Journal of Dental Sciences and Education

Review

DOI: 10.51271/JDSE-0060

Current approaches to the diagnosis and management of bruxism

Mehmet Akyüz

Department of Oral and Maxillofacial Radiology, Denizli Oral and Health Center, Denizli, Turkiye

Cite this article as: Akyüz M. Current approaches to the diagnosis and management of bruxism. *J Dent Sci Educ.* 2025;3(3):80-84.

Received: 08.06.2025 ◆ **Accepted**: 18.08.2025 ◆ **Published**: 31.08.2025

ABSTRACT

Bruxism is a repetitive motor activity characterized by involuntary movements of the masticatory muscles, such as clenching, grinding, or involuntary movements of the mandible, which may occur during sleep or wakefulness. Bruxism usually has a multifactorial etiology; dopaminergic system dysfunction, psychological stress, genetic predisposition, and environmental factors are at the forefront in this process. Self-report, clinical examination, and device-assisted methods are used in combination in the diagnostic process. In order to manage bruxism effectively, it is of great importance to first determine the underlying etiological factors; the treatment process should be customized according to individual needs and carefully planned with a multidisciplinary approach. Treatment includes occlusal splints, *Botulinum* toxin applications, physical therapy, biofeedback, laser therapy, and cognitive-behavioral interventions; in addition, psychologically based approaches such as sleep hygiene and mindfulness meditation have shown promising results. This review provides a multidimensional evaluation of bruxism from its historical definition to current classifications, etiopathogenesis, clinical-radiological findings, diagnostic approaches, and treatment options.

Keywords: Bruxism, diagnosis, treatment

DEFINITION AND CLASSIFICATION OF BRUXISM

Bruxism is a complex motor behavior characterized by involuntary activity of the masticatory muscles, which can be seen in both children and adults, and both its clinical definition and epidemiological characteristics have undergone significant changes over time. Frohman's[1] definition in 1931 is considered to be an important milestone that paved the way for the modern paradigm by demonstrating that bruxism cannot be explained solely by occlusal causes. In 1957, Nadler[2] drew attention to the psychogenic and psychosomatic aspects of bruxism; he argued that this behavior should be considered in a broader physiological and emotional context, not just a habit limited to teeth. Pavone[3] defined bruxism as one of the most common, complex, and destructive dental functional disorders in 1985; he emphasized that the diagnosis is difficult in the early stages due to the lack of valid and reliable diagnostic tools and that it can cause a wide range of negative effects such as temporomandibular disorders, tooth wear, muscle pain, and aesthetic losses. In the later period, Okeson[4] demonstrated that hard occlusal splints used in the management of nocturnal bruxism significantly decreased masticatory muscle activity, whereas soft splints could increase this activity in some individuals. In the early 2000s, Lobbezoo and Naeije[5] stated that the central nervous system plays an important role in the etiology of bruxism; factors such as smoking, alcohol, drug use, systemic diseases, and trauma were among the main factors. The definition and classification of bruxism have changed over time; in 2013, a simpler and more pragmatic definition was adopted by an international consensus. Accordingly, bruxism is defined as repetitive masticatory muscle activity characterized by clenching, grinding, and/or involuntary movements of the mandible. In line with this definition, bruxism is divided into two subtypes depending on the circadian rhythm; sleep bruxism and awake bruxism.[6] Sleep bruxism is characterized by rhythmic or non-rhythmic masticatory muscle activity that can also be observed in healthy individuals and occurs during sleep. Awake bruxism, on the other hand, is defined as a non-pathologic muscle activity that occurs with tooth contact or jaw movements during wakefulness.[7] The aim of this review is to present current literature information on the etiology, pathophysiology, prevalence, clinical and radiological findings, diagnostic methods, treatment and management of bruxism.

