REVIEW ARTICLE

CONTENTS

# Everyday tensions: Bruxism as a reflection of 21st-century stress – narrative review of literature

**Julia Smyczek[1], Maciej Słomian[1], Katarzyna Grudnik[1], Małgorzata Grudnik[1], Mateusz Jagielski[2], Stanisław Pisarek[3], Krystian Wąs[4], Karolina Lau[5], Janusz Kasperczyk[5]**

[1]STUDENT SCIENTIFIC SOCIETY AT THE CHAIR AND DEPARTMENT OF ENVIRONMENTAL MEDICINE AND EPIDEMIOLOGY, FACULTY OF MEDICAL SCIENCES IN ZABRZE, MEDICAL UNIVERSITY OF SILESIA IN KATOWICE, KATOWICE, POLAND

[2]INDEPENDENT PUBLIC HEALTH CARE FACILITY IN SIEDLCE, SIEDLCE, POLAND

[3]NEUROLOGICAL REHABILITATION DEPARTMENT, PROVINCIAL SPECIALIST HOSPITAL NO. 5 NAMED AFTER ST. BARBARA IN SOSNOWIEC, SOSNOWIEC, POLAND

[4]REHABILITATION DEPARTMENT, J.DIETL SPECIALIST HOSPITAL IN CRACOW, CRACOW, POLAND

[5]CHAIR AND DEPARTMENT OF ENVIRONMENTAL MEDICINE AND EPIDEMIOLOGY, FACULTY OF MEDICAL SCIENCES IN ZABRZE, MEDICAL UNIVERSITY OF SILESIA IN KATOWICE, ZABRZE, POLAND

## ABSTRACT

**Aim:** This article aims to explore the complex relationship between stress and bruxism, examining how contemporary stressors contribute to the development and exacerbation of this condition. By reviewing the current literature, the aim is to provide a comprehensive understanding of the prevalence of bruxism, its relationship to stress, and the implications for health and well-being in the modern world.

**Materials and Methods:** The publication is based on research available in PubMed and Google Scholar, and a comprehensive literature search was conducted for publications from 2013 to 2024 to provide an up-to-date and comprehensive review.

**Conclusion:** By addressing the root causes of stress and promoting healthier behaviors, it is possible to mitigate the impact of this increasingly common condition, contributing to improved overall health and well-being.

**KEY WORDS:** bruxism, stress, temporomandibular joint, sleeep disorders, botulinum toxin

Wiad Lek. 2025;78(7):1403-1410. doi: 10.36740/WLek/205602 DOI

## INTRODUCTION

Initially associated primarily with teeth grinding, bruxism is now understood as a more complex parafunctional activity with significant health implications. Defined in 2018 as the repetitive clenching or grinding of the teeth and/or jaw thrusting, occurs unconsciously and is not associated with normal physiological functions such as speaking, chewing, or swallowing [1]. It can occur during sleep (dream form) or while awake (daytime form) [2].

Although it is often first detected by dentists based on signs of tooth wear, the underlying causes are multifactorial [3]. These causes include psychosocial factors such as stress, as well as pathophysiological elements such as sleep disorders, genetic predisposition, and medication use. Despite extensive research, no single cause has been identified and there is no universally effective treatment that can reduce or eliminate its occurrence.

The consequences are wide-ranging, including dental damage, muscle hypertrophy, and other symptoms such as fatigue, nervousness, and headaches [2, 4]. Usually associated with stress or tension, the condition can also act as a coping mechanism, sometimes called a "safety valve" for those struggling with chronic stress [5]. Given its complex nature, the disorder remains the subject of ongoing research in many fields of medicine [1].

Originally associated primarily with teeth grinding, bruxism is now understood to be a more complex parafunctional activity with significant health implications.

## AIM

This article aims to explore the complex relationship between stress and bruxism, examining how contemporary stressors contribute to the development and exacerbation of this condition. By reviewing the current literature, the aim is to provide a comprehensive understanding of the prevalence of bruxism, its relationship to stress, and the implications for health and well-being in the modern world.

