

THE RELATIONSHIP BETWEEN ANXIETY AND BRUXISM: A SYSTEMATIC REVIEW

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Abstract: This is a literature review aiming to identify the relationship between anxiety and bruxism, discussing both and their association. An electronic search was carried out in the Pubmed and Epistemonikos databases, with the descriptors: (Stress) AND (bruxism), (Anxiety) AND (Bruxism) and (Dental Stress Analysis) AND (bruxism). The literature demonstrates that the correlation between anxiety and bruxism is significant, however, there is a need to carry out more studies that address the association in a standardized and outlined way. Most of the studies included in this review showed that individuals with a high level of anxiety develop bruxism while awake, compared to bruxism during sleep. The prevalence of this disorder in women is also identified, but children and adolescents continue to have a high rate of development due to various factors, whether psychological or behavioral. In addition to anxiety, other previous factors were cited as corroborating the development of bruxism, the most cited were: depression, stress, genetics, smoking and excessive alcohol use. As a treatment, occlusal appliances continue to be effective for managing bruxism. Finally, the relationship between the two is positive, and investigation into the cause must be carried out and combined with multidisciplinary treatment, which is often psychological.

Keywords: Anxiety, Bruxism, Stress.

INTRODUCTION

The Greek term “brygmos” gives rise to the word “bruxism” and this in turn is characterized as a parafunctional activity of the masticatory muscles. The main factor being the habit of clenching your teeth in an unphysiological way. It is considered a musculoskeletal malfunction of the stomatognathic system whose main point is the intensity and constant repetition of the habit of grinding teeth. Its meaning has been

updated over the years in light of the evolution of its studies (Couto 2016).

Studies indicate that emotional disorders such as anxiety and stress are etiological factors of this change, which trigger bruxism during sleep. The degree of intensity, duration of the habit and number of affected teeth are essential for the onset of painful symptoms (Seraj et al., 2010). Early diagnosis of this dysfunction is essential so that a more serious condition of this change can be avoided, as this disorder has the potential for serious dental changes and compromise.

Anxiety is one of the mental disorders that most affects human beings, it is characterized by an affliction that refers to the feeling of imminent danger, causing a certain type of anguish and apprehension. The increase in the prevalence of this psychological disorder comes from the stressful factors imposed by society. Increased tone in the head and neck muscles causes parafunctional habits and is the main consequence of anxiety (Garcia et al., 2009). Gungormus and Ercyas (2009) claimed a greater relationship with a higher degree of anxiety and depression in patients with bruxism when compared to patients who do not have bruxism. The authors state that there is an association between bruxism and more intense degrees of anxiety and/or depression in patients with TMD (temporomandibular disorder).

In a clinical context, it is possible to observe that bruxism patients complain of worsening of their condition when they are in phases of anxiety, stress, worry or situations in which they are placed under pressure. These factors generate greater daily clenching activity due to the tense and unconscious mental state, thus making bruxism a frequent condition in your routine, contributing to an impaired quality of life, given that there is the presence of frequent painful symptoms, headaches, mild to severe tooth wear and the like.

The current condition of society favors the prevalence of more anxious people, therefore, the study of the relationship between anxiety and bruxism is of utmost importance. Since, those with this condition are unlikely to be able to detect this factor at the beginning, meaning that the degree of damage often has to reach a severe level for it to seek appropriate treatment. Therefore, this work aims to address the relationship between anxiety and sleep bruxism, through a literature review discussing the condition and current forms of treatment.

MATERIAL AND METHODS

This article was carried out through the evaluation of published studies, in the Pubmed and Epistemonikos databases, between the periods of 2016 and 2021. Studies that had a cross-sectional design outside the scope of the study were excluded. Studies were used with the search strategy using the descriptors (Stress) AND (bruxism), (Anxiety) AND (Bruxism) and (Dental Stress Analysis) AND (bruxism). Furthermore, other important references from books and other academic works were used in a complementary manner. (Table 1 and tables 1 and 2).

DISCUSSION

Souza et al. (2020) do not agree with Polmann et al. (2019) on the total relationship between generic anxiety symptoms and Bruxism. Their studies indicated the prevalence of bruxism and sleep. Polmann et al. (2019) also state that there is little literature on the possible role of sleep bruxism in different anxiety spectrum disorders.

The authors Tecco and Tecco (2020), Ertugrul et al. (2018), Chin et al. (2018) agree regarding the use of medications to improve the level of bruxism. However, the authors carried out research with different medications such as pregabalin (TECCO and TECCO,

2020) and methylphenidate (Ertugrul et al., 2018). The effects of these medications and their usage protocol are different; there is also nothing to compare in terms of results between these drugs.

