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DOCTORAL THESIS

STUDY ON THE RELATIONSHIP BETWEEN SLEEP BRUXISM, PERSONALITY TRAITS AND QUALITY OF LIFE

ABSTRACT

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ABBREVIATIONS USED IN THE TEXT

DMA – dento-maxillary apparatus

DNA - deoxyribonucleic acid

AFFM - The Alternative Five Factor Model

AQLQ-M - Asthma Quality of Life Questionnaire

AQoL-4D - Assessment of quality of life with 4 dimensions

RMMA - Rhythmic Masticatory Muscle Activity

TMJ – temporomandibular joint

SB – sleep bruxism

MB – mixed bruxism

AB **-** awake bruxism

CASP-16 **-** Control, Autonomy, Self-Actualization and Pleasure-16

CBCT – cone beam computed tomography

CDC HRQoL-4 - Health-Related Quality of Life-4

CDC HRQoL–14 – Health-Related Quality of Life-14

MVC – maximal voluntary contraction

CP5F – The Five-Factor Personality Questionnaire

CQoLC**-**K **-** Quality of Life Index for Caregiver-Cancer Korean version

DLQI **-** Dermatology Life Quality Index

EEG – electroencephalogram

EKG/ECG – electrocardiogram

EMG – electromyography

EORTC-QLQ-C30 - European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30

EQ-5D – EuroQol The 5-level EQ-5D version

EQ-VAS - EuroQol visual analog scale

FLQA-d - Freiburg Life Quality Assessment-dermatitis

IBDQ - Inflammatory Bowel Disease Questionnaire

ICIDH - International Classification of Impairment, Disability and Handicap

L-DOPA – levodopa

LSD - lysergic acid diethylamide

NMDA - N-methyl-D-aspartate

OHIP-14 - Oral Health Impact Profile

OIDP - Oral Impact on Daily Performance

WHO - World Health Organization

PROMIS - Patient-Reported Outcomes Measurement Information System - Global Health Scale

PSG – Polysomnography

QoL – Quality of life

QOLI – Quality of Life Inventory

REM – rapid eye movement

RMMA - rhythmic movements of the masticatory muscles activity

SIBDQ - Short Questionnaire for Inflammatory Bowel Diseases

CNS – central nervous system

STAB – The standardized system used to assess bruxism

TWES - Tooth Wear Evaluation System

ZKPQ - Zuckerman-Kuhlman Personality Questionnaire

CURRENT STATE OF KNOWLEDGE

I. MORPHOLOGY AND PHYSIOLOGY OF DENTAL OCCLUSION

The stomatognathic system is a functional unit of the body responsible for mastication, speech and swallowing. It is composed of bones, joints, ligaments, teeth, muscles and a detailed nervous control with a role in the regulation and coordination of all the component structures.

Occlusion concepts vary with almost every specialty of dentistry. Common definitions are based on the static aspect of the dentition, where the description of the occlusion highlights the way in which certain individual parts of the maxillary teeth fit together with specific parts of the mandibular teeth. Until recently, only a few occlusion concepts included functional criteria. The idea of a functional relationship (versus the idea of a simple static relationship) of the occlusal surfaces has become increasingly important due to the recognition that functional disorders of the masticatory system can be related to malocclusion, occlusal dysfunction, and oral motor behavior disorders, including bruxism . [2]

The anterior teeth are suited to guide the mandible in protrusive and lateral excursions. The anterior teeth (including the canines) usually have a vertical overlap, which allows the posterior teeth to disengage when the mandible moves from the position of maximum intercuspation. A second important element is represented by the fact that the heights of the cusps of the posterior teeth decrease towards the back, which also facilitates their disengagement when the mandible moves from the position of maximum intercuspation. The mandible is a type III lever (like a nutcracker), so the occlusal force on the anterior teeth will be lesser than the force on the posterior teeth. Threshold and reflex response of proprioceptors reduces the load on the anterior teeth, the anterior teeth being suited to protect the posterior teeth during excursion movements of the mandible. [4]

The posterior determinant can be divided into vertical factors affecting the inclination of the cuspid angle and horizontal factors affecting the ridge and sulcus directions of the occlusal morphology. For example: condylar inclination denotes the angle at which the condyle descends along the articular eminences in the sagittal plane. The greater the angle of the articular eminence, the greater the cusp angle and the deeper the fossa. When the

mandibular protrusion movement is performed, the posterior part of the mandible descends at a greater angle than if the angle of the articular eminence is less steep. [10]

The TMJ consists of: the glenoid fossa, the mandibular condyle and the articular disc.

Mandibular movement during normal function and during parafunction involves complex neuromuscular patterns that originate in part from a pattern generator in the brainstem and are modified by influences from higher centers: the cerebral cortex and basal ganglia and from peripheral influences (eg, the periodontium, muscle). [17]

II. THE SCIENTIFIC DIMENSION OF SLEEP BRUXISM

With the participation of bruxism experts from around the world, a new meeting was held in San Francisco in March 2017, which mainly focused on the edification of bruxism classification. Thus, new definitions of bruxism according to circadian rhythm have been provided:

- ✓ „*Sleep bruxism is a masticatory muscle activity during sleep that is characterised as rhythmic (phasic) or non-rhythmic (tonic) and is not a movement disorder or a sleep disorder in otherwise healthy individuals*". [25]

Central and autonomic nervous system roles in the origin of oromandibular activities occurring during sleep are supported by new hypotheses regarding the etiology of bruxism.

The clinical and paraclinical approach to bruxism can be achieved through non-instrumental assessments and instrumental assessments. [42]

PSG for SB assessment is mainly used for research purposes. This method remains the gold standard for diagnosing SB and assessing comorbidity with other sleep disorders. Due to the high cost and complexity, polysomnography has not been introduced as a mandatory evaluation for sleep bruxism in current clinical practice, which is why the need for the clinical use of portable devices has arisen.

Monitoring of masticatory muscle activity and heart rate and the possibility of overnight examination by the patient in their own home at a lower cost and with promising research results, portable EMG devices offer a useful solution for screening or possibly diagnosing patients with emerging sleep bruxism. [54]

The cut-off point (selected to detect individuals with a self-reported history of teeth grinding plus positive clinical signs/symptoms) artificially increased the likelihood that a cut-off point was intentionally set to best match a certain definition of SB. [57]

A new classification system has been suggested, as indicated in the international consensus on bruxism assessment: possible sleep/wake bruxism based on positive self-report only; probable sleep/wake bruxism based on a positive clinical inspection, with or without positive self-report; definite bruxism based on a positive instrumental assessment, with or without a positive self-report and/or a positive clinical inspection. [25]

In 2024, the first version of STAB appears for field testing. The standardized system used to assess bruxism consists of two axes – axis A and axis B. [60]

No method has yet been identified to cure bruxism. Treatment options are aimed at preventing damage to the stomatognathic system and are required when the existence of negative consequences on the oral structures are observed. [49]

III. PERSONALITY TRAITS AND QUALITY OF LIFE

The current requirement in healthcare delivery is to be person-centred, which means respecting the fact that the patient has personality, this influences commitment to preventive care, adherence to pharmacological products, willingness to undergo intervention, monitoring and achieving clinical outcomes. [68]

Two theoretical concepts from biology emerge as central to trait psychology—sociogenomics and response norms. Both provide a more fundamental understanding of traits as biological entities. [78, 79]

Most personality inventories assess several different personality traits. Each trait is rated on its own "scale", which contains several "items". [84]

The Center for Health Promotion at the University of Toronto defines quality of life as the degree to which a person enjoys the important possibilities of life [90]. The term "quality of life" is frequently used in contemporary dental literature, even though it was originally applied mostly to oncology.

There are many different approaches to measuring quality of life. How this is measured clearly relates to how the term is defined and therefore what is that is being measured. [100]

PERSONAL CONTRIBUTION

4. ARGUMENT

Motivation

It is now widely recognized that oral conditions can have different impacts on people and their well-being and quality of life. Dental conditions cause pain, discomfort, and affect proper physical functions such as chewing, speaking, and smiling, and can influence an individual's social roles. Results from various clinical and interventional researches show that dental treatments and public health interventions can improve quality of life related to oral health status. The medical community has recognized the growing importance of patient-reported outcome assessments in clinical practice, public health, and research.

Awareness of the fact that bruxism causes negative effects on the quality of life related to oral health (and not only) will be able to impose measures taken by public oral health policies to combat/limit this phenomenon. Likewise, the identification and highlighting of personality traits as an important weight in the entire arsenal of causal factors could in the future lead to psychological support also promoted through policies aimed at community health.