BRUXISM PREVALENCE

The global prevalence of bruxism is reported to be 22.22% on average in both adult and pediatric populations. The prevalence of sleep bruxism is 21%, and the prevalence of awake bruxism is 23%. In polysomnography-based measurements, the prevalence of sleep bruxism increases up to 43%. Sleep bruxism is most common in North America (31%), followed by South America (23%), Europe (21%), and Asia (19%). Awake bruxism is most commonly reported in South America (30%), followed by Asia (25%) and Europe (18%). It has been reported that bruxism is more common in women, and sleep bruxism in women shows a significant relationship with age. Since there were not enough samples in Africa and Australia, these regions were not included in the study.[8]

Corresponding Author: Mehmet Akyüz, m.aliakyz95@gmail.com

In a recent systematic review and meta-analysis study, the overall prevalence of awake bruxism in adults was found to be 15.44%; no significant difference was found according to gender, sampling method, and classification criteria.[9]

The prevalence of sleep bruxism in children is quite variable according to studies and has been reported between 3.5% and 40.6%. It was stated that the prevalence decreased with age and there was no significant difference between genders.[10]

In a study conducted in Istanbul, the self-reported prevalence of bruxism-related symptoms and their relationship with demographic variables were evaluated in 795 adult individuals. Among the participants, 45.7% reported teeth clenching and 21.6% reported tooth grinding. Women reported morning headache, difficulty opening the jaw, joint noise, and symptoms affecting daily life more frequently than men. In addition, tooth wear was observed more frequently in married individuals, while age and occupational groups showed significant differences in terms of teeth grinding, wear, and joint sounds. These findings suggest that bruxism may be related to stress-related living conditions (e.g., marital status and occupational factors).[11]

ETIOLOGY AND PATHOPHYSIOLOGY OF BRUXISM

It is generally accepted that bruxism has a multifactorial etiology that includes both peripheral (morphological) and central (pathophysiological and psychological) factors. Although occlusal discrepancies and anatomical features of the orofacial region have been cited as the main causes in the past, these morphologic factors are now considered to play only a secondary role. Recent studies have revealed that bruxism is primarily a behavior regulated by the central nervous system, particularly the dopaminergic system. In addition, smoking, alcohol, substance abuse, systemic diseases, and psychological factors are among the factors that may be effective in the development of bruxism; however, many of these relationships have not yet been finalized. When the current findings are evaluated holistically, it is thought that bruxism is a behavioral pattern predominantly originating from the central nervous system, with environmental factors contributing at a secondary level.[5]

Morphologic and functional changes occur in some neural circuits in the brain due to chronic stress; such modification leads to weakening of neural pathways that provide orofacial muscle control, increased muscle tone, decreased pain threshold, and increased involuntary muscle activity. Furthermore, the stress-activated hypothalamic-pituitary-adrenal (HPA) axis leads to elevated circulating cortisol levels; this hormonal change can be physiologically confirmed by increased salivary cortisol levels. This imbalance facilitates the development of bruxism and turns it into a self-perpetuating cyclical process.[12]

Both psychological and genetic factors have been shown to be effective in the etiology of bruxism. In clinical evaluations, anxiety has been identified as an important risk factor for bruxism. In genetic analyses, NLGN1, RIMBP2, and LHFP genes were identified as new candidate genes that may be associated with bruxism. These findings support that bruxism develops through the central nervous system and pave the way for the development of new treatment approaches in terms of understanding the disease at the molecular level.[13]

In one study, the C allele of the rs2770304 SNP was identified as a potential genetic risk factor for sleep bruxism. No significant association was found with other SNPs. Additionally, no positive association was found between genetic variants and awake bruxism or both types of bruxism. These findings suggest that genetic predisposition may be specific to sleep bruxism.[14]

In the study conducted by Rintakoski et al.[15] on twins in Finland, a significant relationship was found between sleep bruxism and genetic factors; it was reported that this effect increased with age. In addition, the genetic contribution to the phenotypic variance associated with sleep bruxism was found to be higher compared to other clinical conditions such as temporomandibular disorders.

Stress and anxiety were considered common risk factors for both sleep bruxism and awake bruxism, while depression was shown to be significantly associated only with awake bruxism. Although no direct association was found with gender, age, and nationality, it is suggested that this may indirectly increase the risk of bruxism, as women report higher levels of stress, anxiety, and depression.[16]