## MATERIALS AND METHODS

The increasing prevalence of bruxism worldwide, particularly in relation to stress, is of growing concern in the 21st century. This article provides a detailed review of current research on bruxism, focusing on both sleep and wake forms, and examines how contemporary lifestyle stressors contribute to the onset and exacerbation of this condition. The publication is based on research available in PubMed and Google Scholar, and a comprehensive literature search was conducted for publications from 2013 to 2024 to provide an up-to-date and comprehensive review. The search included using specific keywords such as "prevalence of bruxism," "stress and bruxism," and "treatment of bruxism." The initial search yielded approximately 40 articles and after detailed review, 25 articles directly addressing bruxism and its relationship to stress from the years 2006 to 2023 were selected. The selection process prioritized articles that provided in-depth insights into the impact of stress on bruxism and the latest treatment strategies. The remaining 15 articles were excluded because they were either irrelevant or did not sufficiently focus on key aspects of stress and bruxism or current treatment approaches. The final selection of 25 key articles forms the basis of this review, ensuring that the conclusions drawn are both well-supported and in line with the latest scientific knowledge.

## REVIEW AND DISCUSSION

### ETIOLOGY AND CLINICAL SYMPTOMS

This article aims to explore the complex relationship between stress and bruxism, examining how contemporary stressors contribute to the development and exacerbation of this condition. By reviewing the current literature, the aim is to provide a comprehensive understanding of the prevalence of bruxism, its relationship to stress, and the implications for health and well-being in the modern world.

Bruxism is a disorder that can affect a variety of body functions, particularly leading to increased activity of the masticatory muscles and ultimately to masticatory hypertrophy. Symptoms of bruxism can include a serrated or stinging tongue, white line formation along the bite line on the cheeks, damage to dental tissues such as enamel cracks, abfractions, and excessive wear of teeth, and recurrent damage to prosthetic restorations. In addition, there may be changes in the amount and composition of saliva, severe craniofacial pain, and temporomandibular joint (TMJ) stiffness [6, 7].

Despite such a wide spectrum of symptoms, the origin of these complaints in many cases remains unclear. Most researchers agree that the direct trigger for bruxism has its origin in the central nervous system (CNS). Diseases that accompany bruxism include Parkinson's disease, anxiety, depression, obsessive-compulsive disorder, post-traumatic stress disorder, Tourette's syndrome, obstructive sleep apnea, diabetes, TMD, Sjogren's syndrome, and systemic lupus erythematosus. Temporomandibular joint disorders (TMD) associated with bruxism can be explained in the context of craniofacial anatomy [8]. Due to the fixed relationship between the maxillary teeth and the skull base and the fixed position of the mandibular teeth in relation to the temporomandibular joint, malposition of the upper and lower occlusal surfaces can directly affect the position and function of the mandibular head within the temporomandibular joint [9]. The etiology of bruxism is complex and includes local, systemic, and neurological factors. Local factors such as post-traumatic occlusion, premature contacts, overfilling, dental cysts, and abnormal eruption patterns of primary and permanent teeth can contribute to the occurrence of bruxism. Other causes include malocclusion, tartar, tooth mobility, lip deformities, gingival hyperplasia, and other occlusal problems. Systemic factors include nutritional deficiencies, parasitic infections, Down syndrome, gastrointestinal disorders, allergic reactions, uncontrolled enzymatic digestion, brain damage, drug side effects, intellectual disability, and central palsy [10]. Stress, both emotional and psychosocial, is one of the main triggers for bruxism. Increased muscle tension that occurs in response to stress can lead to increased clenching and grinding of the teeth, especially during sleep. This phenomenon is the body's response to stressors, both emotional and social. Many studies indicate a strong link between stress and the occurrence of bruxism, suggesting that people exposed to chronic stress have a higher risk of developing the disorder. Stress can lead

to increased tension in the masticatory muscles, which in the long term results in excessive wear of tooth tissue, damage to the temporomandibular joint, as well as pain symptoms in the face and head [8, 10, 16, 22].

Factors such as stress at work, emotional problems, life changes, and other psychosocial stressors can lead to an increase in bruxism symptoms, creating a kind of "vicious circle" in which bruxism becomes a reaction to stress, but at the same time its symptoms are exacerbated by the stress and emotional tension. Additionally, stress is often associated with sleep disorders, which can intensify bruxism, especially in the form of nocturnal bruxism, leading to further damage to the teeth and temporomandibular joint. Stress-induced bruxism can also cause headaches and lead to difficulties in the proper functioning of the temporomandibular joint, which is associated with disorders in the cranio-mandibular zone [6].