Although there is research on the elements mentioned above, in-depth studies are needed to better understand the complex interplay between SB, personality traits, and quality of life. The interdisciplinary potential of this topic highlights the need for collaboration between dentists and psychologists, thus favoring a deeper understanding of the phenomenon of sleep bruxism. Within this context, it emerges that the multidisciplinary approach to sleep bruxism creates a starting point for a comprehensive view of the implications of SB.

5. WORK HYPOTHESIS AND GENERAL OBJECTIVES

The work hypothesis for the present research was the assumption that there are significant relationships between sleep bruxism, personality traits, and quality of life. The following general objectives were outlined around this hypothesis: realization of the intraoral epidemiological and clinical profile in the case of a group of patients with self-reported sleep bruxism; highlighting the relationship between episodes of bruxism during sleep and

personality traits in a group of patients with definite sleep bruxism; highlighting the relationship between personality traits, quality of life related to oral health status and global quality of life in a group of patients diagnosed with definite sleep bruxism.

6. Study 1: EPIDEMIOLOGICAL AND CLINICAL INTRAORAL CHARACTERISTICS ASSOCIATED WITH A GROUP OF PATIENTS WITH SELF-REPORTED SLEEP BRUXISM

6.1. Introduction

With the emergence of the new definitions offered to bruxism according to the circadian rhythm on the occasion of the 2017 International Consensus in San Francisco [25], sleep bruxism takes on a new dimension, both in terms of the ways of manifestation and in terms of etiopathogenesis, diagnosis and the problematization raised by the consideration of this phenomenon as a risk factor/protective factor/harmless behavior.

The aim of this research is to perform the intraoral epidemiological and clinical profile of a group of patients with self-reported sleep bruxism.

6.2. Material and method

This study was conducted on an initial number of 360 female and male patients, aged between 21 and 57 years. The study was carried out within the Faculty of Dentistry, Ovidius University of Constanța and within a dental practice during 2021-2024.

In order to identify patients with episodes of self-reported SB, data were taken from the patient observation sheet. Demographic data and data on tobacco, alcohol and caffeinated beverage consumption were also extracted from patient records. For each patient identified with positive self-report for SB, the clinical examination was performed. From the clinical examination, the following were noted: determination of dental wear, identification of soft tissue changes. The periodontal community index was determined by using a periodontal probe (with a spherical active part with a diameter of 0.5 mm and marking from 3.5 mm to 11.5 mm) at the mesio-vestibular level, the middle of the vestibular surface, disto-vestibular level for the following teeth: upper and lower second and first molars; right upper central incisor and left lower central incisor.

The statistical analysis and processing of the obtained data was carried out using IBM SPSS Statistics 2023 and Microsoft Office Excel 2007. With the help of these programs, the following procedures were carried out: graphs and descriptive statistics in order to characterize the variables.

6.3. Results

360 patients were initially enrolled in the study, who benefited from a routine examination in the dental office. 59.4% of the participants presented a negative self-report (Non-B) regarding the perception of bruxism. Depending on the circadian type of manifestation, 12.5% of the participants presented a positive self-report for both forms of bruxism (MB), 12.5% for awake bruxism (AB) and 26.7% for sleep bruxism (SB). According to the study inclusion criteria, the actual study was conducted on a number of 96 patients who self-reported bruxism during sleep. Most of the participants in the study were men, with a percentage of 58.3%, and the percentage of 41.67% corresponds to the female gender.

Most of the participants in the study were non-smokers (86.5%), a percentage of 5.2% stating a consumption of more than 10 cigarettes/day. Regarding alcohol consumption, most patients declared abstinence from alcoholic beverages (55.2%), followed by those who declared occasional consumption (43.8%). The consumption of drinks with caffeine content was found in a proportion of 61.5%. 56% of the study participants stated that they have relatives in the family (mother/father/son/daughter/grandfather/grandmother) known to have sleep bruxism.

The clinical evaluation of tooth wear was performed on a number of 576 sextants.

Table VI.8. Descriptive analysis of tooth wear scores recorded for each sextant

Indices of central tendency	Sextant I	Sextant II	Sextant III	Sextant IV	Sextant V	Sextant VI
Mean	1.427	1.646	1.313	1.406	1.740	1.438
Median	1	2	1	1	2	1
Standard Deviation	0.611	0.740	0.654	0.719	0.567	0.646
Minimum	0	0	0	0	1	0
Maximum	3	4	3	4	3	3
Sum	137	158	126	135	167	138
Cont	96	96	96	96	96	96

Table VI.9 Frequency, percentage distribution and total number of cases for clinical signs indicating the influence of mechanical factors identified at the level of posterior and anterior sextants

Code clinical sign	Posterior sextants		Anterior sextants		**Total cases**
	Upper jaw	Mandible	Upper jaw	Mandible	
1	36 (33.33%)	16 (14.82%)	21 (19.44%)	35 (32.41%)	108
2	73 (28.63%)	60 (23.53%)	50 (19.61%)	72 (28.23%)	255
3	56 (53.34%)	48 (45.71%)	1 (0.95%)	0 (0%)	105
4	24 (30.38%)	22 (27.85%)	24 (30.38%)	9 (11.39%)	79
5	28 (21.54%)	84 (64.61%)	5 (3.85%)	13 (10.00%)	130
6	2 (5.56%)	8 (22.22%)	7 (19.44%)	19 (52.78%)	36
7	44 (28.38%)	57 (36.78%)	14 (9.03%)	40 (25.81%)	155
8	65 (46.76%)	55 (39.57%)	9 (6.47%)	10 (7.20%)	139
9	48 (20%)	67 (27.92%)	57 (23.75%)	68 (28.33%)	240
Total clinical signs	376	417	188	266	**1247**

Table VI.11. Frequency and distribution of severity of tooth wear according to sextants (only scores in the range 1-4 were considered)

Degree of tooth wear	**SI**	**SII**	**SIII**	**SIV**	**SV**	**SVI**	**Total sextants by severity of tooth wear**
	Frequency (Percentage)	Frequency (Percentage)	Frequency (Percentage)	Frequency (Percentage)	Frequency (Percentage)	**Frequency (Percentage)**	
Mild	49 (53.3%)	36 (39.1%)	55 (61.8%)	48 (53.9%)	31 (32.3%)	50 (54.3%)	269 (48.91%)
Moderate	41 (44.6%)	47 (51.1%)	31 (34.8%)	37 (41.6%)	59 (61.5%)	38 (41.3%)	253 (46.00%)
Severe	2 (2.1%)	8 (8.7%)	3 (3.4%)	3 (3.4%)	6 (6.3%)	4 (4.3%)	26 (4.73%)
Extreme	0 (0.0%)	1 (1.1%)	0 (0.0%)	1 (1.1%)	0 (0.0%)	0 (0.0%)	2 (0.36%)

Table VI.12. Distribution of soft tissue changes for the selected batch

The clinical entity	Localization	Frequency	Percent
Linea alba	Right jugal mucosa	18	18.75%
	Left jugal mucosa	15	15.62%
	Bilateral jugal mucosa	24	25.00%
	Not detected	39	40.63%
Lip impression	Upper lip mucosa	4	4.2%
	Lower lip mucosa	14	14.6%
	Upper and lower lip mucosa	4	4.2%
	Not detected	74	77.1%
Tongue scalloping	Right surface of tongue	8	8.3%
	Left surface of tongue	16	16.7%
	Anterior surface of tongue	11	11.5%
	Bilateral	12	12.5%
	Not detected	49	51%

Table VI.13. Statistical distribution of the community periodontal index (CPI) value according to sextants (S = sextant)

CPI value	SI	SII	SIII	SIV	SV	SVI
	Frequency (Percentage)	Frequency (Percentage)	Frequency (Percentage)	Frequency (Percentage)	Frequency (Percentage)	Frequency (Percentage)
0	11 (11.5%)	5 (5.2%)	11 (11.5%)	10 (10.4%)	4 (4.2%)	6 (6.3%)
1	35 (36.5%)	41 (42.7%)	40 (41.7%)	31 (32.3%)	22 (22.9%)	41 (42.7%)
2	37 (38.5%)	39 (40.6%)	35 (36.5%)	45 (46.9%)	49 (51.0%)	35 (36.5%)
3	10 (10.4%)	9 (9.4%)	7 (7.3%)	8 (8.3%)	14 (14.6%)	9 (9.4%)
4	3 (3.1%)	2 (2.1%)	3 (3.1%)	2 (2.1%)	7 (7.3%)	5 (5.2%)
Total	96 (100%)	96 (100%)	96 (100%)	96 (100%)	96 (100%)	96 (100%)