Polmann et al. (2019) and Chemelo et al. (2020) disagree among themselves regarding the influence of anxiety symptoms on sleep bruxism. Chemelo et al. (2020) confirms and also addresses in his study that smoking, gastroesophageal reflux disease, sleep apnea, genetics and behavior, excessive alcohol and depression also act as risk factors for the development of sleep bruxism.

There is no consensus between Rios et al. (2018) and Manfredini et al. (2017) on the relationship between emotional factors and bruxism. Rios et al. (2018) also mentions that emotional factors (accumulation of tasks, losses, expectations, self-image conflicts, self-esteem and anxiety) influence the development of bruxism. There is agreement between Melo et al. (2019), Owczarek et al. (2020), Polmann et al. (2019) and Chemelo et al. (2020) regarding the immense need for well-designed studies, with standardized methodologies, with representative and clinical samples to analyze associations of some mental and emotional disorders with bruxism. Polmann et al. (2019) state that despite the limitations of available evidence, some symptoms appear to be associated with sleep bruxism in adults, such as sensitivity to stress, anxious expectation and anxiety panic symptoms.

Melo et al. (2019) and Tecco (2020) disagree with each other regarding the use or use of medications to improve the level of bruxism. Melo et al. (2019) states that occlusal appliances are considered consistently effective for managing bruxism. No recommendations for pharmacological treatments.

There is disagreement between Melo et al. (2019), Pontes and Prietsch (2019) and

Pubmed	Epistemonikos
(Stress) AND (bruxism) (n = 115)	(Stress) AND (bruxism) (n = 5)
(Anxiety) AND (bruxism) (n = 81)	(Anxiety) AND (bruxism) (n = 9)
(Dental Stress Analysis) AND (bruxism) (n = 21)	(Dental Stress Analysis) AND(bruxism) (n = 65)
Deleted due to duplicity (n = 3)	Deleted due to duplicity (n = 5)
Selected for summary reading (n = 12)	Selected for summary reading (n = 8)
Excluded (n = 3)	Excluded (n = 2)
Studies included in the review (n = 9)	Studies included in the review (n = 6)
Total studies included in the review (n = 15)	

Table 1 - Databases

Authors/Year	Methodology	Result/Outcome
Polmann, H., Domingos, F. L., Melo, G., Stuginski-Barbosa, J., da Silva Guerra, E. N., Porporatti, A. L., ... De Luca Canto, G. (2019)	Through questionnaires, clinical examinations and polysomnography, a systematic review was carried out where these were included together with seven main databases. The risk of bias assessment was carried out using Joanna, for cross-sectional analyzes the Briggs Institute critical assessment was used in addition to cumulative evidence.	After selecting cross-sectional studies, articles and assessment methods for Sleep Bruxism in relation to anxiety, it was concluded that the literature is controversial regarding the association between the two pillars despite demonstrating that some symptoms may be related between the two.
Tecco JM, Tecco S. (2020)	The study analyzed the case of a 21-year-old woman who presented mood changes linked to a high level of anxiety and complained of bruxism upon waking up. Intelligence assessment was used using the Wechsler Adult intelligence scale - Fourth Edition (WAIS-IV). Attention deficit hyperactivity disorder (ADHD) investigated through neuro psychology testing.	Daily doses of 375 mg of Pregabalin were used to reduce the level of anxiety, which culminated in a reduction in daytime bruxism. Studies are needed to observe the long-term effect in relation to sleep bruxism.
Demjaha G, Kapusevska B, Pejkovska-Shahpaska B. (2019)	The Literature Review was carried out through internet research using information from the following databases: Research gate, Pubmed, ScienceDirect. Two hundred articles were analyzed, forty-five articles and two textbooks were used to compose the study.	The consequences of Bruxism are severe for the quality of life of those who suffer from it. This parafunctional habit and its prevalence is increasing due to stress, routine problems, poor diet and lifestyle changes. A multidisciplinary approach is necessary, so that there is prevention of dental damage and psychological treatment, seeking solutions and ensuring a viable treatment plan for the case.
Tavares LM, da Silva Parente Macedo LC, Duarte CM, de Goffredo Filho GS, de Souza Tesch R.(2016)	One hundred and eighty-one patients aged between 19 and 77 years were selected, those who sought care at the TMD and Orofacial pain outpatient clinic of the Faculty of Dentistry of Petrópolis. Questionnaires, clinical examinations, and the components of the RDC/TMD were applied.	Through the evaluation between the relationship between anxiety and bruxism, analyzing one hundred and eighty-one female patients who had Temporomandibular Disorder, a positive relationship was observed between anxiety symptoms and daytime bruxism, but not patients who reported sleep bruxism.
Kuhn M, Türp JC.2018	The study discussed a sum of risk factors linked to Bruxism that were found by a systematic search of published literaturebetween 2007 and 2016.	Among adults, the habits found were emotional stress, coffee, tobacco, alcohol, sleep apnea and anxiety. In children, the biggest factors were distress, behavioral abnormalities and sleep disorders. Knowing the risk factors is an excellent strategy for diagnosing and treating Bruxism.
Pontes LDS, Prietsch SOM.2019	A population-based study was carried out by evaluating 1280 people over the age of 18 and living in urban areas, using a questionnaire based on the diagnostic criteria of the International Classification of Sleep Disorders.	Signs and symptoms suggestive of sleep bruxism were found, such as tooth wear and pain in the facial muscles. Psychological stress was a risk factor for dysfunction, with a prevalence of bruxism and damage to the structures of the stomatognathic system.