## BRUXISM THERAPY

Treating this condition requires a comprehensive approach that takes into account various aspects of the patient's life and habits. Modern methods of treating bruxism go beyond dental interventions and include a range of activities aimed at modifying lifestyle and implementing appropriate relaxation techniques. This holistic approach allows for effective management of bruxism symptoms, reduces the risk of its development and improves the overall quality of life of patients.

## LIFESTYLE CHANGES AND RELAXATION TECHNIQUES

The main goal is to raise awareness of parafunctional habits and their harmful effects. Recommendations for managing bruxism include regular physical activity, maintaining proper posture, avoiding chewing gum, refraining from clenching the teeth, and ensuring proper nasal breathing with proper tongue position. In addition, patients are encouraged to practice self-regulation techniques to relieve pain and fatigue.

To aid muscle relaxation and balance overactive masticatory muscles, an optimal jaw rest position is emphasized. This position involves keeping the mouth closed, with the teeth only touching during swallowing. Specific exercises are recommended to help patients achieve this, along with teaching proper tongue posture, proper nasal breathing techniques, and methods to avoid parafunctional habits.

In addition, the doctor may recommend lifestyle modifications such as quitting smoking, avoiding caffeine or alcohol in the evening, limiting physical or mental activity before bed, and providing a favorable sleep environment (quiet and dark). It is recommended to combine sleep hygiene measures with relaxation techniques. These techniques include specific methods of reducing jaw muscle tension, such as relaxing the jaw with the mouth closed and slightly open several times a day. These practices can be helpful in managing bruxism and improving overall well-being [11].

## SPLINT THERAPY

The primary goal is to raise awareness of parafunctional habits and their harmful effects. Recommendations for managing bruxism include regular physical activity, maintaining proper posture, avoiding chewing gum, refraining from clenching the teeth, and ensuring proper nasal breathing with proper tongue position. In addition, patients are encouraged to practice self-regulation techniques to relieve pain and fatigue.

To aid muscle relaxation and balance overactive masticatory muscles, an optimal jaw rest position is emphasized. This position involves keeping the mouth closed, with the teeth only touching during swallowing. Specific exercises are recommended to help patients achieve this, along with teaching proper tongue posture, proper nasal breathing techniques, and methods to avoid parafunctional habits.

Occlusal appliances are designed to stabilize the jaw, reduce occlusal interference, and relax the masticatory and neck muscles, which helps relieve strain on the temporomandibular joint (TMJ). Studies suggest that these devices can improve quality of life by balancing the forces acting on the jaw, especially during times of stress. While they can help relieve pain and reduce damage to teeth, they do not address the underlying cause of bruxism, and their effectiveness can vary from patient to patient.

One option is to use occlusive appliances. Occlusal appliances are typically worn at night, and pain relief is often noticed within a week of use. Studies show that about 50% of patients experience a reduction in muscle tension, as measured by electromyography (EMG). To ensure effective treatment, these devices are adjusted every three months to account for changes in occlusion resulting from muscle relaxation. The recommended duration of treatment is at least six months of nightly use, followed by a maintenance phase in which the device is worn one week per month for the next six months. This approach is intended to treat bruxism in the long term and reduce further damage to the masticatory system. However, nightly use can be uncomfortable for some people, and while the devices are effective in treating symptoms, they do not address the underlying causes of bruxism [12].

## BOTULINUM TOXIN

Botulinum toxin type A (BTX-A) is a neurotoxin produced by the bacteria Clostridium botulinum. It works by inhibiting the release of acetylcholine at the neuromuscular junction, which leads to muscle paralysis. When injected into the masticatory and temporal muscles, BTX-A can reduce the symptoms of bruxism by reducing muscle activity. Studies have shown that BTX-A injections can reduce bite force by 20–40% in the masticatory muscle, providing relief from the pain and discomfort associated with bruxism [13].

However, while BTX-A offers significant benefits, it is not a permanent solution. The effects typically last for 2–4 months, requiring repeat treatments. Additionally, potential side effects include dysphagia, mild pain at the injection site, and transient hypersalivation, especially when doses exceed 100 IU or in patients with other systemic diseases.