6.4. Discussions

According to the specialized literature, the prevalence of bruxism is up to 30% of the population. [109]. There are older studies according to which the prevalence of sleep bruxism was 15.7% - 17.6% in the general population [110]. Other studies revealed a percentage of 31.8% for sleep bruxism. [111]

Lavigne et al. tested smoking as an exacerbation or risk factor for SB. The prevalence of SB was significantly higher for smokers with bruxism (12% - 82 of 682 participants) than for those with bruxism episodes that are nonsmokers (6.7% - 80 of 1192 participants; $P < 0.001$). [118] It has been observed that when the amount of alcohol consumed increases, the risk of weekly bruxism episodes increases. [108]

Coffee consumption is not related to sleep fragmentation in regular coffee drinkers. Habitual coffee and tea consumption does not influence C-reactive protein, serum uric acid, electrolyte and lipid concentrations in patients with sleep disorders. [119]

According to Khoury et al. a hazard ratio of 2.5 for having a first-degree family member with SB was identified in individuals with sleep bruxism. [115]

Johansson et al. highlights that the maxillary and mandibular anterior teeth were more affected by the wear process compared to the lateral teeth, both incisors and canines presented an average score of 2, which corresponds to dentine wear, no significant differences being identified between incisors and canines. For the posterior teeth, an average score equal to 1 was recorded – facets marked by wear in the enamel, with no major differences between premolars and molars. [123]

Multivariate analyzes showed that several variables were independently associated with the risk of developing non-carious cervical lesions, bruxism (without specifying the type of bruxism) being considered statistically significant ($P = 0.018$, $P < 0.05$ being considered significant). [125]

Daniele Manfredini et al. by analyzing some studies from the specialized literature suggests that bruxism cannot cause periodontal damage in itself. [130]

7. Study 2: STUDY OF THE RELATIONSHIP BETWEEN EPISODES OF SLEEP BRUXISM AND PERSONALITY TRAITS IN A GROUP OF PATIENTS WITH DEFINITE BRUXISM

7.1. Introduction

In STAB published in the Journal of Oral Rehabilitation in 2024, the authors indicate as part of the SB domain (A7) that instrumental assessment during sleep should be performed using electromyographic devices, whose measurements should be interpreted based on parameters regarding masseter muscle events and activity (number of events exceeding 10% of maximum voluntary contraction, bruxism index, bruxism time index, bruxism work index, if available). Regarding the polysomnography assessment, this appears as an optional item. [131]

Jorgić-Srdjak et al. highlighted the fact that patients presenting episodes of bruxism may present the following personality traits: exploratory, impulsive, extravagant and irritable, pessimistic, fearful, shy and prone to fatigue, critical, aloof, detached and independent, lazy, pampered, underachieving and pragmatic. [67]

The purpose of this study is to highlight the relationship between episodes of bruxism during sleep and personality traits in a group of patients with defined sleep bruxism.

7.2. Material and method

This study took place in the period 2022-2024 and continues the study previously presented in this paper. The study group was formed by identifying those patients who were included in the "probable sleep bruxism" category (positive clinical evaluation+positive self-report) from the group of patients presented in the previous study. After filtering patients according to the inclusion and exclusion criteria, 78 patients were further integrated into the study. The instrumental method of assessing SB was performed using the portable device - Bruxoff, Bioelettronica, Turin, Italy. The CP5F Questionnaire (5-Factor Personality Questionnaire) was used to assess personality traits.

7.3. Results

Table VII.2. Descriptive statistical indices for study group according to parameters recorded using the Bruxoff device

		Bruxism index	Masseter contraction	Examination duration	Average heart rate	Phasic contractions	Tonic contractions	Mixed contractions
N	Valid	78	78	78	78	78	78	78
	Missing	0	0	0	0	0	0	0
Mean		6.2641	87.6667	409.4487	60.5128	13.0000	44.8077	6.7564
Median		6.1000	74.0000	420.0000	61.5000	10.0000	32.0000	6.0000
Std. Deviation		2.28450	84.93491	58.51776	7.93602	9.41262	43.09731	4.30097
Skewness		.272	2.580	-.209	-.336	1.983	1.851	.164
Std. Error of Skewness		.272	.272	.272	.272	.272	.272	.272
Kurtosis		-.653	6.330	-1.219	-.956	3.399	3.219	-.965
Std. Error of Kurtosis		.538	.538	.538	.538	.538	.538	.538
Minimum		2.10	17.00	300.00	45.00	3.00	3.00	.00
Maximum		11.40	401.00	500.00	77.00	43.00	203.00	16.00

Table VII.9. Descriptive analysis of the variables represented by the Rated Score (T) corresponding to desirability and personality traits

		Rated Score (T)					
		Desirability	**Extraversion**	**Amiability**	**Conscientiousness**	**Emotional stability**	**Autonomy**
N	Valid	78	78	78	78	78	78
	Missing	0	0	0	0	0	0
Mean		54.1026	43.0256	53.6026	43.7564	44.3333	52.5897
Median		54.5000	42.0000	52.0000	45.0000	43.0000	52.0000
Std. Deviation		7.14886	11.68635	8.09736	9.57294	11.04144	9.47373
Skewness		.179	.312	.391	.326	.802	-.268
Std. Error of Skewness		.272	.272	.272	.272	.272	.272
Kurtosis		-.400	-1.101	-.249	-.382	.410	.716
Std. Error of Kurtosis		.538	.538	.538	.538	.538	.538
Minimum		39.00	26.00	36.00	25.00	25.00	28.00
Maximum		68.00	67.00	69.00	65.00	71.00	76.00

Table VII.12. The values of the Pearson correlation coefficient (r) between the variables represented by the type of muscle contractions (mm.) masseters and the rated scores (T) for each personality factor (ρ = value of Sig. (2-tailed), * Correlation is significant at the level of 0 .05 (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

Variable - type of contractions mm. masseter	**Variable - rated score (T) for each personality factor**									
	Extraversion		**Amiability**		**Conscientiousness**		**Emotional stability**		**Autonomy**	
	r	**ρ**	**r**	**ρ**	**r**	**ρ**	**r**	**ρ**	**r**	**ρ**
Masseter contractions	-.176	.124	-.012	.914	.059	.608	-.089	.436	-.125	.276
Phasic contractions	.261*	.021	.021	.852	.022	.846	.345**	.002	-.268*	.018
Tonic contractions	.189	.097	-.054	.639	.057	.621	.277*	.014	-.173	.129
Mixed contractions	.114	.322	-.120	.294	.278*	.014	.257*	.023	-.199	.080

7.4. Discussions

Ohlmann et al. did not confirm a consistent correlation between the SB index and masseter contractions, including between the index and phasic, tonic, and mixed contractions. [140]

We did not identify studies using the same type of data collection methods (Bruxoff device and CP5F questionnaire) to be subjected to statistical analysis in our chosen research context. This is the reason why there were not many data to compare with the results obtained in the present study. Most studies in specialized literature are focused on the links between bruxism and the perception of stress, anxiety, depression. [133]

8. Study 3: STUDY OF THE RELATIONSHIP BETWEEN QUALITY OF LIFE AND PERSONALITY TRAITS IN PATIENTS DIAGNOSED WITH DEFINITE SLEEP BRUXISM

8.1. Introduction

Oral health-related quality of life is a multidimensional construct that includes a subjective assessment of an individual's oral health, functional well-being, emotional well-being, expectations and satisfaction with care, and sense of self. [98]

Tay et al. reported that “possible bruxism” is significantly associated with poorer oral health-related quality of life in Asian adults. [145]

The aim of this study is to highlight the relationship between personality traits, quality of life related to oral health status and global quality of life in a group of patients diagnosed with definite sleep bruxism.

8.2. Material and method

The study sample consisted of 78 patients taken from the previous study. Due to the withdrawal of 10 patients during the study, the final group included 68 patients. In order to identify the level of quality of life related to oral health status and global quality of life, the following were used: the OHIP-14 questionnaire and the QOLI form. The research consists of two parts. The first part of the study aimed to collect data regarding the identification of the level of quality of life (global quality of life and quality of life related to oral health status). The second part of the study consisted of carrying out the initial treatment specific to bruxism and identifying after a period of 6 months since the initiation of this treatment phase for the level of quality of life, for both forms. The initial bruxism-specific therapy was carried out as follows: patient awareness, patient counseling, making occlusal guards and applying them during sleep.