CLINICAL AND RADIOLOGIC FINDINGS ASSOCIATED WITH BRUXISM

The clinical symptoms of bruxism are quite diverse and cover a wide range affecting the mouth, jaw, and head-neck region. While dental pain and hot-cold sensitivity are among the frequently reported findings, chronic pain in facial muscles and tension-type headaches may develop due to intense muscle contractions. The sound caused by the teeth rubbing against each other is often not recognized by the individual but can be identified by those around them. Abnormal alignments may occur as a result of irregular wear on the teeth, and dentin may be exposed on the worn surfaces. In addition, enamel cracks, tooth fractures, and mobility may be observed. Symptoms such as stiffness in the temporomandibular joint (TMJ) region, pain, restriction in opening the mouth, and difficulty in chewing may accompany it, while ear pain is also reported in some cases.[17] Moreover, bone apposition in the jaw and hypertrophy of the masseter muscle have been reported in individuals with bruxism.[18] In a separate study, occlusal analyses performed in bruxism patients revealed that masticatory forces were not evenly distributed across the dentition.[19] Among the 50 patients evaluated, supercontacts were identified in 60%, and occlusal discrepancies were detected in 76%. Additionally, buccal mucosal hyperkeratosis was observed in 88% of the patients, with 77.3% of these lesions localized along the occlusal line. These findings suggest that bruxism may exert significant effects not only on skeletal and muscular structures but also on oral mucosal tissues.[19]

In individuals with bruxism, tooth malpositions, especially crowding, are observed more frequently. However, meta-analyses have revealed that bruxism does not show a statistically significant relationship with any type of Angle class malocclusion.[20] In the literature, it has been reported that awake bruxism is not directly associated with temporomandibular pain; however, it may lead to lower oral health-related quality of life with increased levels of anxiety and depression.[21]

On the other hand, both sleep bruxism (SB) and awake bruxism (AB) are considered to be important risk factors for

temporomandibular disorders (TMD). It has been reported that TMD subtypes such as muscle disorders and reduced disc displacement are more common in individuals with SB and AB; especially AB shows a stronger association with arthralgia. In addition, limitations in jaw functions, increased pain levels, and psychological symptoms such as depression and anxiety are more prominent in these individuals.[22]

In recent years, bruxism has been considered a motor behavior that occurs under certain conditions rather than a pathological condition. It has also been suggested that it may have a physiological or protective function in some cases. In studies with polysomnography (PSG), the relationships between sleep bruxism and clinical outcomes such as tooth wear, TMD, and dental implant failure have not been clarified. Therefore, the need for a common interdisciplinary terminology and standardized tools (e.g., STAB) in the diagnosis and evaluation of bruxism has increased. Especially restorative and prosthodontists are recommended to shape their clinical approach by taking this conceptual change into account.[23]

The literature also highlights possible links between sleep bruxism and temporomandibular joint pathologies such as myofascial pain, arthralgia, disc displacement, and joint noises.[24]

DIAGNOSTIC METHODS IN BRUXISM

According to the 2013 international consensus report, bruxism is divided into two basic subtypes. Sleep bruxism is characterized by rhythmic (phasic) or non-rhythmic (tonic) masticatory muscle activity observed in healthy individuals during sleep, while awake bruxism is defined by behaviors such as fixation or forward thrusting of the mandible with repetitive or continuous contact of the teeth during wakefulness. According to these definitions, bruxism is no longer considered a disorder in itself but as a risk factor or potentially protective behavior for some clinical conditions. Therefore, the diagnostic process should not only be based on clinical observation; it should include subjective evaluations such as self-report as well as objective measurement methods such as electromyography (EMG).[7]

The classification system proposed by Lobbezoo et al.[6] aims to define the reliability levels of methods used in the assessment of bruxism. Under this system:

- The diagnosis of "probable bruxism" is based solely on the individual's own statement.
- The diagnosis of "possible bruxism" requires both individual reporting and the presence of clinical findings.
- A "definite diagnosis" requires the use of advanced assessment tools.

Definitive sleep bruxism diagnosis requires self-report, clinical assessment, and polysomnography (PSG), preferably supported by audio or video recording, while definitive awake bruxism diagnosis requires EMG measurements with ecological momentary assessment (EMA) or experience sampling method (ESM) in addition to self-report and clinical examination.[6] This approach aims to progressively increase the accuracy of the diagnosis.

In current research, bruxism is often diagnosed as "probable" or "possible" using self-report scales or clinical observations. However, studies with a "definitive" diagnosis often involve the use of an EMG device.[25-27]

STAB (Standardized Tool for the Assessment of Bruxism), developed to evaluate bruxism more comprehensively, is the first standardized and multidimensional measurement tool in this field.[28] By addressing sleep and awake bruxism separately, STAB allows systematic evaluation of the presence, potential consequences, etiological factors, and accompanying clinical conditions of these behaviors. Combining objective tools such as self-report, clinical observation, and EMG, this system aims to perform risk analysis and relational analysis by evaluating masticatory muscle activity within a behavioral spectrum rather than making a diagnosis. In this way, STAB provides comparability and standardization in both clinical practice and scientific research.[28]