In conclusion, BTX-A represents a promising treatment option for bruxism, especially in patients who are unresponsive to traditional therapies. Its ability to reduce muscle activity and relieve associated pain makes it a valuable tool in bruxism treatment protocols. However, further studies are needed to fully understand its long-term efficacy and safety profile [11, 13, 14].

## SHORT-TERM MEDICATIONS

Pharmacological interventions for bruxism are typically used as adjuncts to severe bruxism. These include a variety of medications designed to reduce muscle tension, relieve anxiety, and manage other symptoms. Nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly prescribed for pain relief, while medications such as tolperisone (e.g., Mydocalm 50 mg, taken three times daily) help to relieve increased skeletal muscle tension. For anxiolytic and sedative effects, 25 mg of hydroxyzine is typically given one hour before bedtime. Other pharmacological options include benzodiazepines (e.g., clonazepam) to relax muscles and reduce anxiety, catecholamine precursors, beta-blockers (e.g., propranolol), alpha-agonists (e.g., clonidine), and antidepressants (e.g., amitriptyline). In addition, botulinum toxin has been shown to be effective in some cases, exerting a paralyzing effect by inhibiting the release of acetylcholine at neuromuscular junctions. Although this method has shown positive results and is considered safe, it is generally reserved for severe cases of bruxism or those refractory to conventional treatments. However, recent studies indicate that there is insufficient evidence to definitively establish the long-term efficacy of these pharmacological treatments for both sleep and wake bruxism [7, 8, 11, 14].

## BIOSTIMULATION

Electrogalvanic stimulation, a form of biostimulation, has been studied as a treatment for bruxism. By applying low-intensity electrical currents to the masticatory muscles, this method aims to reduce muscle activity. Studies show that electrical stimulation can reduce the intensity of muscle contractions in patients with nocturnal bruxism, suggesting its therapeutic potential. Conditioned electrical stimulation (CES) has also been shown to reduce the frequency of bruxism episodes when used, although the effects are temporary and last only during active periods of treatment. Despite promising results, further research is needed to assess the long-term effectiveness of electrogalvanic stimulation in treating bruxism. Although this technique is considered a complementary treatment, it is not yet widely used in clinical practice. Other biostimulation methods, such as LED photobiomodulation, have shown potential in treating fibromyalgia and may enhance the effects of other therapies, such as splints, by targeting trigger points. However, these methods remain under-researched [5-7, 15, 18].

## CORRECTION OF OCCLUSION DEFECTS

Electrogalvanic stimulation, a form of biostimulation, has been studied as a treatment for bruxism. By applying low-intensity electrical currents to the masticatory muscles, this method aims to reduce muscle activity. Studies show that electrical stimulation can reduce the intensity of muscle contractions in patients with nocturnal bruxism, suggesting its therapeutic potential. Conditioned electrical stimulation (CES) has also been shown to reduce the frequency of bruxism episodes when used, although the effects are temporary and last only during active periods of treatment.

In some cases, correcting malocclusion can significantly improve symptoms of bruxism. Integrated dental treatment, including orthodontics, prosthodontics, and restorative care, aims to address malalignment that strains the temporomandibular joint (TMJ) and masticatory muscles. Malocclusions, such as overbite or crossbite, can lead to improper occlusion, causing muscle tension and parafunctional habits such as teeth grinding [16].

Orthodontic interventions that restore occlusal harmony can reduce muscle activity and potentially reduce the number of bruxism episodes. However, while correcting malocclusion can provide relief, it may not fully address the underlying causes of bruxism, which often include psychological and physiological factors. Ultimately, the effectiveness of correcting malocclusion depends on the individual's condition and the degree of

misalignment. When combined with other treatments, orthodontic correction can help control bruxism and improve dental health [16, 17].

## COMPLICATIONS OF BRUXISM

Bruxism can cause a variety of complications, with immediate effects on dental health being particularly noticeable, including enamel erosion, tooth chipping, and cracking. These problems often require extensive corrective procedures. In addition, bruxism places significant strain on the temporomandibular joint (TMJ) and related structures, leading to pain, dysfunction, and mobility issues. These complications can impair not only oral functionality but also the patient's quality of life, requiring comprehensive diagnostic and therapeutic interventions to prevent long-term effects.