8.3. Results

Table VIII.5. The Pearson correlation test for the variables initial OHIP-14 score and bruxism index (**Correlation is significant at the 0.01 level (2-tailed))

		Bruxism Index	Initial OHIP-14 score
Bruxism Index	Pearson Correlation	1	.837**
	Sig. (2-tailed)		.000
	N	68	68
Initial OHIP-14 score	Pearson Correlation	.837**	1
	Sig. (2-tailed)	.000	
	N	68	68

Table VIII.6. Pearson correlation test for bruxism index variables and standardized T QOLI score at baseline (**Correlation is significant at the 0.01 level (2-tailed))

		Bruxism index	Initial standardized T QOLI score
Bruxism Index	Pearson Correlation	1	-.435**
	Sig. (2-tailed)		.002
	N	68	68
Initial standardized T QOLI score	Pearson Correlation	-.435**	1
	Sig. (2-tailed)	.002	
	N	68	68

Table VIII.14. Multivariate regression analysis for the dependent variable final OHIP-14 score and the independent variables: T-scores corresponding to the extraversion, emotional stability, conscientiousness scales

Model		Unstandardized Coefficients		Standardized coefficients	t	Sig.
		B	Standard error	Beta		
1	(Constant)	18.217	4.765		3.823	.000
	Quotas T Conscientiousness	-5.317	1.550	-.350	-3.431	.001
	Quotas T Emotional Stability	-5.935	1.874	-.419	-3.167	.002
	Quotas T Extraversion	-.956	1.721	-.070	-.555	.581

Table VIII.16. Regressive multivariate analysis for the dependent variable final QOLI standardized T score and the independent variables: T-scores corresponding to the extraversion, emotional stability, conscientiousness scales

Model		Unstandardized Coefficients		Standardized coefficients	t	Sig.
		B	Standard error	Beta		
1	(Constant)	50.560	3.309		15.279	.000
	Quotas T Extraversion	2.386	1.076	.247	2.217	.030
	Quotas T Emotional Stability	1.135	1.301	.126	.873	.386
	Quotas T Conscientiousness	3.426	1.195	.394	2.866	.006

8.4. Discussions

We did not identify any studies in the literature that assessed the quality of life for adult patients with definite sleep bruxism using the QOLI inventory, but it was possible to locate one study [155] that analyzed this aspect and that used the Quality Of Life Scale of the World Health Organization (WHOQOL-BREF) and highlighted that SB was not associated with poorer overall quality of life. In the study carried out by us, most of the patients (80.88%) registered an average level of quality of life, and 17.65% a high level. Regarding

the low level, a percentage of 1.47% was identified. No cases were detected that obtained integrable scores for a very low level of quality of life.

No studies were identified in the specialized literature that carried out this type of analysis for the quality of life related to oral health and the parameters recorded for the activity of the masseter muscles during sleep in patients with sleep bruxism.

In a study conducted by Gabriella et al. a significant relationship between "conscientiousness" and "extraversion" and a perceived improvement in oral lichen planus could be observed. According to the study, the higher the degree of "conscientiousness", the better the perceived quality of life related to oral health. In addition, "extraversion" had a significant influence on the improvement of the clinical severity index. The authors concluded that personality traits, especially conscientiousness and extraversion, have a significant impact on the perception of therapeutic intervention in oral lichen planus. [164]

CONCLUSIONS

- Regarding the classification of tooth wear according to severity, moderate and severe tooth wear showed the highest frequency in anterior sextants, posterior sextants presented the mild form of tooth wear, and extreme tooth wear was present in a small number of cases.
- The sextants most affected by occlusal/incisal tooth wear were the anterior sextants, at this level the highest mean scores were recorded, with the dominance of the mandibular anterior sextants compared to the maxillary ones.
- The main soft tissue changes were represented by the linea alba with bilateral localization and the indentations on the left lateral surface of the tongue.
- We found a strongly positive and statistically significant relationship between the number of phasic contractions and the number of tonic and mixed contractions.
- The bruxism index showed a strongly negative, highly significant correlation with extraversion and emotional stability and a highly significant positive correlation with conscientiousness.
- We found a strong negative, highly significant relationship between oral health-related quality of life scores and global quality of life scores. In this context, it should be taken into account that with an increased OHIP-14 score, it means a poorer oral health-related quality of life.
- The increase in the quality of life score related to oral health can be predicted according to the increase in the sleep bruxism index and the number of phasic and mixed contractions of the masseter muscles, and the decrease in this score can be predicted according to the increase in the number of tonic contractions.
- Although the level of global quality of life did not change after the initial SB-specific treatment, changes in weighted satisfaction for the health and self-esteem domains of the QOLI were observed with the increase in the minimum scores and the change in the mean of the weighted scores for the mentioned domains.
- The increase in both forms of quality of life after the start of the initial SB-specific therapy can be predicted according to the increase in T-rated scores (T-quota) on the administration of the CP5F questionnaire for conscientiousness, emotional stability and extraversion.

ORIGINALITY AND INNOVATIVE ASPECT

The elements of originality and innovation are also represented by the creation and use of a modern, complex and multidisciplinary research framework in a current direction of interest, combining the dental field with the psychological field.

The diagnosis of nocturnal bruxism and the evaluation of the changes produced by it in the context of the descriptive parameters of the oral health state represent the needs of many patients who face this phenomenon. Also, assessing the impact that sleep bruxism has on quality of life is particularly important. The connection between sleep bruxism and the personality traits suggested by the results obtained in this research, to which the information found in the specialized literature is added, responds to the challenges arising from the etiological context of sleep bruxism and increases the range of diagnostic and therapeutic approaches to this phenomenon in the area of a multidisciplinary approach , given the neuro-psycho-physiological nature of bruxism, on the one hand, and its effects on oral health as an important component of quality of life, on the other.

BIBLIOGRAPHY

1. Franco AL, de Andrade MF, Segalla JC, Gonçalves DA, Camparis CM. New approaches to dental occlusion: a literature update. Cranio. 2012 Apr;30(2):136-43.
2. Nelson SJ. Wheeler's Dental Anatomy, Physiology And Occlusion 11th Edition, Las Vegas: Elsevier**;** 2019.
3. Phulari GSR. Textbook of Dental Anatomy, Physiology and Occlusion. 2-nd EDITION, London: Jaypee Brothers Medical Publishers; 2019.
4. Warreth A, Ramadan M, Bajilan MR, Ibieyou N, El-Swiah J, Elemam RF. Fundamentals of occlusion and restorative dentistry. Part I: basic principles. J Ir Dent Assoc. 2015 Aug-Sep;61(4):201-8.
5. Buj-Bello A, Morgano SM, Van Blarcom C, Goodacre C, Brown D, Goodacre CJ. The glossary of prosthodontic terms. J Prosthet Dent. 2005 Jul;94(1):10-92.
6. Kumar KP, Tamizharasi S. Significance of curve of Spee: An orthodontic review. J Pharm Bioallied Sci. 2012 Aug;4(Suppl 2):S323-8.
7. Alkhalaf ZA, Sghaireen MG, Issrani R, Ganji KK, Alruwaili NN, Alsaleh RM, Alruwaili MRS, Alabdali MF, Alsirhani MAR, Alam MK. The Effect of Accentuation of Curve of Spee on Masticatory Efficiency-A Systematic Review and Meta-Analysis. Children (Basel). 2023 Mar 4;10(3):511.
8. Shannon K.R., Nanda R.S. Changes in the curve of Spee with treatment and at 2 years posttreatment. *Am. J. Orthod. Dentofac. Orthop.* 2004;125:589–596.
9. Barrera JM, Llamas JM, Espinar E, Sáenz-Ramírez C, Paredes V, Pérez-Varela JC. Wilson maxillary curve analyzed by CBCT. A study on normocclusion and malocclusion individuals. Med Oral Patol Oral Cir Bucal. 2013 May 1;18(3):e547-52.
10. Gupta R, Thakur R, Vashisht D. Mandibular Movements: A Comprehensive Review. Int J Res Health Allied Sci 2021; 7(5): 71-82.
11. Bender ME, Lipin RB, Goudy SL. Development of the Pediatric Temporomandibular Joint. Oral Maxillofac Surg Clin North Am. 2018 Feb;30(1):1-9.
12. Alomar X, Medrano J, Cabratosa J, Clavero JA, Lorente M, Serra I, Monill JM, Salvador A. Anatomy of the temporomandibular joint. Semin Ultrasound CT MR. 2007 Jun;28(3):170-83.
13. Bordoni B, Varacallo M. Anatomy, Head and Neck, Temporomandibular Joint. 2023 Jul 17. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–. PMID: 30860721.
14. Cuccia AM, Caradonna C, Caradonna D. Manual therapy of the mandibular accessory ligaments for the management of temporomandibular joint disorders. J Am Osteopath Assoc. 2011 Feb;111(2):102-12.
15. Mérida-Velasco JR, de la Cuadra-Blanco C, Pozo Kreilinger JJ, Mérida-Velasco JA. Histological study of the extratympanic portion of the discomallear ligament in adult humans: a functional hypothesis. J Anat. 2012 Jan;220(1):86-91.
16. Bravetti P, Membre H, El Haddioui A, Gérard H, Fyard JP, Mahler P, Gaudy JF. Histological study of the human temporo-mandibular joint and its surrounding muscles. Surg Radiol Anat. 2004 Oct;26(5):371-8.
17. Stanley JN, Major MA. Wheeler's dental anatomy, physiology, and occlusion. 9th ed. St. Louis: Elsevier; 2010
18. Dawson PE. Functional Occlusion: From TMJ to Smile Design. St. Louis: Elsevier; 2007
19. Jockusch J, Hahnel S, Sobotta BBAJ, Nitschke I. The Effect of a Masticatory Muscle Training Program on Chewing Efficiency and Bite Force in People with Dementia. Int J Environ Res Public Health. 2022 Mar 22;19(7):3778.
20. Miyawaki S, Ohkochi N, Kawakami T, Sugimura M. Changes in masticatory muscle activity according to food size in experimental human mastication. Journal of oral rehabilitation. 2001 Aug;28(8):778-84.
21. Avivi-Arber L, Sessle BJ. Jaw sensorimotor control in healthy adults and effects of ageing. J. Oral Rehabil., 45(1):50-80, 2018.