However, there is no consensus in the literature on the link between bruxism and tooth wear. Especially in studies evaluated with objective methods, this relationship has been reported to be fragile. This situation suggests that dentists should avoid making a diagnosis of bruxism based solely on the observation of wear and should not consider tooth wear alone as a determinant of bruxism.[29]

TREATMENT AND MANAGEMENT OPTIONS

It is of great importance to make the correct diagnosis in order to manage bruxism effectively. Since occlusal disorders are considered as one of the possible causes of bruxism, occlusal splints to correct these disorders are among the frequently preferred treatment options. Although there is no definite consensus on the effectiveness of splint applications, it is emphasized that this method should be used to reduce secondary damages that may occur rather than eliminating the causes of bruxism.[30]

A recent systematic review examining interventions for bruxism revealed the effectiveness levels of different treatment strategies. Accordingly, the effect of pharmacological treatments, oral rehabilitation practices, and some other interventions were generally found to be insufficient or uncertain. The results of oral appliances (e.g., night plates) varied across studies. In contrast, biofeedback, physical therapy, laser applications, and especially *Botulinum* toxin injections have shown positive effects in reducing the frequency of bruxism episodes.[31] As a matter of fact, there are data that *Botulinum* toxin applications are effective in the treatment of bruxism.[32]

Another approach that has recently appeared in the literature has been respiratory muscle training. It has been shown that inspiratory muscle training, especially in patients with obstructive sleep apnea, reduces masseter muscle contractions and awakening episodes and thus may be a potentially effective method iny the treatment of sleep bruxism.

Psychological-based interventions such as sleep hygiene practices and mindfulness-based meditation have been reported to be effective in the management of sleep bruxism in children. It was concluded that these approaches applied for five weeks reduced the incidence of sleep bruxism in children by 46% and that these methods are accessible, safe, and effective. These findings point to the potential for the use of psychologically based complementary therapies in pediatric dentistry.[34]

Methods applied within the scope of physical therapy include electrotherapy, therapeutic exercises, muscle relaxation techniques, posture awareness, manual therapy, acupuncture, and cognitive behavioral therapy. It is stated that behavioral therapy in particular is important for physical therapists to integrate psychological and physical interventions in their practice. These approaches increase the clinical effectiveness of combined interventions based on the biopsychosocial health model and have been successfully used in the management of different conditions such as low back pain, neck pain, knee osteoarthritis, musculoskeletal pain, and oncologic conditions.[35]

In general, there are various treatment approaches in the management of bruxism. Biofeedback, physiotherapy, laser applications, and *Botulinum* toxin injections have shown promise in reducing the frequency of attacks. However, there is still insufficient scientific evidence on the long-term efficacy and safety of these treatments. Therefore, treatment planning should be based on individual needs, and the process should be carefully monitored.[36]

In a study conducted in children aged 6-12 years, the effects of laser acupuncture and relaxation-oriented physical therapy interventions in the treatment of bruxism were evaluated. The results showed that both interventions reduced pain, increased mouth opening, and improved masticatory muscle activity (maximum voluntary contraction). Compared to sleep hygiene, laser and physical therapy applications stand out as more effective and promising interventions.[37]

CONCLUSION

Bruxism requires a holistic evaluation that goes beyond an approach that focuses only on dental findings in both children and adults, including behavioral, psychological and neurophysiological elements. Bruxism is a multifactorial disorder influenced by the central nervous system, environmental factors, genetic factors, and psychological factors. Treatment options include oral appliances, laser applications, *Botulinum* toxin injections; physical therapy methods such as electrotherapy, therapeutic exercises, muscle relaxation techniques, posture awareness, manual therapy, acupuncture and cognitive behavioral therapy; inspiratory muscle training in patients with obstructive sleep apnea; psychological interventions such as sleep hygiene practices and mindfulness-based meditation and biofeedback. In conclusion, the treatment strategy for bruxism should be determined based on the underlying causes and individual clinical profiles, and treatment options should be developed based on a multidisciplinary evaluation and follow-up process.

