

GÓRA, Agnieszka, LASKOWSKI, Gustaw, WĘGRZYN, Piotr, WĘGRZYN, Konstancja, SALIŃSKA, Anna, WASILEWSKI, Marcin, NOWICKI, Maciej, SKWARA, Julia, BARAŃSKI, Dawid and DĄBROWSKA, Natalia. Diagnosis and management of bruxism. A literature review. *Quality in Sport*. 2024;22:54807. eISSN 2450-3118.

<https://dx.doi.org/10.12775/QS.2024.22.54807>

<https://apcz.umk.pl/QS/article/view/54807>

The journal has been 20 points in the Ministry of Higher Education and Science of Poland parametric evaluation. Annex to the announcement of the Minister of Higher Education and Science of 05.01.2024. No. 32553.

Has a Journal's Unique Identifier: 201398. Scientific disciplines assigned: Economics and finance (Field of social sciences); Management and Quality Sciences (Field of social sciences).

Punkty Ministerialne z 2019 - aktualny rok 20 punktów. Załącznik do komunikatu Ministra Szkolnictwa Wyższego i Nauki z dnia 05.01.2024 r. Lp. 32553. Posiada Unikatowy Identyfikator Czasopisma: 201398.

Przypisane dyscypliny naukowe: Ekonomia i finanse (Dziedzina nauk społecznych); Nauki o zarządzaniu i jakości (Dziedzina nauk społecznych).

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The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 01.09.2024. Revised: 13.09.2024. Accepted: 16.09.2024. Published: 17.09.2024.

Diagnosis and management of bruxism. A literature review

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ABSTRACT

Bruxism, characterized by involuntary grinding or clenching of teeth, is a widespread condition with multifaceted implications for oral health, physical well-being, and quality of life. This comprehensive review aims to provide an in-depth study of bruxism, encompassing its definition, classification, etiology, pathophysiology, clinical manifestations, and consequences. Bruxism is classified based on its timing (sleep bruxism or awake bruxism). The etiology of bruxism is multifactorial, involving physiological factors such as central nervous system (CNS) pathways, sleep disorders, and occlusal factors, as well as psychological factors like stress, anxiety, personality traits and environmental factors including medications, substances, and stressors. Clinically, bruxism can result in various dental consequences, including tooth wear, fractures and damage to restorations, as well as temporomandibular disorders (TMDs) such as myofascial pain. These manifestations can negatively impact individual's oral health, physical well-being, and overall quality of life. Management strategies include behavioral and lifestyle changes, oral appliances, dental treatments for tooth damage, and, in certain instances, pharmacological interventions. While the current understanding of bruxism has advanced, further research is needed to fully elucidate its etiology, pathophysiology, and effective management strategies.

Keywords: bruxism; sleep bruxism; teeth grinding; clenching

INTRODUCTION AND PURPOSE

Bruxism has been defined as a repetitive jaw-muscle activity characterized by clenching or grinding of the teeth and/or by bracing or thrusting of the mandible. Bruxism can manifest as sleep-related bruxism, occurring during sleep, or awake bruxism, taking place while an individual is awake and conscious.¹ It is a widespread phenomenon, affecting people of all ages, genders, and backgrounds. The consequences can be far-reaching, impacting an individual's oral health, physical well-being, and quality of life. These complications include tooth wear, jaw pain, headaches, and disrupted sleep patterns. Bruxism can also result in temporomandibular joint disorders and damage to dental restorations. Understanding the causes, effects, and treatment of bruxism is essential for dental professionals to effectively manage and prevent further complications. This paper aims to provide an in-depth study of bruxism, encompassing its definition, classification, etiology, clinical manifestations, diagnostic approaches, and management strategies.

THE STATE OF KNOWLEDGE

Bruxism can be classified based on the timing of its occurrence.² Sleep bruxism refers to the involuntary teeth grinding or clenching during sleep. It is considered a sleep-related movement disorder.³ Awake bruxism involves the involuntary teeth grinding or clenching during wakefulness.⁴ It is important to note that sleep bruxism and awake bruxism can coexist in some cases. Sleep bruxism can further be classified into primary and secondary bruxism. Primary bruxism is not associated with any underlying medical condition, while secondary bruxism is caused by other factors such as medication or medical disorders.⁵

Etiology

The etiology of bruxism is multifactorial, with various physiological, psychological, and environmental factors contributing to its development and perpetuation. While the exact mechanisms underlying bruxism are not fully understood, several theories have been proposed to explain its origin.^{6,7}