Owczarek JE, Lion KM, Radwan-Oczko M.(2020)	The methodology used was through psychological and health questionnaires in addition to a stomatology examination with electromyography of the masseter muscles, applied to first-year physiotherapy and dentistry students at the University School of Physical Education in Wroclaw and the Wroclaw Medical University.	Stress levels were observed in both. Levels of anxiety and stress were higher in the group of dentistry students and thus there is a tendency to increase the tone of the masseter muscle according to the reported indicators, depression, stress and anxiety.
Rofael M, Chow JC, Cioffi I.2020	Through a survey carried out on the web, two hundred and fifty-five individuals were allocated into groups of low AT (<20th percentile of the AT score distribution), intermediate (between 20th and 80th) and high (>80th). The electromyographic activity of the right masseter and postural activity were tested.	The objective was to measure masseter activity and the intensity and duration of episodes of clenching in people with different levels of trait anxiety. Increased levels of trait anxiety are associated with increased masseter activity as well as teeth clenching during waking hours.
Manfredini D, Serra-Negra J, Carboncini F, Lobbezoo F. 2017	Through a summary evaluating articles on the topic, the study carried out a sum of concepts and explanation of the most variants of bruxism and its appropriate treatment.	Bruxism disorder is found in different age groups, with biological, psychological and exogenous factors as the main suggestion for worsening. Sensitivity to stress and anxiety levels may be responsible for the activity of this dysfunction. A multidisciplinary approach is recommended, so that a preventive approach can be taken to resolve and minimize damage.

TABLE 1 - PUBMED

Authors/Year	Methodology	Result/Outcome
Rios, Lisandra Teixeira, Aguiar, Valdelya Nara Pereira, Machado, Fernanda Campos, Rocha, Cristiane Tomaz, Neves, Beatriz Gonçalves (2018)	Data were collected in the databases: PubMed, VHL Virtual Health Library and SciELO from February 2007 to September 2017. The descriptors used were “bruxism”, “children”, “stress”, “anxiety” and “factors psychological.” Thus, 97 publications were identified in the initial search. After applying the inclusion and exclusion criteria, the final sample consisted of seven studies.	The studies resulted in significant evidence of an association between anxiety and psychological factors and childhood bruxism. however, there is still a great need for well-designed studies with standardized methodologies to verify the association between bruxism and psychological factors.
Melo G, Duarte J, Pauletto P, Porporatti AL, Stuginski-Barbosa J, Winocur E - (2019)	Searches were conducted in seven main electronic databases and a partial gray literature search in three databases. The risk of bias of included Systematic Reviews was assessed using the “University of Bristol tool for assessing the risk of bias in systematic reviews.”Of 1,038 studies, 41 Systematic Reviews were included.	The study of these systematic reviews showed that 1) among adults, the prevalence of BA was 22-30%, SB (1-15%) and BS among children and adolescents (3-49%); 2) factors consistently associated with bruxism were the use of alcohol, caffeine, tobacco, some psychotropic medications, esophageal acidification and secondhand smoke; Signs and symptoms of temporomandibular disorder showed a plausible association; 3) portable diagnostic devices presented higher overall specificity (0.83-1.00) and sensitivity (0.40-1.00) values; 4) bruxism can result in biomechanical complications in relation to dental implants, however, the evidence was inconclusive in relation to other dental restorations and periodontal impact; 5) occlusal appliances were considered effective for controlling bruxism. higher overall specificity (0.83-1.00) and sensitivity (0.40-1.00) values; 4) bruxism can result in biomechanical complications in relation to dental implants, however, the evidence was inconclusive in relation to other dental restorations and periodontal impact; 5) occlusal appliances were considered effective for controlling bruxism.