22. Morquette P, Lavoie R, Fhima MD, Lamoureux X, Verdier D, Kolta A. Generation of the masticatory central pattern and its modulation by sensory feedback. Prog. Neurobiol., 96(3):340- 55, 2012.
23. Aguirre-Siancas E. Bases neurocientíficas de la función masticatoria y su efecto sobre el estrés y las funciones cognitivas. Rev. Chil. Neuro-Psiquiat., 55(1):9-17, 2017.
24. Reddy SV, Kumar MP, Sravanthi D, Mohsin AH, Anuhya V. Bruxism: a literature review. J Int Oral Health. 2014 Nov-Dec;6(6):105-9.
25. Lobbezoo F., Ahlberg J., Raphael KG, Wetselaar P, Glaros AG, Kato T, Santiago V, Winocur E, Laat AD, Leeuw RD, et al. International Consensus on the Assessment of Bruxism: Report of a Work in Progress. J. Oral Rehabil. 2018;45:837–844.
26. Lobbezoo F, Ahlberg J, Glaros AG, Kato T, Koyano K, Lavigne GJ, de Leeuw R, Manfredini D, Svensson P, Winocur E. Bruxism defined and graded: an international consensus. J Oral Rehabil. 2013 Jan;40(1):2-4.
27. Nadler SC. Bruxism, a classification: critical review. J Am Dent Assoc. 1957 May;54(5):615-22.
28. Ramfjord SP. Bruxism, a clinical and electromyographic study. J Am Dent Assoc. 1961;62:21-44.
29. Ommerborn MA, Giraki M, Schneider C, Fuck LM, Handschel J, Franz M, et al. Effects of sleep bruxism on functional and occlusal parameters: a prospective controlled investigation. Int J Oral Sci. 2012;4(3):141-5.
30. Pavone BW. Bruxism and its effect on the natural teeth. J Prosthet Dent. 1985 May;53(5):692-6.
31. Lobbezoo F, Naeije M. Bruxism is mainly regulated centrally, not peripherally. Journal of Oral Rehabilitation 2001;28: 1085–91.
32. Yap AU, Chua AP. Sleep bruxism: Current knowledge and contemporary management. J Conserv Dent. 2016 Sep-Oct;19(5):383-9.
33. Lobbezoo F, Lavigne GJ, Tanguay R, Montplaisir JY. The effect of catecholamine precursor L-dopa on sleep bruxism: a controlled clinical trial. Mov Disord. 1997;12(1):73-8.
34. Huynh N, Lavigne GJ, Lanfranchi PA, Montplaisir JY, de Champlain J. The effect of 2 sympatholytic medications — propranolol and clonidine — on sleep bruxism: experimental randomized controlled studies. Sleep. 2006;29(3):307-16.
35. Huynh N, Kato T, Rompré PH, Okura K, Saber M, Lanfranchi PA, et al. Sleep bruxism is associated to micro-arousals and an increase in cardiac sympathetic activity. J Sleep Res. 2006;15(3):339-46.
36. Lavigne GJ, Khoury S, Abe S, Yamaguchi T, Raphael K. Bruxism physiology and pathology: an overview for clinicians. J Oral Rehabil. 2008;35(7):476-94.
37. Lavigne GJ, Huynh N, Kato T, Okura K, Adachi K, Yao D, et al. Genesis of sleep bruxism: motor and autonomic-cardiac interactions. Arch Oral Biol. 2007;52(4):381-4.
38. Klasser GD, Rei N, Lavigne GJ. Sleep bruxism etiology: the evolution of a changing paradigm. J Can Dent Assoc. 2015;81:f2.
39. Carra MC, Rompré PH, Kato T, Parrino L, Terzano MG, Lavigne GJ, et al. Sleep bruxism and sleep arousal: an experimental challenge to assess the role of cyclic alternating pattern. J Oral Rehabil. 2011;38(9):635-42.
40. Rintakoski K, Hublin C, Lobbezoo F, Rose RJ, Kaprio J. Genetic factors account for half of the phenotypic variance in liability to sleep-related bruxism in young adults: A nationwide Finnish twin cohort study. Twin Res Hum Genet. 2012;15:714–9.
41. Abe Y, Suganuma T, Ishii M, Yamamoto G, Gunji T, Clark GT, et al. Association of genetic, psychological and behavioral factors with sleep bruxism in a Japanese population. J Sleep Res. 2012;21:289–96.
42. Lobbezoo F, Koyano K, Paesani DA, Manfredini D. Sleep bruxism: diagnostic considerations. In: Kryger MH, Roth T, Dement WC, eds. Principles and Practice of Sleep Medicine, 6th edn. Philadelphia, PA: Elsevier; 2016:1427-1434.