ETHICAL DECLARATIONS

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Frohman BS. The application of psychotherapy to dental problems. *Dent Cosmos*. 1931;73:1117-1122.
2. Nadler SC. Bruxism, a classification: critical review. *J Am Dent Assoc*. 1957;54(5):615-622. doi:10.14219/jada.archive.1957.0097
3. Pavone BW. Bruxism and its effect on the natural teeth. *J Prosthet Dent*. 1985;53(5):692-696. doi:10.1016/0022-3913(85)90026-5
4. Okeson JP. The effects of hard and soft occlusal splints on nocturnal bruxism. *J Am Dent Assoc*. 1987;114(6):788-791. doi:10.14219/jada.archive.1987.0165
5. Lobbezoo F, Naeije M. Bruxism is mainly regulated centrally, not peripherally. *J Oral Rehabil*. 2001;28(12):1085-1091. doi:10.1111/j.1365-2842.2006.01609.x
6. Lobbezoo F, Ahlberg J, Glaros AG, et al. Bruxism defined and graded: an international consensus. *J Oral Rehabil*. 2013;40(1):2-4. doi:10.1111/joor.12011
7. 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
8. Zieliński G, Pająk A, Wójcicki M. Global prevalence of sleep bruxism and awake bruxism in pediatric and adult populations: a systematic review and meta-analysis. *J Clin Med*. 2024;13(14):4259. doi:10.3390/jcm13144259
9. Archer AB, Da-Cas CD, Valesan LF, et al. Prevalence of awake bruxism in the adult population: a systematic review and meta-analysis. *Clin Oral Investig*. 2023;27(12):7007-7018. doi:10.1007/s00784-023-05302-w
10. Manfredini D, Restrepo C, Diaz-Serrano K, Winocur E, Lobbezoo F. Prevalence of sleep bruxism in children: a systematic review of the literature. *J Oral Rehabil*. 2013;40(8):631-642. doi:10.1111/joor.12069
11. Nekora-Azak A, Yengin E, Evlioglu G, Ceyhan A, Ocak O, Issever H. Prevalence of bruxism awareness in Istanbul, Turkey. *Cranio*. 2010;28(2):122-127. doi:10.1179/crn.2010.017
12. Pavlou IA, Spandidos DA, Zoumpourlis V, Papakosta VK. Neurobiology of bruxism: the impact of stress (review). *Biomed Rep*. 2024;20(4):59. doi:10.3892/br.2024.1747
13. Pecori A, Luppieri V, Santin A, et al. Clenching the strings of bruxism etiopathogenesis: association analyses on genetics and environmental risk factors in a deeply characterized Italian cohort. *Biomedicines*. 2024;12(2):304. doi:10.3390/biomedicines12020304
14. Campello CP, Moraes SLD, Vasconcelos BCDE, et al. Polymorphisms of the serotonin receptors genes in patients with bruxism: a systematic review. *J Appl Oral Sci*. 2022;29:e20210262. doi:10.1590/1678-7757-2021-0262
15. Rintakoski K, Hublin C, Lobbezoo F, et al. 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(6):714-719. doi:10.1017/ thg.2012.54
16. Fluerașu MI, Bocșan IC, Țig IA, Iacob SM, Popa D, Buduru S. The epidemiology of bruxism in relation to psychological factors. *Int J Environ Res Public Health*. 2022;19(2):691. doi:10.3390/ijerph19020691
17. Kanathila H, Pangi A, Poojary B, Doddamani M. Diagnosis and treatment of bruxism: concepts from past to present. *Int J Appl Dent Sci*. 2018;4(1):290-295.
18. Popescu AM, Ionescu M, Popescu SM, et al. Oral clinical and radiological signs of excessive occlusal forces in bruxism. *Diagnostics (Basel)*. 2025;15(6):702. doi:10.3390/diagnostics15060702
19. Dimova-Gabrovska MI, Maksimovskaya LN, Dimitrova DG. Changes in the oral mucosa in patients with bruxism. *Stomatologiia*. 2021;100(6. Vyp. 2):48-52. doi:10.17116/stomat202110006248
20. Ribeiro-Lages MB, Martins ML, Magno MB, et al. Is there association between dental malocclusion and bruxism? A systematic review and meta-analysis. *J Oral Rehabil*. 2020;47(10):1304-1318. doi:10.1111/joor.12971
21. Machado NAG, Costa YM, Quevedo HM, et al. The association of self-reported awake bruxism with anxiety, depression, pain threshold at pressure, pain vigilance, and quality of life in patients undergoing orthodontic treatment. *J Appl Oral Sci*. 2020;28:e20190407. doi:10.1590/1678-2019-0407