## DENTAL AND TEMPOROMANDIBULAR JOINT PROBLEMS

One of the most direct effects of bruxism is damage to the teeth and enamel. The excessive forces caused by grinding and clenching can cause significant wear, chipping, and cracking of the tooth surfaces. Over time, this leads to increased tooth sensitivity, difficulty chewing, and the need for corrective procedures such as crowns or fillings. The constant grinding also erodes the enamel, exposing the soft dentin underneath and worsening sensitivity, making the tooth more susceptible to decay. In severe cases, grinding can cause the teeth to shift, leading to misalignment and an uneven bite [10]. Bruxism is also closely associated with temporomandibular joint (TMJ) disorders, which are characterized by pain, discomfort, or dysfunction in the jaw and surrounding structures. The constant grinding and clenching of the teeth puts excessive strain on the temporomandibular joint, causing inflammation, muscle tension, and jaw pain. This can make it difficult to open or close your mouth properly, and can also cause clicking or popping sounds. In severe cases, TMJ disorders can lead to joint degeneration, affecting basic functions such as speaking and eating. These complications can seriously disrupt a person's daily activities, requiring interventions such as physical therapy, medication, and in extreme cases, surgery [17, 20-21].

## CRANIOFACIAL PAIN

Chronic pain in the craniofacial region, including the head, neck, and shoulders, is a common consequence of bruxism. The repeated activation of the masticatory muscles during teeth grinding and clenching leads to muscle fatigue, tension, and discomfort. This excessive muscle activity can affect the surrounding anatomical structures, causing widespread pain and stiffness. Patients often experience tension-type headaches and migraines, which are exacerbated by sustained pressure on the masticatory muscles. Studies have shown an association between bruxism and frequent headaches, with muscle strain playing a key role in this correlation. In addition, jaw muscle tension can radiate to the neck and shoulders, causing further stiffness and restricted mobility, which increases discomfort and limits physical activity [18]. The chronic nature of this pain has a significant impact on quality of life, affecting daily functioning, sleep quality, and mental health. If left untreated, these symptoms are likely to worsen, emphasizing the importance of early diagnosis and comprehensive treatment strategies. Effective treatment can relieve muscle tension, reduce chronic pain, and improve overall well-being [19].

## DAMAGE TO DENTURES

Bruxism can also cause damage to dental prosthetics, including crowns, bridges, and dentures. The mechanical forces of teeth grinding and clenching can cause the prosthetic material to crack or chip, weakening its functionality and integrity. This not only affects the prosthetic device itself, but can also cause additional damage to the natural teeth or surrounding gum tissue. Over time, the cumulative forces can cause the prosthetic device to become misaligned, leading to discomfort, difficulty chewing, and potential soft tissue trauma. This often requires frequent adjustments, repairs, or replacements, leading to increased clinic visits and treatment costs [20]. For patients with dental implants, bruxism can be particularly damaging. The forces generated during teeth grinding and clenching can place excessive strain on the implant, which is anchored in the jawbone. This pressure can cause the implant to loosen or lead to bone resorption, increasing the risk of implant failure. If bruxism is left untreated, the forces exerted on the implant can cause irreversible damage to the bone-implant interface, leading to implant mobility and eventual loss. In the case of full-arch or implant-supported prostheses, failure of one or more implants can undermine the overall stability of the prosthetic system, complicating treatment and requiring further invasive procedures [21].

## RELATIONSHIPS WITH HEALTH DISORDERS

Bruxism is often associated with several health disorders, one of the most common being sleep apnea,