<p>Chemelo VDS, Ne YGDS, Frazao DR, Souza-Rodrigues RDD, Lima RR, Fagundes NCF (2020)</p>	<p>Observational studies in adults with and without the presence of stress were evaluated to verify the association with bruxism. Risk of bias was assessed using the Joanna Briggs Institute Critical Appraisal Tools for Analytical Cross-Sectional Studies. In the quantitative analysis, the Odds Ratio (OR) and its 95% confidence interval (CI) were calculated using a fixed effect model. Furthermore, a summary of the overall strength of evidence was presented using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE). A total of 1,458 studies were identified, and only six were included in this systematic review.</p>	<p>As results, two of the included studies were classified as low risk of bias and the others were classified as moderate risk of bias. In three articles, a meta-analysis was performed and showed an association between these two factors (OR 2.07 [1.51, 2.83], $p < 0.00001$, $I^2 = 45\%$). With the studies, low certainty of evidence in this association was detected. Stressed individuals are more likely to experience bruxism when compared to healthy individuals.</p>
<p>Brondani B, Knorst JK, Tomazoni F, Dutra Costa M, Vargas AW, Noronha TG (2021)</p>	<p>This study aimed to evaluate psychosocial and behavioral changes related to oral health in adolescents immediately before and during the COVID-19 pandemic period. 290 adolescents were assessed from November 2019 to February 2020 (T1-before the pandemic in Brazil) and from June to July 2020 (T2) in southern Brazil. Sociodemographic, behavioral and psychosocial variables were measured before and during the pandemic. Factors related to social distancing and unemployment were also taken into consideration. Differences between variables at T1 and T2, as well as the effect of social distancing, were assessed using a multilevel logistic regression model adjusted for repeated measures.</p>	<p>This study resulted in the reevaluation of 207 adolescents at T2 (71.3% response rate). During the pandemic, the frequency of tooth brushing, the use of dental services and the self-perception of the need for dental treatment decreased significantly. Sugar consumption, bruxism and sleep quality did not change significantly.</p>
<p>Souto-Souza D, Mourão PS, Barroso HH, Douglas-de-Oliveira DW, Ramos-Jorge ML, Falci SGM - (2020)</p>	<p>This study aimed to assess whether children and adolescents with attention deficit/hyperactivity disorder (ADHD) are more likely to develop bruxism compared to individuals without this disorder. Observational studies that evaluated the presence of bruxism in children with this disorder were included. The quality of evidence was assessed using the Recommendations Rating, Assessment, Development, and Evaluation criteria. Thirty-two studies involving a total of 2629 children/adolescents with ADHD and 1739 with bruxism (1629 with sleep bruxism and 110 with awake bruxism) were included. and 1739 with bruxism (1629 with sleep bruxism and 110 with awake bruxism) were included.</p>	<p>As a result of this study, children and adolescents diagnosed with ADHD have a greater chance of developing sleep-wake bruxism than those without this disorder. The prevalence of bruxism, regardless of the type, in children/adolescents was 31% (95% CI: 0.22-0.41, $I^2 = 93\%$). ADHD was associated with an increased odd of bruxism (OR: 2.94, 95% CI: 2.12-4.07, $I^2 = 61\%$), regardless of the type [sleep bruxism (OR: 2.77, CI 95%: 1.90-4.03, $I^2 = 66\%$) or awake bruxism (OR: 10.64, 95% CI: 2.41-47.03, $I^2 = 65\%$)]. The presence of signs of ADHD without diagnostic confirmation was not associated with an increased chance of bruxism (OR: 3.26, 95% CI: 0.76-14.04, $I^2 = 61\%$).</p>

TABLE 2 - EPISTEMONIKOS

Demjaha et al. (2019) regarding the age range of sleep bruxism prevalence. Melo et al. (2019) state that there is a higher prevalence in children and adolescents than in adults. While Pontes and Prietsch (2019) demonstrate that people over 40 years of age have a higher prevalence. Demjaha et al. (2019) points out that there is a high frequency of bruxism in all age groups.

Teixeira et al. (2018), Melo et al (2019), Kunh and Turp (2018) and Souza et al. (2020) agree with each other regarding the association of psychological factors related to childhood bruxism. Souza et al. (2020) also state that children and adolescents diagnosed with Attention Deficit Hyperactivity Disorder are more likely to develop bruxism compared to those who do not have this disorder. Melo et al (2019) and Kunh and Turp (2018) point out that the main factors associated with bruxism in children and adolescents are behavioral and sleep disorders.