43. Svensson P, Arima T, Lavigne G, Castrillon E. Sleep bruxism: definition, prevalence, classification, etiology and consequences. In: MH Kryger, T Roth, WC Dement, eds. Principles and Practice of Sleep Medicine, 6th ed. Philadelphia, PA*:* Elsevier. 2016; 1423-1426.
44. Shiffman S, Stone AA, Hufford MR. Ecological momentary assessment. Annu Rev Clin Psychol. 2008;4:1-32.
45. Kimball HD. Factors to be considered in the control and elimination of chronic tissue soreness beneath dentures. J Prosthet Dent. 1954;4(3):298–311.
46. Weinberg LA. Rationale and technique for occlusal equilibration. J Prosthet Dent. 1957;14(1):74–86.
47. Levene BF. Occlusion in general practice. J Prosthet Dent. 1957;7:650.
48. Atwood DA. Some clinical factors related to rate of resorption of residual ridges. J Prosthet Dent. 1962;12(3):441–50.
49. Lal SJ, Sankari A, Weber, DDS KK. Bruxism Management. 2024 May 1. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–. Available from: https://www.ncbi.nlm.nih.gov/books/NBK482466/
50. Wetselaar P, Lobbezoo F. The tooth wear evaluation system (TWES): a modular clinical guideline for the diagnosis and management planning of worn dentitions. J Oral Rehabil. 2016;43:69-80.
51. Reding GR, Zepelin H, Robinson JE Jr, Zimmerman SO, Smith VH. Nocturnal teeth-grinding: all-night psychophysiologic studies. J Dent Res. 1968 Sep-Oct;47(5):786-97.
52. Carra MC, Huynh N, Lavigne G. Sleep bruxism: a comprehensive overview for the dental clinician interested in sleep medicine. Dent Clin North Am. 2012 Apr;56(2):387-413.
53. Koyano K, Tsukiyama Y, Ichiki R, Kuwata T. Assessment of bruxism in the clinic. J Oral Rehabil. 2008 Jul;35(7):495-508.
54. Saczuk, K., Lapinska, B., Wilmont, P., Pawlak, L., & Lukomska-Szymanska, M. The Bruxoff Device as a Screening Method for Sleep Bruxism in Dental Practice. Journal of clinical medicine, 2019; *8*(7), 930.
55. Yamaguchi T, Mikami S, Maeda M, Saito T, Nakajima T, Yachida W, Gotouda A. Portable and wearable electromyographic devices for the assessment of sleep bruxism and awake bruxism: A literature review. Cranio. 2020 Sep 1:1-9.
56. Thymi M, Lobbezoo F, Aarab G, Ahlberg J, Baba K, Carra MC, Gallo LM, De Laat A, Manfredini D, Lavigne G, Svensson P. Signal acquisition and analysis of ambulatory electromyographic recordings for the assessment of sleep bruxism: A scoping review. J Oral Rehabil. 2021 Jul;48(7):846-871.
57. Manfredini D, Ahlberg J, Wetselaar P, Svensson P, Lobbezoo F. The bruxism construct: From cut-off points to a continuum spectrum. J Oral Rehabil. 2019 Nov;46(11):991-997.
58. Treede RD, Jensen TS, Campbell JN, Cruccu G, Dostrovsky JO, Griffin JW et al. Neuropathic pain: redefinition and a grading system for clinical and research purposes. Neurology. 2008;70:1630–1635.
59. Raphael KG, Santiago V, Lobbezoo F. Is bruxism a disorder or a behavior? Rethinking the international consensus on defining and grading of bruxism. J Oral Rehabil. 2016a;43:791-798.
60. Manfredini D, Ahlberg J, Aarab G, Bracci A, Durham J, Emodi-Perlman A, Ettlin D, Gallo LM, Häggman-Henrikson B, Koutris M, Peroz I, Svensson P, Wetselaar P, Lobbezoo F. The development of the Standardised Tool for the Assessment of Bruxism (STAB): An international road map. J Oral Rehabil. 2024 Jan;51(1):15-28.
61. Keskinruzgar A, Kucuk AO, Yavuz GY, Koparal M, Caliskan ZG, Utkun M. Comparison of kinesio taping and occlusal splint in the management of myofascial pain in patients with sleep bruxism. J Back Musculoskelet Rehabil. 2019;32(1):1-6.
62. Okeson JP. The effects of hard and soft occlusal splints on nocturnal bruxism. J Am Dent Assoc. 1987 Jun;114(6):788-91.

63. Pierce CJ, Gale EN. A comparison of different treatments for nocturnal bruxism. J Dent Res. 1988 Mar;67(3):597-601.
64. Lobbezoo F, van der Zaag J, van Selms MK, Hamburger HL, Naeije M. Principles for the management of bruxism. J Oral Rehabil. 2008 Jul;35(7):509-23.
65. Blasco-Bonora PM, Martín-Pintado-Zugasti A. Effects of myofascial trigger point dry needling in patients with sleep bruxism and temporomandibular disorders: a prospective case series. Acupunct Med. 2017 Mar;35(1):69-74.
66. Guaita M, Högl B. Current Treatments of Bruxism. Curr Treat Options Neurol. 2016 Feb;18(2):10.
67. Jorgić-Srdjak K, Ivezić S, Cekić-Arambasin A, Bosnjak A. Bruxism and psychobiological model of personality. Coll Antropol 1998; 22 Suppl:205-12.
68. Hsin-Bang L, Wei-Hsian Y, Wei-Kung T, et al. Impact of type D personality on clinical outcomes in Asian patients with stable coronary artery disease. Journal of the Formosan Medical Association. 2019;118:721–729.
69. Harrison-Bernard LM, Augustus-Wallace AC, Souza-Smith FM, Tsien F, Casey GP, Gunaldo TP. Knowledge gains in a professional development workshop on diversity, equity, inclusion, and implicit bias in academia. Adv Physiol Educ. 2020;44(3):286–294.
70. Roberts B.W., Kuneel N.R., Shiner R., Caspi A., Goldberg L.E. The power of personality. Perspectives in Psychological Science. 2007;2:313–345.
71. Ferguson E. Personality is of central concern to understand health: towards a theoretical model for health psychology. Health Psychol Rev. 2013 May;7(Suppl 1):S32-S70.
72. Kang W, Steffens F, Pineda S, Widuch K, Malvaso A. Personality traits and dimensions of mental health. Sci Rep. 2023 May 1;13(1):7091.
73. Hajek A, Bock JO, König HH. The role of personality in health care use: Results of a population-based longitudinal study in Germany. PLoS One. 2017 Jul 26;12(7):e0181716.
74. Novikova IA. Big Five (The Five-Factor Model and The Five-Factor Theory). In: Keith KD, editors. The Encyclopedia of Cross-Cultural Psychology. University of San Diego, USA: John Wiley & Sons Inc; 2013.p. 136–138.
75. Widiger TA, Crego C. The Five Factor Model of personality structure: an update. World Psychiatry. 2019 Oct;18(3):271-272.
76. Sârbescu P, Boncu A. The resilient, the restraint and the restless: Personality types based on the Alternative Five-Factor Model, Personality and Individual Differences. 2018; 134:81-87.
77. Kang W, Steffens F, Pineda S, Widuch K, Malvaso A. Personality traits and dimensions of mental health. Sci Rep. 2023 May 1;13(1):7091.
78. Penke L., Denissen J.J.A., Miller G.F. The evolutionary genetics of personality. European Journal of Personality. 2007;21:549–587.
79. Denissen JJA, Penke L. Motivational individual reaction norms underlying the five-factor model of personality: First steps towards a theory-based framework. Journal of Research in Personality. 2008;42:1285–1302.
80. Roberts BW, Jackson JJ. Sociogenomic personality psychology. Journal of Personality. 2008;76:1523–1544.
81. Van Oers K, de Jong G, van Noordwijk AJ, Kempenaers B, Drent PJ. Contribution of genetics to the study of animal personalities: A review of case studies. Behaviour. 2005;142:1185–1206.
82. Dingmanse NJ, Kazem AJN, Reale D, Wright J. Behavioral reaction norms: Animal personality meets individual plasticity. Trends in Ecology and Evolution. 2010;25:81–89.
83. Chopik WJ, Kitayama S. Personality change across the life span: Insights from a cross-cultural, longitudinal study. J Pers. 2018 Jun;86(3):508-521.
84. Ashton MC. Personality Traits and the Inventories that Measure Them. In: Ashton MC. Editor. Individual Differences and Personality (Second Edition), Academic Press; 2013, p. 27-55.
85. Miclea M, Cotârlea P, Nicule C, Sălăjan R. CAS^{++} Cognitrom assessment system^{++} Manual de utilizare a aplicației CAS^{++}. Cluj-Napoca: ASCR, 2017.