particularly obstructive sleep apnea (OSA). OSA is characterized by frequent pauses in breathing during sleep that can trigger episodes of teeth grinding. The rhythmic clenching and grinding of teeth that occurs during sleep in response to airway obstruction disrupts sleep patterns, leading to fragmented rest and daytime fatigue. This creates a harmful feedback loop in which bruxism worsens sleep quality, while poor sleep worsens it. Treating bruxism in the context of sleep apnea often requires addressing both the airway obstruction and bruxism, usually with therapies such as CPAP devices and oral appliances [22]. Bruxism is also seen in patients with neurodegenerative diseases such as Parkinson's and Alzheimer's disease. These conditions involve involuntary motor activity, and bruxism can be a symptom of these neurological dysfunctions. In Parkinson's disease, muscle stiffness and tremor exacerbate bruxism, while in Alzheimer's disease, cognitive decline can impair control over oral habits. The co-occurrence of bruxism in these populations complicates the treatment of both the neurodegenerative disease and the associated dental damage. An interdisciplinary approach involving neurologists, dentists, and sleep specialists is often required [23]. Bruxism is also associated with gastroesophageal reflux disease (GERD). GERD is a condition characterized by the reflux of stomach acid into the esophagus, and bruxism can exacerbate GERD symptoms by increasing intra-abdominal pressure. This pressure can lead to increased acid reflux and heartburn. The co-occurrence of GERD and bruxism can worsen both conditions, requiring a comprehensive therapeutic approach to address both the mechanical aspects of bruxism and the underlying gastrointestinal issues. Proton pump inhibitors (PPIs) for GERD, along with oral dental guards, are commonly used to treat these co-occurring conditions [24].

## BRUXISM IN CHILDREN AND ADULTS: A COMPARATIVE ANALYSIS

Bruxism, or the involuntary grinding or clenching of teeth, manifests itself differently in children and adults, requiring different approaches to diagnosis and treatment. In children, bruxism is often associated with nocturnal teeth grinding and can cause symptoms such as headaches, earaches, and jaw discomfort. Although its exact cause is unclear, bruxism in children is often associated with developmental factors, stress, or misaligned teeth and tends to subside with age. However, if it is persistent, it can disrupt dental development, potentially leading to malocclusion and temporomandibular joint (TMJ) disorders [25]. In adults, bruxism is commonly associated with psychological stress, anxiety, and sleep disorders, and its symptoms include jaw pain, headaches, and teeth grinding. It can lead to significant tooth damage and is often associated with temporomandibular joint disorders. Long-term effects in adults are more pronounced, causing tooth fractures, sensitivity, and changes in bite alignment that may require dental or orthodontic treatment [9]. Therapeutic approaches differ between the two groups. In children, bruxism is often treated with observation, occlusal splints, or behavioral therapy if the condition persists. Adults typically require a multifaceted approach that includes mouthguards, stress management techniques, and treatment of underlying conditions such as sleep apnea or temporomandibular joint disorders. Understanding the differences in the impact of bruxism on children and adults is crucial to effective treatment and management [26].

## PROGNOSIS

The prognosis for the treatment of stress bruxism depends on the ability to identify and effectively manage the source of stress, as well as the applied therapy methods. Stress is one of the main causes of bruxism, and its reduction can significantly improve the patient's condition. The key factor in the treatment of stress bruxism is the active participation of the patient in the therapy, including the willingness to change lifestyle and introduce relaxation methods. The sooner the therapy is implemented, the greater the chance of preventing permanent damage to teeth and joint structures. Factors improving the prognosis include the elimination of sources of stress. Cognitive-behavioral therapy (CBT) or other forms of psychotherapy help to identify and reduce the impact of stress factors. Additional relaxation techniques such as practicing yoga, meditation or breathing exercises can significantly reduce muscle tension and teeth grinding activity. Stress bruxism has a good prognosis if the patient actively participates in the therapy, and the cause of stress is identified and reduced. A comprehensive approach combining psychological therapy, relaxation techniques and dental support produces the best results [27].

# CONCLUSIONS

The etiology and treatment of both bruxism and TMD are controversial. Most studies on psychiatric disorders associated with TMD and bruxism are cross-sectional.

No firm conclusions can be drawn about whether tics or psychiatric disorders occur after the development of TMD. However, it is clear that psychosocial factors influence the development and progression of TMD. It is clear that even after the development of TMD, the

symptoms of TMD (especially pain) influence both the development and progression of psychiatric disorders.

