building and interpersonal relationships as major contributing factors to the etiological occurrence of bruxism.

Patients in the anonymous psychological survey indicate a sense of tension, a desire for success, a desire for financial security. Many report problems at work with their superiors. Others cite concerns over financial problems, inability to make ends meet, or family problems. All of the above factors complement each other and can create spiritual unrest, and thus influence the cause of bruxism.

All patients were advised of lifestyle changes, in terms of stress avoidance, as a direct factor that complements the multifactorial etiology of bruxism. Patients were advised to change their lifestyle.

Sutin A. in his papers speaks of the connection between emotional stability and bruxism<sup>12</sup>. The more stable the patient, the stronger the degree of bruxism. Patients were also advised to eat healthy foods that relieve symptomatology. Among other things, they were advised not to chew gum especially during the acute period of painful symptomatology. The same was true for chewing solid, raw and hard food. In patients who do not get proper nutrition, a wise decision is to change their diet. It has been popular in recent decades to visit a nutritionist, but as an alternative adjunctive therapy is the creation of a diet for a group of patients with bruxism. A diet rich in fiber improves the human body as a whole. They can be present in whole grains, whole grains, etc. Avoiding white flour, white sugar and reducing salt intake are recommended. Patients were advised to take vitamin and mineral supplements. It was recommended to consume vitamins B5, C, D, and minerals magnesium, calcium, potassium. Omega-3 fatty acids essential for the human body are also important for their consumption.

In addition to a healthy diet they were advised for moderate physical activity, such as walks in nature, practicing meditation, yoga, etc. The power of positive thinking was pointed out. If they had pain, patients were also prescribed NSAIDs, medications like antibiotics, corticosteroids, for its reduction as applied in the literature<sup>19</sup>.

## Conclusions

In this paper the need to manage bruxism is addressed with a delicate approach. After having establishing the role of the pain, stress and emotional component and after the aesthetically - functional rehabilitation of patients with prosthetic devise and night dentures, therapist should thrive to pay meticulous attention to the mental health of the patient. Despite a lot of literary data and scientific research, bruxism is a huge area of interest that needs to be constantly worked on, researched, innovated.

All of this points to a deeper understanding of all the details involved in the area - bruxism, of those that have been discovered and can be examined by measuring instruments as well as those that need to be discovered and proven.

The realization that bruxism needs multidisciplinary approach in its therapy leads to the conclusion that prior to the prosthetic approach, it is necessary to educate the patient to lead to awareness, as the power of the subconscious is immense and not to be underestimated.

Stress as an integral part of daily, stormy and dynamic living, and present in most patients, is the cause of additional therapy such as physical therapy, meditation, yoga or other methods of releasing it.

It has been concluded that additional pharmacological therapy is needed to rapidly alleviate the symptomatology of bruxism using analgesics, corticosteroids, NSAIDs, antibiotics, vitamins and minerals.

Most importantly dentist need to enhance their psychological role and learn patient how to benefit by applying the cognitive behavioral therapy in everyday life thus learning how to help themselves and their overall health.

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**Conflict of Interests:** Nothing to declare.

**Financial Disclosure Statement:** Nothing to declare.

**Human Rights Statement:** All the procedures on humans were conducted in accordance with the Helsinki Declaration of 1975, as revised 2000. Consent was obtained from the patient/s and approved for the current study by national ethical committee.

**Animal Rights Statement :** None required.

Received on August 12, 2019.

Revised on September 2, 2019.

Accepted on September 23, 2019.

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