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# Diagnosed Night Bruxism – Prevalence And Therapy

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## ABSTRACT

**Introduction:** Bruxism is an oral parafunctional habit in which a process of clenching, grinding and gnashing of the teeth occurs, which manifests itself on an unconscious level in patients during sleep. After analyzing day and night bruxism, it was found that night bruxism has a high prevalence. It increases and is associated with several factors such as stress, medications, anxiety, changes in lifestyle and diet, as well as sleep disorders. Therefore, the therapist should be familiar with the etiological causes, in order to provide the most optimal plan for prevention and therapy of the patient through modern diagnostic protocols and therapeutic modalities.

**Purpose:** Analyzing the literature data the goal was set to present the diagnosed night bruxism with its prevalence and therapy with the manufacture of occlusal splints.

**Material and methods:** The Internet databases that helped create this review paper were Pubmed, Scopus, ScienceDirect, Researchgate, Academia, application of written textbooks from the country as well as from abroad. The literature search was assisted by keywords in the field of night bruxism.

**Results and Discussion:** The prevalence of diagnosed night bruxism is very high, and the therapy is aimed at eliminating the problems deriving from night bruxism. It is of great importance that after the therapy with occlusal splints, prevention of the entire stomatognathic system is also performed. Therefore, the therapist is directed towards early prevention, which includes the production of paraclinical devices for monitoring the type of bruxism and its' patterns. To prevent the consequences of night bruxism, which include abrasion, tooth fractures, fracture of prosthetic restorations, damage to dental implants, headache, periodontal lesions and temporomandibular dysfunctions, appropriate therapeutic modalities should be used. Individually designed occlusal splints worn regularly at night help in the prevention and treatment of night bruxism, which protects against further damage to the stomatognathic system. Kapusevska, in her studies, emphasizes the need for early diagnosis for the timely removal of etiological factors that affect the occurrence, course and manifestations of night bruxism. In this way, therapists are encouraged to manufacture appropriate splints that will act preventively on the tissues of the stomatognathic system.

**Conclusion:** Night bruxism, more accurate after the Covid -19 pandemic, completely changes the normal physiological course of the stomatognathic system. Everything should be done to educate dental and medical personnel for timely detection, prevention and treatment of the stomatognathic system of patients from the consequences of diagnosed night bruxism.

**Keywords:** diagnosed night bruxism, prevalence, prevention, therapy, education, splints.

## DIAGNOSED NIGHT BRUXISM – PREVALENCE AND THERAPY

## INTRODUCTION

Bruxism is an oral parafunctional habit in which a process of clenching, grinding and gnashing of the teeth occurs, which manifests itself on an unconscious level in patients during sleep. After analyzing day and night bruxism, it was found that night bruxism has a high prevalence. Patients themselves are often not even aware that they have a problem that affects not only their stomatognathic system, but also their overall health. According to Lavigne et al. the clenching and grinding of the teeth are activities of the stomatognathic system that therapists should be familiar with, so that they can timely prevent the structures of the stomatognathic system from tooth fractures and (or) prosthetic restorations, as well as the occurrence of temporomandibular dysfunctions (TMD)[(1)].

Most often, when patients come for an examination in the office, they are not informed that they have problems that have visibly taken place on the teeth, masticatory muscles and temporomandibular joint (TMJ), even though they are asymptomatic. All these changes lead the therapist to suspect that these patients have parafunctional habits, most often some type of bruxism. Dentists should be familiar with this habit in order to refer patients for proper diagnosis and



treatment of this condition. Sometimes patients have a different non-specific symptomatology such as tinnitus, which is

why they visit otolaryngologists who also need to be trained to diagnose night bruxism. On the other hand, patients with symptomatology that also affects the nerve pathways, with headaches, neck pain, shoulder pain and other symptoms, are referred to neurology specialists, believing that they will find the answer to their problems there[1].

Kapusevska explains that night bruxism, also known as sleep bruxism, is an unconscious oral parafunctional habit of rhythmic non-functional pressing, squeezing, clenching, gnashing with the teeth while performing movements during sleep and therefore patients are often unaware of their condition. In order to make an appropriate early diagnosis, therapists should be familiar with all therapeutic modalities. Since night bruxism occurs during sleep, patients are referred for polysomnography in specialized institutions, and the results are read in the morning by a team of specialists. Today, there are also many reduced digital devices that adhere to the skin in the buccal region and record the activity of the masticatory muscles, in a way that simplifies diagnosis, reduces the need for patients to make multiple visits, and thus reduces the stress they experience[2].

The condition when night grinding occurs in combination with at least one of the following signs as tooth damage, sounds associated with bruxism, and pain in the masticatory muscles, is defined by the International Classification of Sleep Disorders as night bruxism[3].