Therefore, when questioning the side effects of drugs, the question of bruxism should also be asked about bruxism. In the case of mild to moderate symptoms, basic protective measures should be discussed and the patient's awareness should be increased. While amitriptyline is the most important pharmacotherapy for TMD, buspirone and clonazepam are two important drugs for the treatment of bruxism. The fact that these drugs have been studied in small trials and the available information is mainly based on case reports clearly indicates the need for further research. The solution may be the widespread use of cognitive behavioral therapy for the treatment of these two disorders. Therefore, CBT should be widely used in the treatment of TMD and bruxism. Regardless of the treatment option, both dentists and psychiatrists should work in a multidisciplinary working environment and assess these conditions within a biopsy-cosocial model.

## REFERENCES


1. Lobbezoo F, Ahlberg J, Raphael KG, et al. International consensus on the assessment of bruxism: report of a work in progress. J Oral Rehabil. 2018;45(11):837–844. doi: 10.1111/joor.12663 DOI
2. Hilgenberg-Sydney P, Lorenzon L, Pimentel G, Petterle R, Bonotto D, Probable awake bruxism - prevalence and associated factors: a cross-sectional study, Dental press journal of orthodontics, 2022, 27(4), doi 10.1590/2177-6709.27.4.e2220298.oar DOI
3. Lobbezoo F, Hamburger HL, Naeije M. Etiology of bruxism. In: Paesani DA, editor. Bruxism- Theory and Practice. London: Quintessence; 2010. pp. 53–65
4. Anna S, Joanna K, Teresa S, Maria G, Aneta W, The influence of emotional state on the masticatory muscles function in the group of young healthy adults, BioMed research international, 2015, doi 10.1155/2015/174013 DOI
5. Slavicek R. The Masticatory Organ: Functions and Dysfunctions, 2nd ed.; Gamma Dental Edition: Klosterneuburg, Austria, 2006; pp. 136–138.
6. Goldstein RE, Auclair Clark W. The clinical management of awake bruxism. J Am Dent Assoc. 2017; 148(6): 387–391. doi: 10.1016/j.adaj.2017.03.005 DOI
7. Carra MC, Huynh N, Lavigne G. Sleep bruxism: a comprehensive overview for the dental clinician interested in sleep medicine. Dent Clin North Am. 2012; 56(2): 387–413, doi: 10.1016/j.cden.2012.01.003 DOI
8. Murali RV, Rangarajan P, Mounissamy A. Bruxism: conceptual discussion and review. J Pharm Bioallied Sci. 2015;7(Suppl 1):S265–S270. doi: 10.4103/0975-7406.155948 DOI
9. Mitrowska-Guźmińska M. Wpływ typu osobowości na występowanie dysfunkcji w obrębie układu stomatognatycznego. [The influence of personality type on the occurrence of dysfunctions in the stomatognathic system]. PUM, Szczecin, 2021(Doctoral thesis). (Polish)
10. Demjaha G, Kapusevska B, Pejkovska-Shahpaska B. Bruxism Unconscious Oral Habit in Everyday Life. Open access Maced J Med Sci. 2019;7(5), 876–881. doi: 10.3889/oamjms.2019.196 DOI
11. Guaita M, Högl B. Current Treatments of Bruxism. Curr Treatm Opt Neurol. 2016;18(2):10. doi: 10.1007/s11940-016-0396-3 DOI
12. Albagieh H, Alomran I, Binakresh A, et al. Occlusal splints-types and effectiveness in temporomandibular disorder management. Saudi Dent J. 2023;35(1):70–79. doi: 10.1016/j.sdentj.2022.12.013 DOI
13. Milanowska M, Dudzińska P, Grudzińska A, Jarosz D, Tsitko H. Application of botulinum toxin in the treatment of bruxism. J Edu Health Sport. 2022;12(12):291-295. eISS 2391-8306. doi: 10.12775/JEHS.2022.12.12.044 DOI
14. Macedo CR, Macedo EC, Torloni MR, Silva AB, Prado GF Pharmacotherapy for sleep bruxism. Cochrane Database Syst Rev. 2014 Oct 23;2014(10):CD005578. doi: 10.1002/14651858.CD005578.pub2 DOI
15. Aqueveque P, Pino E, López R. Electrical stimulation device as possible treatment for nocturnal bruxism: preliminary results. Annu Int Conf IEEE Eng Med Biol Soc. 2013:2013:3571-3. doi: 10.1109/EMBC.2013.6610314 DOI
16. Kataoka K, Ekuni D, Mizutani S, et al. Association Between Self-Reported Bruxism and Malocclusion in University Students: A Cross-Sectional Study. J Epidemiol. 2015;25(6):423–430. doi: 10.2188/jea.JE20140180 DOI
17. Ohlmann B, Waldecker M, Leckel M, et al. Correlations between Sleep Bruxism and Temporomandibular Disorders. J Clin Med. 2020;9(2):611. doi: 10.3390/jcm9020611 DOI
18. Gouw S, Frowein A, Braem C, et al. Coherence of jaw and neck muscle activity during sleep bruxism. J Oral Rehabil. 2020;47(4):432–440. doi: 10.1111/joor.12932 DOI
19. Elmesseh OIA, El-Sayyad MM, Karkousha RN. Correlation between bruxism and cervical function. Bull Fac Phys Ther 29:42(2024). doi: 10.1186/s43161-024-00205-7 DOI
20. Johansson A, Omar R, Carlsson GE. Bruxism and prosthetic treatment: a critical review. J Prosthodont Res. 2011;55(3):127–136. doi: 10.1016/j.jpor.2011.02.004 DOI
21. Häggman-Henrikson B, Ali D, Aljamal M, Chrcanovic BR. Bruxism and dental implants: A systematic review and meta-analysis. J Oral Rehabil. 2024;51(1):202–217. doi: 10.1111/joor.13567 DOI

