

Sleep Bruxism and Stress

Andreea M Musat

World Journal of Dentistry (2023): 10.5005/jp-journals-10015-2316

Sleep bruxism, characterized by involuntary teeth grinding or clenching during sleep, has long been a subject of interest in dental and sleep medicine.^{1,2} Drawing upon recent research, neurobiological insights, and clinical studies, this letter to the editor explores the bidirectional nature of this association, shedding light on the mechanisms through which stress influences sleep bruxism and vice versa. Understanding this complex interplay has important implications for managing and treating both conditions, ultimately enhancing the quality of life for affected individuals.

Sleep bruxism, a parafunctional activity involving the rhythmic clenching or grinding of teeth during sleep, affects a significant portion of the population.^{3,4} Although the exact etiology of this phenomenon remains elusive, growing evidence suggests a strong relationship between sleep bruxism and stress. Stress, a multifaceted psychological and physiological response to challenging situations, has been linked to various health issues, including sleep disturbances.⁵⁻⁷ The connection between sleep bruxism and stress is intricate, and the discoveries of the potential mechanisms are essential for clinical practice.

Recent advances in neuroscience have illuminated the complex interaction between stress and sleep-related disorders.⁸ Stress activates the hypothalamic–pituitary–adrenal axis, releasing cortisol, and other stress hormones. These hormones can disrupt the sleep-wake cycle and impact sleep architecture. Additionally, stress can modulate the autonomic nervous system, leading to increased sympathetic activity, which may contribute to sleep bruxism episodes. Conversely, sleep disturbances resulting from sleep bruxism can create a cycle of stress and impaired sleep quality.⁹⁻¹¹

The relationship between sleep bruxism and stress appears to be bidirectional. On the contrary, stress can serve as a trigger for sleep bruxism episodes. Individuals undergoing acute or chronic stress may be more prone to engaging in parafunctional behaviors during sleep, including teeth grinding and clenching.¹²⁻¹⁴ On the contrary, the sleep disruptions caused by sleep bruxism can lead to increased stress levels. Sleep deprivation from frequent arousals during bruxism episodes can contribute to irritability, cognitive impairment, and worsening stress-related symptoms.

Several mechanisms may underlie the influence of stress on sleep bruxism and vice versa. Shared neurobiological pathways, including the involvement of neurotransmitters such as serotonin and dopamine, could contribute to the manifestation of both conditions. Psychophysiological responses to stress, such as muscle tension and autonomic arousal, might trigger sleep bruxism in vulnerable individuals. Conversely, sleep bruxism-related pain and discomfort could increase stress levels.

Understanding the intricate relationship between sleep bruxism and stress has significant clinical implications. Addressing

Private practice in Rome, Rome, Italy

Corresponding Author: Andreea M Musat, Private practice in Rome, Rome, Italy, Phone: +39 389 119 3451, e-mail: andreamaria.musat@outlook.it

How to cite this article: Musat AM. Sleep Bruxism and Stress. *World J Dent* 2023;14(10):829–830.

Source of support: Nil

Conflict of interest: None

stress management strategies alongside traditional treatments, such as occlusal splints and behavioral interventions, could enhance treatment outcomes for individuals presenting with sleep bruxism. Moreover, clinicians treating stress-related disorders should be aware of the potential impact of sleep bruxism on overall well-being and consider incorporating sleep assessments into their diagnostic protocols.^{15,16}

The existing body of literature underscores the bidirectional relationship between sleep bruxism and stress, revealing the intricate mechanisms through which these conditions influence each other. This editorial highlights the importance of considering psychological and physiological factors when addressing sleep bruxism and stress in clinical practice. Further research is warranted to elucidate the precise pathways linking these phenomena, enabling the development of more targeted and effective interventions for affected individuals.

As research in sleep medicine and stress continues to evolve, several avenues of exploration hold promise for enhancing our understanding of the relationship between sleep bruxism and stress.¹⁷

Advanced neuroimaging techniques, such as functional magnetic resonance imaging and positron emission tomography, can provide insights into the neural substrates involved in the interaction between stress and sleep bruxism. Mapping the brain regions and circuits implicated in both conditions could uncover novel therapeutic targets.

Longitudinal studies tracking individuals over extended periods can help elucidate the temporal relationship between stress and sleep bruxism. By observing how changes in stress levels correspond to fluctuations in sleep bruxism frequency and severity, researchers can establish causal links and identify critical periods of vulnerability.

Exploring potential biomarkers associated with sleep bruxism and stress could facilitate early detection and personalized interventions. Identifying specific biomarkers related to stress-induced hyperarousal or sleep bruxism-related muscle activity could aid in predicting and preventing exacerbations of both conditions.¹⁸

Developing innovative intervention strategies that target both sleep bruxism and stress holds promise for improving patient

outcomes. Cognitive-behavioral therapies, mindfulness-based stress reduction, and pharmacological interventions targeting stress-related pathways could be investigated for their efficacy in managing both conditions simultaneously.

Increasing awareness among patients regarding the bidirectional relationship between sleep bruxism and stress can empower individuals to take proactive measures to mitigate their symptoms. Education about stress reduction techniques, relaxation exercises, and sleep hygiene practices could complement traditional treatment approaches.^{14,19–22}

When addressing the relationship between sleep bruxism and stress, it is essential to consider the ethical implications. Researchers and healthcare providers should prioritize patient autonomy and well-being. Informed consent processes should encompass potential impacts on mental health and quality of life, particularly when discussing stress-related interventions that may have broader implications beyond the scope of dental and sleep medicine.^{23,24}

The intricate interplay between sleep bruxism and stress presents a fascinating area of research with important clinical implications. As understanding the neurobiological, psychophysiological, and behavioral links between these phenomena deepens, healthcare professionals can adopt more holistic approaches to diagnosis and treatment. By recognizing the bidirectional nature of the relationship and addressing both sleep bruxism and stress comprehensively, clinicians have the potential to improve the overall well-being of affected individuals and contribute to the advancement of both dental and sleep medicine.

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