86. Albu M. CP5F: A new questionnaire for the evaluation of the Big Five superfactors. Cognition, Brain, Behavior. An Interdisciplinary Journal. 2009;13. 79-90.
87. Hyphantis T, Antoniou K, Floros D, Valma V, Pappas A, Douzenis A, Assimakopoulos K, Iconomou G, Kafetzopoulos E, Garyfallos G, Kuhlman M. Assessing personality traits by questionnaire: psychometric properties of the Greek version of the Zuckerman-Kuhlman personality questionnaire and correlations with psychopathology and hostility. Hippokratia. 2013 Oct;17(4):342-50.
88. WHOQoL Group. The World Health Organization quality of life assessment (WHOQoL): Position paper from the World Health Organization. Soc Sci Med. 1995;41:1403–09.
89. Baiju RM, Peter E, Varghese NO, Sivaram R. Oral Health and Quality of Life: Current Concepts. J Clin Diagn Res. 2017 Jun;11(6):ZE21-ZE26.
90. Raphael D, Brown I, Renwick R, Rootman I. Quality of life indicators and health: Current status and emerging conceptions. Social Indicators Research, 39(1), 65–88.
91. Locker D. Measuring oral health: A conceptual frame work. Community Dent Health. 1988;5:3–18.
92. Carr AJ, Higginson IJ. Are quality of life measurespatient centered? Brit Med J. 2001;322:1357–60.
93. Varul MZ. Talcott Parsons, the sick role and chronic illness. Body & Society. 2010;16:72–94.
94. Gift HC, Atchison KA, Dayton CM. Conceptualizing oral health and oral health related quality of health. Social Science & Medicine. 1997;44(5):601–08.
95. Locker D, Clarke M, Payne B. Self-perceived oral health status, psychological well-being and life satisfaction in an older adult population. J Dent Res. 2000;79:970–75.
96. Oral health in Americas. Report of the US Surgeon general. National Institute of Dental and Craniofacial Research. National Institute of Health; 2000. Available from: https://www.nidcr.nih.gov/research/data-statistics/surgeon-general
97. Locker D, Matear D, Stephens M, Jokovic A. Oral health-related quality of life of a population of medically compromised elderly people. Community Dent Health. 2002;19:90–97.
98. Sischo L, Broder HL. Oral health related quality of life: what, why, how, and the future implications. *J Dent Res.* 2011; 90:1264–70.
99. Shamrany A. Oral health related Quality of life: a broader perspective. Eastern Mediterranean Health Journal. 2006;12:894–901.
100. Stepanović II, Milić I, Aranđelović M. Assessing quality of life: Current approaches. Acta Medica Medianae 49 (2010): 52-60.
101. Schalock RL. The Concept of Quality of Life: What We Know and Do Not Know. J Intellect Disabil Res 2004; 48(3):203-16.
102. Vagetti GC, Moreira NB, Barbosa Filho VC, de Oliveira V, Cancian CF, Mazzardo O, et al. Domínios da qualidade de vida associados à percepção de saúde: um estudo com idosas de um programa de atividade física em bairros de baixa renda de Curitiba, Paraná. Brasil Cien Saude Colet. 2013; 18(12):3483–93.
103. Frisch MB., Qoli: Quality of life inventory = Inventarul calității vieții: manual și ghid de tratament/Michael B. Frisch; adaptat în România de Raluca Livinți. O.S. România. SINAPSIS, 2014, București
104. Pequeno NPF, Cabral NLA, Marchioni DM, Lima SCVC, Lyra CO. Quality of life assessment instruments for adults: a systematic review of population-based studies. Health Qual Life Outcomes. 2020 Jun 30;18(1):208.
105. Manfredini D, Ahlberg J, Aarab G, Bracci A, Durham J, Ettlin D, Gallo LM, Koutris M, Wetselaar P, Svensson P, Lobbezoo F. Towards a Standardized Tool for the Assessment of Bruxism (STAB)-Overview and general remarks of a multidimensional bruxism evaluation system. J Oral Rehabil. 2020 May; 47(5):549-556.
106. Manfredini D, Ahlberg J, Aarab G, Bracci A, Durham J, Emodi-Perlman A, Ettlin D, Gallo LM, Häggman-Henrikson 487 B, Koutris M, Peroz I, Svensson P, Wetselaar P, Lobbezoo F. The development of the Standardised Tool for the Assessment of Bruxism (STAB): An international road map. J Oral Rehabil. 2022 Oct; 19.

107. Lobbezoo F, Visscher CM, Ahlberg J, Manfredini D. Bruxism and genetics: A review of the literature. J Oral Rehabil. 2014;41:709–14.
108. Rintakoski K, Kaprio J. Legal psychoactive substances as risk factors for sleep-related bruxism: a nationwide Finnish Twin Cohort study. Alcohol Alcohol. 2013 Jul-Aug;48(4):487-94.
109. Melo G, Duarte J, Pauletto P, Porporatti AL, Stuginski-Barbosa J, Winocur E, Flores-Mir C, De Luca Canto G. Bruxism: An umbrella review of systematic reviews. Journal of oral rehabilitation. 2019 Jul;46(7):666-90.
110. Locker D, Slade G. Prevalence of symptoms associated with temporomandibular disorders in a Canadian population. Community Dent Oral Epidemiol. 1988 Oct;16(5):310-3.
111. Cavallo P, Carpinelli L, Savarese G. Perceived stress and bruxism in university students. BMC Res Notes. 2016 Dec 21;9(1):514.
112. Vlăduțu D, Popescu SM, Mercuț R, Ionescu M, Scrieciu M, Glodeanu AD, Stănuși A, Rîcă AM, Mercuț V. Associations between Bruxism, Stress, and Manifestations of Temporomandibular Disorder in Young Students. Int J Environ Res Public Health. 2022 Apr 29;19(9):5415.
113. Flueraşu M.I., Bocşan I.C., Țig I.-A., Iacob S.M., Popa D., Buduru S. The Epidemiology of Bruxism in Relation to Psychological Factors. Int. J. Environ. Res. Public Health. 2022;19:691.
114. Baba K, Haketa T, Clark GT, Ohyama T. Does tooth wear status predict ongoing sleep bruxism in 30-year-old Japanese subjects? Int J Prosthodont. 2004 Jan-Feb;17(1):39-44.
115. Khoury S, Carra MC, Huynh N, Montplaisir J, Lavigne GJ. Sleep Bruxism-Tooth Grinding Prevalence, Characteristics and Familial Aggregation: A Large Cross-Sectional Survey and Polysomnographic Validation. Sleep. 2016 Nov 1;39(11):2049-2056.
116. Manfredini D., Winocur E., Guarda-Nardini L., Paesani D., Lobbezoo F. Epidemiology of Bruxism in Adults: A Systematic Review of the Literature. *J.* Orofac. Pain. 2013;27:99–110.
117. Frosztega W, Wieckiewicz M, Nowacki D, Michalek-Zrabkowska M, Poreba R, Wojakowska A, Kanclerska J, Mazur G, Martynowicz H. Polysomnographic Assessment of Effects of Tobacco Smoking and Alcohol Consumption on Sleep Bruxism Intensity. J Clin Med. 2022 Dec 15;11(24):7453.
118. Lavigne GJ, Lobbezoo F, Rompre PH, Nielsen TA, Montplaisir J. Cigarette smoking as a risk factor or an exacerbating factor for restless legs syndrome and sleep bruxism. Sleep. 1997;20(4):290-293.
119. Frosztega W, Wieckiewicz M, Nowacki D, Poreba R, Lachowicz G, Mazur G, Martynowicz H. The effect of coffee and black tea consumption on sleep bruxism intensity based on polysomnographic examination. Heliyon. 2023 May 12;9(5):e16212.
120. Reding GR, Rubright WC, Zimmerman SO. Incidence of bruxism. J Dent Res. 1966 Jul-Aug;45(4):1198-204.
121. Wetselaar P, Manfredini D, Ahlberg J, Johansson A, Aarab G, Papagianni CE, Reyes Sevilla M, Koutris M, Lobbezoo F. Associations between tooth wear and dental sleep disorders: A narrative overview. J Oral Rehabil. 2019 Aug;46(8):765-775.
122. Pontes LDS, Prietsch SOM. Sleep bruxism: population based study in people with 18 years or more in the city of Rio Grande, Brazil. Rev Bras Epidemiol. 2019;22:e190038.
123. Johansson A, Haraldson T, Omar R, Kiliaridis S, Carlsson GE. A system for assessing the severity and progression of occlusal tooth wear. J Oral Rehabil. 1993 Mar;20(2):125-31.
124. Miranda JS, Barcellos AS, Oliveira AS et al. Are non carious cervical lesion more frequent in sleep bruxism patients? Braz Dent Sci 2017 20: 49–59
125. Zuza A, Racic M, Ivkovic N, Krunic J, Stojanovic N, Bozovic D, Bankovic-Lazarevic D, Vujaskovic M. Prevalence of non-carious cervical lesions among the general population of the Republic of Srpska, Bosnia and Herzegovina. Int Dent J. 2019 Aug;69(4):281-288.
126. Khovidhunkit SP, Songmanee S. Prevalence of cracked tooth in a group of patients at the Faculty of Dentistry, Mahidol University. M Dent J 2014;34:234–42.