22. Martynowicz H, Gac P, Brzecka A, et al. The Relationship between Sleep Bruxism and Obstructive Sleep Apnea Based on Polysomnographic Findings. J Clin Med. 2019;8(10):1653. doi: 10.3390/jcm8101653 DOI
23. Verhoeff MC, Lobbezoo F, Wetselaar P, Aarab G, Koutris M. Parkinson's disease, temporomandibular disorders and bruxism: A pilot study. J Oral Rehabil. 2018;45(11):854–863. doi: 10.1111/joor.12697 DOI
24. Li Y, Yu F, Niu L, et al. Associations among Bruxism, Gastroesophageal Reflux Disease, and Tooth Wear. J Clin Med. 2018;7(11):417. doi: 10.3390/jcm7110417 DOI
25. Bulanda S, Ilczuk-Rypuła D, Nitecka-Buchta A, et al. Sleep Bruxism in Children: Etiology, Diagnosis, and Treatment-A Literature Review. Int J Environ Res Public Health. 2021;18(18):9544. doi: 10.3390/ijerph18189544 DOI
26. Çalışkan S, Delikan E, Ozcan-Kucuk A. Knowledge of Parents about Bruxism in their Children. Odovtos. 2019;22. 187–196. 10.15517/ijds.2020.38712
27. Mayer P, Heinzer R, Lavigne G. Sleep Bruxism in Respiratory Medicine Practice. Chest. 2016 Jan;149(1):262-71. doi: 10.1378/chest.15-0822 DOI

## CONFLICT OF INTEREST

The Authors declare no conflict of interest

## CORRESPONDING AUTHOR

**Katarzyna Grudnik**
Faculty of Medical Sciences in Zabrze, Medical University of Silesia in Katowice
Student Scientific Society at the Chair and Department
of Environmental Medicine and Epidemiology,
Zabrze, Poland
e-mail: katarzyna.grudnik15@gmail.com

## ORCID AND CONTRIBUTIONSHIP

Julia Smyczek: 0009-0002-8882-7776 A B D
Maciej Słomian: 0009-0008-9060-2860 A B D
Katarzyna Grudnik: 0009-0006-1583-0041 A B D
Małgorzata Grudnik: 0009-0000-4959-8830 A B D
Mateusz Jagielski: 0009-0004-2482-7253 A B D
Stanisław Pisarek: 0009-0003-3595-1762 A B D
Krystian Wąs: 0009-0009-2423-4083 A B D
Karolina Lau: 0000-0002-8654-0301 E F
Janusz Kasperczyk: 0000-0002-6945-1200 E F

A – Work concept and design, B – Data collection and analysis, C – Responsibility for statistical analysis, D – Writing the article, E – Critical review, F – Final approval of the article

**RECEIVED:** 27.03.2025
**ACCEPTED:** 20.06.2025