Worldwide research shows a high prevalence of bruxism at every age. The most recent data from a meta-analysis conducted in 2024 indicate a global prevalence of bruxism (day and night) of 22.22%[3].

Bader describes that night bruxism can occur in infancy and childhood. Since teeth have a genetically predetermined period of eruption, teeth that are higher up cause premature contact and clenching habits in children. For a certain period of childhood, this habit of clenching, gnashing and grinding of the teeth can be considered normal. As the child grows older, night bruxism can continue throughout life, into adolescence and even adulthood[4].

The International Classification of Sleep Disorders indicates that 85–90% of the general population will experience night bruxism at some point in their lives, while only 5% will develop a clinical picture[5].

Studies by Shetty et al., as well as Macedo et al., indicate that daytime bruxism affects more female patients, while night bruxism affects both sexes equally[6.7].

Night bruxism has always represented a challenge for therapists to find the most appropriate therapeutic modality for preventing the stomatognathic system from the consequences of night bruxism. At the same time, when treating patients diagnosed with night bruxism, therapists should find a method to make prosthetic devices last longer in these patients[2].

## PURPOSE

By analyzing the literature data, the goal was set to present diagnosed night bruxism with its prevalence and therapy by making occlusal splints.

## MATERIAL AND METHODS

In order to assess the prevalence and treatment of diagnosed night bruxism, studies were conducted on electronically available data on internet databases such as Pubmed, Scopus, Science Direct, Researchgate, and Academia. and others. Contemporary textbooks from domestic and foreign literature were also used. The literature search was assisted by keywords in the field of night bruxism. A total of 143 papers were searched and analyzed, of which special attention was paid to papers from more recent dates that elaborate the contemporary multidisciplinary approach of night bruxism.

## RESULTS AND DISCUSSION

In everyday clinical practice, supported by literature data, we are witnessing an increased occurrence of patients with night bruxism. This is of particular interest after the Covid-19 pandemic, where a higher prevalence of night bruxism was observed among patients visiting the dentist, noted by an increased number of fractures of natural teeth, prosthetically treated teeth, as well as prosthetic devices such as removable dentures. The global prevalence on night bruxism from literature data from 2024 is 21%, while prevalence on day bruxism is 23%. The occurrence on night bruxism based on polysomnography, was estimated at 43%. The highest prevalence of night bruxism was noticed in North America with 31%, then in South America with 23%, in Europe with 21% and Asia with 19%. The prevalence of day bruxism was highest in South America with 30%, after what follow Asia with 25% and Europe with 18%. The study of Zieliński also concluded that, bruxism equally affects men and women, and it rarely affects the elderly people[3].

From the literature research, findings were obtained that will help dentists, dental technicians and patients. Dentists and doctors from different specialties who deal with the problem of night bruxism should be familiar with its complications, then they should be able to recognize it and inform the patient about his condition. The therapists must raise public awareness about the importance of prevention. Next, the role of the therapist is to educate and enable the patient to help himself[2].

Attanasio reports that due to abnormal tooth wear caused by clenching and grinding, especially during the night, when the chewing forces calculated in N (Newtons) are very high, the teeth experience varying degrees of damage to the dental tissues. Thus, night bruxism can contribute to the occurrence of mild, moderate and severe consequences on the tissues of the stomatognathic system. Depending on the consequences of night bruxism, varying degrees of symptoms occur.

Symptoms that are most often associated with the occurrence of night bruxism include pain in the masticatory muscles, headaches, hypersensitivity of teeth, as well as damage to teeth and prosthetic restorations, and these are most often discovered by patients in the morning, which is why they most often come for an examination in dental offices[8].

Tyldesley et al., regarding the occurrence, course, manifestations, and consequences of night bruxism mention a multifactorial etiology where multiple causes act together in synergy, and for some of them, science, medicine, and dentistry are still searching for appropriate answers[9].

Yap AU et al., as well as Cawson et al. in their works indicate occlusal and articulation discrepancies of the maxilla and mandible which are considered to be directly involved for the occurrence of nocturnal bruxism, which originates from the intrauterine development of the fetus[10.11].

Carlsson et al., as well as Manfredini et al. cite the orthodontic class of Angle - II/2 which, in addition to other orthodontic anomalies, as a direct cause of the appearance, course and development of bruxism. This is of importance for dentists specializing in dental prosthetics as well as orthodontics who should work together to prevent the consequences of night bruxism[12.13].

Cadar talks about relevance on occlusal changes and in the appearance on the night parafunction bruxism, which in the moment is a source on many debates. In clinical meaning, the interval on confidentiality, had shown that more cases for support on the correlation between occlusal interferences and the occurrence of nocturnal bruxism are necessary. The results from statistical analysis for the connection on night bruxism with existence on other parafunctional habits were not significant[14].