127. Bertazzo-Silveira, E., Stuginski-Barbosa, J., Porporatti, A. L., Dick, B., Flores-Mir, C., Manfredini, D., & De Luca Canto, G. (2017). Association between signs and symptoms of bruxism and presence of tori: a systematic review. Clinical Oral Investigations, 21(9), 2789–2799.
128. Iacob, S.M.; Chisnoiu, A.M.; Objelean, A.; Fluerasu, M.I.; Moga, R.R.; Buduru, S.D. Correlation between bruxism, occlusal dysfunction and musculo-articular status. Rom. J. Oral Rehabil. 2022, 14, 48–55.
129. Bârlean L., Danilă I., Podariu A., Săveanu I.C., Ghid de Practică în Prevenția Oro-Dentară, Editor Societatea Română de Ergonomie Dentară, București, 2013, available http://www.cmdrmm.ro/shared/ghiduri/preventie%20si%20ergonomie.pdf
130. Manfredini D, Ahlberg J, Mura R, Lobbezoo F. Bruxism is unlikely to cause damage to the periodontium: findings from a systematic literature assessment. J Periodontol. 2015 Apr;86(4):546-55.
131. Manfredini D, Ahlberg J, Aarab G, Bender S, Bracci A, Cistulli PA, Conti PC, De Leeuw R, Durham J, Emodi-Perlman A, Ettlin D, Gallo LM, Häggman-Henrikson B, Hublin C, Kato T, Klasser G, Koutris M, Lavigne GJ, Paesani D, Peroz I, Svensson P, Wetselaar P, Lobbezoo F. Standardised Tool for the Assessment of Bruxism. J Oral Rehabil. 2024 Jan;51(1):29-58.
132. Masui Y, Gondo Y, Inagaki H, Hirose N. Do personality characteristics predict longevity? Findings from the Tokyo Centenarian Study. Age (Dordr). 2006 Dec;28(4):353-61.
133. Sutin AR, Terracciano A, Ferrucci L, Costa PT Jr. Teeth Grinding: Is Emotional Stability related to Bruxism? J Res Pers. 2010 Jun;44(3):402-405.
134. Montero J, Gómez-Polo C. Personality traits and dental anxiety in self-reported bruxism. A cross-sectional study. J Dent. 2017 Oct;65:45-50.
135. Mogavero MP, Lanza G, Srambi LF, DelRosso LM, Ferri R. Sleep and sleep disorders. In. Reference Module in Neuroscience and Biobehavioral Psychology, Elsevier, 2023, 10-11.
136. Mogavero MP, Mezzapesa DM, Savarese M, DelRosso LM, Lanza G, Ferri R. Morphological analysis of the brain subcortical gray structures in restless legs syndrome. Sleep medicine. 2021 Dec 1;88:74-80
137. Yoshimi H, Sasaguri K, Tamaki K, Sato S. Identification of the occurrence and pattern of masseter muscle activities during sleep using EMG and accelerometer systems. Head Face Med. 2009 Feb 11;5:7.
138. Castroflorio, T.; Deregibus, A.; Bargellini, A.; Debernardi, C.; Manfredini, D. Detection of sleep bruxism: Comparison between an electromyographic and electrocardiographic portable holter and polysomnography. J. Oral Rehabil. 2014, 41, 163–169.
139. Castroflorio, T.; Mesin, L.; Tartaglia, G.M.; Sforza, C.; Farina, D. Use of electromyographic and electrocardiographic signals to detect sleep bruxism episodes in a natural environment. IEEE J. Biomed. Heal. Informatics 2013, 17, 994–1001.
140. Ohlmann B, Bömicke W, Behnisch R, Rammelsberg P, Schmitter M. Variability of sleep bruxism-findings from consecutive nights of monitoring. Clin Oral Investig. 2022 Apr;26(4):3459-3466.
141. Lavigne GJ, Kato T, Kolta A, Sessle BJ. Neurobiological mechanisms involved in sleep bruxism. Crit Rev Oral Biol Med. 2003;14(1):30-46.
142. Wieczorek T, Jodkowska A, Orzeszek S, Wieckiewicz M, Michalek-Zrabkowska M, Mazur G, Rymaszewska J, Smardz J, Wojakowska A and Martynowicz H (2024) Why am I grinding and clenching? Exploration of personality traits, coping strategies, oral parafunctional behaviors, and severe sleep bruxism in a polysomnographic study. Front. Psychiatry 15:1362429.
143. Caspi A, Roberts B, Shiner R. Personality development: stability and change. Annu Rev Psychol. 2005;56:453–484.
144. Câmara-Souza MB, de Figueredo OMC, Rodrigues Garcia RCM. Association of sleep bruxism with oral health-related quality of life and sleep quality. Clin Oral Investig. 2019 Jan;23(1):245-251.

145. Tay KJ, Ujin YA, Allen PF. Impact of sleep bruxism on oral health-related quality of life. Int J Prosthodont. 2020;33(3):285–291.
146. Yıldırım G, Erol F, Güven MC, Şakar O. Evaluation of the effects of bruxism on oral health-related quality of life in adults. Cranio. 2023 May;41(3):230-237.
147. Turcio KH, Neto CM, Pirovani BO, Dos Santos DM, Guiotti AM, Bertoz AM, Brandini DA. Relationship of bruxism with oral health-related quality of life and facial muscle pain in dentate individuals. J Clin Exp Dent. 2022 May 1;14(5):e385-e389.
148. Campos L.A., Peltomäki T., Marôco J., Campos J.A.D.B. Use of Oral Health Impact Profile-14 (OHIP-14) in Different Contexts. What Is Being Measured? Int J Environ Res Public Health. 2021 Dec 20;18(24):13412.
149. Slusanschi O, Moraru R, Garneata L, Mircescu G, Cuculescu M, Preoteasa E. Validation of a Romanian version of the short form of the oral health impact profile (OHIP-14) for use in an urban adult population. Oral Health Prev Dent. 2013;11(3):235-42.
150. Beddis H, Pemberton M, Davies S. Sleep bruxism: an overview for clinicians. Br Dent J. 2018;225(6):497–501.
151. Thomson WM, Caspi A, Poulton R, Moffitt TE, Broadbent JM. Personality and oral health. European Journal of Oral Sciences. 2011; 119(5), 366–372.
152. Mercan Başpınar M, Mercan Ç, Mercan M, Arslan Aras M. Comparison of the Oral Health-Related Quality of Life, Sleep Quality, and Oral Health Literacy in Sleep and Awake Bruxism: Results from Family Medicine Practice. Int J Clin Pract. 2023 Sep 30;2023:1186278.
153. Duarte J, Pauletto P, Massignan C, Bolan M, Domingos FL, Hallal ALC, De Luca Canto G. Association Between Sleep Bruxism and Quality of Life: A Systematic Review. J Oral Facial Pain Headache. 2020 Fall;34(4):341-352.
154. Papagianni CE, van der Meulen MJ, Naeije M, Lobbezoo F. Oral health–related quality of life in patients with tooth wear. J Oral Rehabil 2013;40:185–190.
155. Lucchesi LM, Speciali JG, Santos-Silva R, Taddei JA, Tufik S, Bittencourt LR. Nocturnal awakening with headache and its relationship with sleep disorders in a population-based sample of adult inhabitants of São Paulo City, Brazil. Cephalalgia 2010;30:1477–1485
156. Wieckiewicz M, Martynowicz H, Lavigne G, Kato T, Lobbezoo F, Smardz J, Ahlberg J, Winocur E, Emodi-Perlman A, Restrepo C, Wojakowska A, Gac P, Mazur G, Waliszewska-Prosol M, Swienc W, Manfredini D. Moving beyond bruxism episode index: Discarding misuse of the number of sleep bruxism episodes as masticatory muscle pain biomarker. J Sleep Res. 2024 Aug 12:e14301.
157. Slade GD, Spencer AJ. Development and evaluation of the oral health impact profile. Community Dent Health. 1994;11:03–11.
158. Macedo CR, Silva AB, Machado MA, Saconato H, Prado GF. Occlusal splints for treating sleep bruxism (tooth grinding). Cochrane Database Syst Rev. 2007 Oct 17;2007(4).
159. Lavigne GJ, Manzine C. Bruxism. In: Kryger MH, Roth T, Dement WC editor(s). Principles and practice of sleep medicine. 3rd Edition. Philadephia: WB Saunders, 2000;773-85.
160. Huang IC, Lee JL, Ketheeswaran P, Jones CM, Revicki DA, Wu AW. Does personality affect health-related quality of life? A systematic review. PLoS One. 2017 Mar 29;12(3):e0173806.
161. Friedman B, Veazie PJ, Chapman BP, Manning WG, Duberstein PR. Is personality associated with health care use by older adults? Milbank Q. 2013 Sep;91(3):491-527.
162. Borghans L, Duckworth AL, Heckman JJ, Ter Weel B. The economics and psychology of cognitive and non-cognitive traits. Journal of Human Resources. 2008 Jan;43(4):972-1059.
163. Deary IJ, Weiss A, Batty GD. Intelligence and Personality as Predictors of Illness and Death: How Researchers in Differential Psychology and Chronic Disease Epidemiology Are Collaborating to Understand and Address Health Inequalities. Psychol Sci Public Interest. 2010 Aug;11(2):53-79.
164. Gabriella D, Klemens R, Xiao-Hui RF, Corinna B, Eva H. Effect of personality traits on the oral health-related quality of life in patients with oral lichen planus undergoing treatment. Clin Oral Investig. 2021 Apr;25(4):2381-2389.