Stress, anxiety and depression are widely recognized as major factors contributing to the prevalence of bruxism in both children and adults.⁹ Disturbances in the dopaminergic and serotonergic systems in the central nervous system are thought to play a role. Additionally, studies have indicated that certain neurological conditions, including Parkinson's disease, dystonia and Huntington's disease, may also be associated with the occurrence of bruxism. Certain medical conditions, including gastro esophageal reflux disease (GERD) and epilepsy, can also be underlying causes. It has been suggested that genetic factors may play a role in the development, as bruxism often recurs in family.¹¹

Consumption of alcohol, caffeine, nicotine and recreational drugs have been implicated in the pathogenesis. Another reason may be nutrient insufficiencies and certain medications, for example, used to treat depression, seizures, and ADHD. Furthermore, having misaligned teeth or an abnormal bite can result in teeth grinding.^{6-8,10,12-13}

Clinical Manifestations and Consequences

Bruxism can lead to a range of adverse effects and complications, affecting various structures and systems in the orofacial region and beyond. Some of the common consequences include teeth wear, which may lead to pulpal exposure. Due to high masticatory forces there is increased risk of fractures in teeth and dental restorations as well as appearance of tooth sensitivity. These forces can also lead to periodontal disease and gingival recession. In addition, common symptoms are muscle pain and fatigue in the jaw area, headaches, neck and back pain. Teeth grinding can also result in temporomandibular disorders and hypertrophy of masticatory muscles. It is important to note that the severity and extent of these consequences can vary among individuals, depending on factors such as the intensity and frequency of bruxism, the presence of protective factors and the individual's overall health status.¹⁴⁻¹⁷

Diagnosis and treatment options for bruxism

The diagnosis of bruxism can be made through patient reports, clinical interviews, clinical examinations or polysomnography. Bruxism is a complex condition with a multifactorial etiology, and its management requires a comprehensive approach. Occlusal splints or oral appliances aim to protect the dentition from damage caused by clenching or grinding, although they may also reduce muscle activity. In cases where bruxism has led to significant tooth damage, dental treatments such as fillings, crowns, or other restorative procedures may be necessary to repair the affected teeth. Patients may be taught techniques to alter their resting mouth and jaw position. Massage therapy on the masticatory muscles also gives positive effects in reducing pain. Stress management strategies, such as relaxation techniques may also be recommended to address the psychological factors contributing to bruxism. In some instances, medications that target the underlying neurological or psychological factors contributing to bruxism may be prescribed, such as muscle relaxants or antidepressants.

Botulinum toxin injections into the masticatory muscles can help reduce the frequency and intensity of bruxism episodes. Reducing consumption of caffeine, alcohol, and nicotine and improving sleep hygiene may also help to reduce muscle activity. The choice of treatment approach depends on the type of bruxism (awake or sleep), the severity of the condition, the presence of associated factors, and the individual's response to the interventions. A combination of treatments is often recommended for optimal management of bruxism.¹⁸⁻³⁰

CONCLUSIONS

Bruxism is the involuntary grinding or clenching of teeth. It can occur during sleep or while awake. Bruxism has far-reaching consequences on oral health, physical well-being, and quality of life. Despite its prevalence, the etiology remains debated, with various physiological, psychological, and environmental factors implicated. Bruxism is defined as repetitive jaw-muscle activity characterized by clenching or grinding of teeth. It's classified based on timing. Etiology is multifactorial, involving physiological (CNS pathways, sleep disorders, occlusal factors), psychological (stress, anxiety, personality traits), and environmental (medications, substances, stressors) factors. Pathophysiology involves neurological pathways (dopaminergic, serotonergic, noradrenergic systems), muscular or biomechanical processes (muscle hyperactivity, occlusal forces, TMJ stress, inflammation), and sleep disturbances. Clinical Manifestations includes dental (tooth wear/fractures, damage to restorations), temporomandibular disorders (TMDs), and pain. Diagnosis of bruxism typically involves a combination of patient history, clinical examination, and, in some cases, polysomnographic studies. Treatment strategies include behavioral and lifestyle changes, oral, dental treatments for tooth damage, and, in certain instances, pharmacological interventions targeting underlying neurological or psychological factors. Bruxism is a complex condition with multifactorial etiology. Its pathophysiology involves intricate neurological, muscular, biomechanical, and sleep-related processes. Clinical manifestations impact oral health and physical well-being. Further research is needed to elucidate etiology, pathophysiology, and develop effective management strategies to mitigate bruxism's adverse effects. Continued efforts to improve diagnostic methods and develop evidence-based treatments are crucial to reduce the adverse effects of this widespread condition.

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ACKNOWLEDGEMENTS:

All authors have read and agreed with the published version of the manuscript.

Funding Statement

The study did not receive special funding.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Conflict of Interest Statement

No conflict of interest.

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