22. Cigdem Karacay B, Sahbaz T. Investigation of the relationship between probable sleep bruxism, awake bruxism and temporomandibular disorders using the diagnostic criteria for temporomandibular disorders (DC/TMD). *Dent Med Probl.* 2023;60(4):601-608. doi:10.17219/dmp/158926
23. Manfredini D, Ahlberg J, Lobbezoo F. Bruxism definition: past, present, and future-what should a prosthodontist know? *J Prosthet Dent.* 2022;128(5):905-912. doi:10.1016/j.prosdent.2021.01.026
24. Jiménez-Silva A, Peña-Durán C, Tobar-Reyes J, Frugone-Zambra R. Sleep and awake bruxism in adults and its relationship with temporomandibular disorders: a systematic review from 2003 to 2014. *Acta Odontol Scand.* 2017;75(1):36-58. doi:10.1080/00016357.2016.1247465
25. Önsüren AS, Temur KT. Evaluation of fractal analysis and radiomorphometric measurements of mandibular bone structure in bruxism and non-bruxism paediatric patients. *Oral Radiol.* 2025;41(1):60-68. doi:10.1007/s11282-024-00776-0
26. Botelho J, Machado V, Proença L, et al. Relationship between self-reported bruxism and periodontal status: findings from a cross-sectional study. *J Periodontol.* 2020;91(8):1049-1056. doi:10.1002/JPER.19-0364
27. Kolcakoglu K, Amuk M, Sirin SG. Evaluation of mandibular trabecular bone by fractal analysis on panoramic radiograph in paediatric patients with sleep bruxism. *Int J Paediatr Dent.* 2022;32(6):776-778. doi:10.1111/ipd.12956
28. Manfredini D, Ahlberg J, Aarab G, et al. Standardised tool for the assessment of bruxism. *J Oral Rehabil.* 2024;51(1):29-58. doi:10.1111/joor.13411
29. Bronkhorst H, Kalaykova S, Huysmans MC, Loomans B, Pereira-Cenci T. Tooth wear and bruxism: a scoping review. *J Dent.* 2024;145:104983. doi:10.1016/j.jdent.2024.104983
30. Reddy SV, Kumar MP, Sravanthi D, Mohsin AH, Anuhya V. Bruxism: a literature review. *J Int Oral Health.* 2014;6(6):105-109.
31. Soares-Silva L, de Amorim CS, Magno MB, Tavares-Silva C, Maia LC. Effects of different interventions on bruxism: an overview of systematic reviews. *Sleep Breath.* 2024;28(3):1465-1476. doi:10.1007/s11325-023-02961-7
32. Pabst A, Kämmerer PW, Heimes D, Zeller AN, Quarta M. *Botulinum* toxin for bruxism treatment: a nationwide study among oral and maxillofacial surgeons in Germany. *Clin Oral Investig.* 2024;28(9):501. doi:10.1007/s00784-024-05898-7
33. Cavalcante-Leao BL, Porporatti AL, Cíntia Felicio Adriano R, et al. Effects of respiratory exercises in sleep bruxism and associated obstructive sleep apnea: a double-blind, placebo-controlled randomized clinical trial. *Acta Odontol Scand.* 2024;83:120-125. doi:10.2340/aos.v83.40252
34. Amaral CC, Fernandez MDS, Chisini LA, Boscato N, Jansen K, Goettems ML. Sleep hygiene measures combined with mindfulness meditation in the management of sleep bruxism in children: a randomized controlled clinical trial. *Int J Paediatr Dent.* 2025;35(1):118-128. doi:10.1111/ipd.13212
35. Nielsen M, Keefe FJ, Bennell K, Jull GA. Physical therapist-delivered cognitive-behavioral therapy: a qualitative study of physical therapists' perceptions and experiences. *Phys Ther.* 2014;94(2):197-209. doi:10.2522/ptj.20130047
36. Soares-Silva L, de Amorim CS, Magno MB, Tavares-Silva C, Maia LC. Effects of different interventions on bruxism: an overview of systematic reviews. *Sleep Breath.* 2024;28(3):1465-1476. doi:10.1007/s11325-023-02961-7
37. Rashed MF, Mohamed MA, Mohamed NER, Mansy ME. Evaluation of laser acupuncture versus physical therapy intervention in management of bruxism in children: a randomized controlled trial. *BMC Oral Health.* 2025;25(1):341. doi:10.1186/s12903-025-05626-x