The authors Melo et al (2019) and Kunh and Turp (2018) agree on the relationship between bruxism in adults and its risk factors such as: consumption of tobacco, alcohol, caffeine. Point out Melo et al. (2019) furthermore, that several temporomandibular disorders have a plausible association with sleep bruxism.

There is agreement between Demjaha et al. (2019) and Rofael et al. (2020) in relation to prevention as a basic measure in the treatment of bruxism. Demjaha et al. (2019) states that

prevention avoids the risk of various oral diseases and their complications appearing, which improves the patient's life.

There is disagreement between Demjaha et al (2019) and Tavares et al. (2016) regarding the association of sleep bruxism and anxiety. Demjaha et al. (2019) believes that in addition to anxiety, sleep bruxism is also associated with stress, medications and sleep disorders.

CONCLUSION

Through the articles analyzed, it is possible to establish that there is a relationship between anxiety and bruxism. Despite finding a significant association between the two factors in a generalized way, the studies indicate that it is still necessary to carry out more research, which uses a better design and standardization of methodologies. Aiming for greater specificity regarding the correlation between the two and seeking to discuss the physiological and behavioral understanding of the association between anxiety and bruxism. Since, in current times, society finds itself with high levels of anxiety and stress, developing bruxism more frequently and seeking treatment when the level of impairment is high. Therefore, understanding the topic is highly relevant for scientific, professional and population knowledge. Aiming that the treatments of occurring cases are carried out in an effective, specific and multidisciplinary way.

REFERENCES

1. BRONDANI, B. et al. **Effect of the COVID-19 pandemic on behavioral and psychosocial factors related to oral health in adolescents: a cohort study.** *International Journal of Paediatric Dentistry*, v. 00, p. 1-8, 2021.
2. CHEMELO, V. D. S. et al. **Is There Association Between Stress and Bruxism? A Systematic Review and Meta-Analysis.** *Frontiers in Neurology*, v. 11, p. 590779, 2020.
3. DEMJAHA, G. et al. **Bruxism: Unconscious Oral Habit in Everyday Life.** *Open Access Macedonian Journal of Medical Sciences*, v. 7, n. 5, p. 876-881, 2019.
4. KUHN, M.; TURP, J. C. **Risk factors for bruxism.** *Swiss Dental Journal*, v. 128, p. 118-124, 2018.
5. MANFREDINI, D. et al. **Current Concepts of Bruxism.** *Internacional Journal of Prosthodontics*, v. 30, p. 437-438, 2017.
6. MELO, G. et al. **Bruxism: An umbrella review of systematic reviews.** *Journal of Oral Rehabilitation*, v. 46, p. 666-690, 2019.
7. OWCZAREK, J. E. et al. **The impact of stress, anxiety and depression on stomatognathic system of physiotherapy and dentistry first-year students.** *Brain and Behavior*, v. 00, p. e01797, 2020.
8. POLMANN, H. et al. **Association between sleep bruxism and anxiety symptoms in adults: A systematic review.** *Journal of Oral Rehabilitation*, v. 46, p. 482-491, 2019.
9. PONTES, L. S.; PRIETSCH, S. O. M. **Sleep bruxism: population-based study in people with 18 years or more in the city of Rio Grande, Brazil.** *Revista Brasileira de Epidemiologia*, v. 22, p. E190038, 2019.
10. RIOS, L. T. et al. **Bruxismo infantil e sua associação com fatores psicológicos – revisão sistemática da literatura.** *Revista Odontológica da Universidade*. Cidade de São Paulo, v. 30, n. 1, p. 64-76, 2018.
11. ROFAEEL, M. et al. **The intensity of awake bruxism episodes is increased in individuals with high trait anxiety.** *Clinical Oral Investigations*, v. 25, p. 3197-3206, 2021.
12. SOUTO-SOUZA, D. et al. **Is there an association between Attention Deficit Hyperactivity Disorder in children and adolescents and the occurrence of Bruxism? A systematic review and meta-analysis.** *Sleep Medicina Reviews*, v. 53, p. 101330, 2020.
13. TAVARES, L. M. F. et al. **Cross-sectional study of anxiety symptoms and self-report of awake and sleep bruxism in female TMD patients.** *Cranio: The Journal of Craniomandibular & Sleep Practice*, p. 378-381, 2016.
14. TECCO, J. M.; TECCO, S. **Awake bruxism treated with pregabalin in a patient with generalized anxiety disorder.** *Psychiatria Danubina*, v. 32, Suppl. 1, p. 33-35, 2020.