Kapusevska points out the importance of the phenotype, genotype, and psychotype of patients as being directly responsible for the occurrence of night bruxism. Genetics plays a huge role in the inheritance of night bruxism. Analysis of the genetic manifestation of night bruxism is observed in multiple individuals within a family. Next, the way patients behave in their daily lives and the influence they are exposed to from the environment affects them on a conscious level and then in a state of sleep they subconsciously manifest a state of parafunction through clenching, grinding and gnashing on their teeth. Each person experiences things differently psychologically, and reacts differently and it has been scientifically proven that one of the ways to deal with stress is through night bruxism[15].

Okeson emphasizes the importance of external factors that contribute to the manifestations of night bruxism. Smoking, caffeine intake, medications and illicit drugs act on the central nervous system and can contribute to the disruption of the symptomatology of night bruxism. On the other hand, dentists should be in contact with their colleagues specialists in otorhinolaryngology because sleep disorders such as sleep apnea and snoring are often present in the etiology of night bruxism[15.16].

Lobbezoo et al. observe that just as there is no single factor responsible for the occurrence of night bruxism, there is no single treatment that is effective in eliminating it or reducing it[17].

Tyldesley divides the night bruxism into moderate, severe, and extreme according to the degree of severity of its occurrence, i.e. the consequences it leaves on the stomatognathic system[9].

Süreyya et al. indicate that individuals with severe night bruxism present greater intensity of muscle pain, sleep disturbance, poor oral health, and high levels of anxiety shown with high statistical significance[18].

Murali et al. describe the existence of several different forms of night bruxism. Thus, in eccentric bruxism there are isotonic muscle contractions and damage to the incisal edges of the teeth, especially in the anterior dental arch[19].

Okeson speaks of the power of the subconsciousness where, due to the absence of neuromuscular protective mechanisms, injuries can be caused due to overload of the masticatory system and the occurrence of temporomandibular dysfunctions that affect the entire stomatognathic system, and thus affect overall human health[8].

Depending on the 24-hour period when bruxism occurs, Takeuchi T. et al. divide bruxism into day, night or combined[20].

For the occurrence of night bruxism, authors speak of the presence of increased heart rate, respiratory changes, and generally increased muscle activity. The forces that occur in patients with diagnosed night bruxism, the literature says, can be up to three times greater than normal. They can be expressed to such an extent as to cause fractures of a solidly made fixed-prosthetic construction, as well as fractures of complex fixed-mobile prosthetic reconstructions, which patients notice after waking up from sleep. Lavigne points out that therapists who manufacture prosthetic restorations in patients with already diagnosed parafunctional habits such as night bruxism should be very careful in choosing materials for prosthetic treatment[1].

However, if measures are not taken to prevent existing night bruxism, serious complications may occur, such as fracture of the prosthetic devices, loss of suprastructures over dental implants, fracture of the implants themselves, damage to the peri-implant tissue, supporting bone, and remaining dentition. In such patients, Lavigne et al., Kapusevska, and Macedo et al. came to the same results from their research, which is the need for mandatory first aid and therapy where occlusal splints are made[1.5.7].

From the perspective of analyzing the multifactorial nature of the occurrence of night bruxism, the mental health of patients should be analyzed, as seen in the studies of Kato et al. Sutin et al, Tsai et al. Hence, it follows that a team of specialists is necessary who will directly act to improve the psycho-physical health of the individual. Patients who have been diagnosed with night bruxism are relatively ambitious, capable patients who are in a constant race against time to realize their goals, but they can also manifest other mental characteristics that need to be positively affected. Hence, the need for the involvement of cognitive-behavioral therapy as part of the treatment protocol for patients with diagnosed night bruxism[21-28].

Ohayon M. et al. have come to the conclusion that systemic factors related to nutritional insufficiency, the influence of various drugs, are the causes of the occurrence of night bruxism. Also, certain syndromes accompanied by mental insufficiency are considered to have a greater predisposition to the occurrence and manifestation of parafunctional activity. Patients with cerebral palsy have been proven to have a greater predisposition to the occurrence of night bruxism[29].

The topic for mentally health is especially actualized after the Covid-19 pandemic where because of long-lasting stress, as well as isolation on patients, increased occurrence on mental problems developed, and some of them are associated with the appearance of night bruxism. Patients in everyday clinical practice more often come in the dental office with fractured teeth, weakened supportive apparatus, damaged fixed bridge constructions, as well as fractured removable prosthetic restorations[3].

Kapusevska explains that local factors such as consumption of beverages: coffee, tea, chocolate drinks, soft drinks, as well as smoking habits stimulate the central nervous system, thereby negatively affecting sleep, making them initial factors causing the occurrence of nocturnal bruxism[30].

According to Tyldesley, a pathological condition will be accurately treated if the etiological causes are discovered in a timely manner, among which psychological and genetic factors dominate[9].

According to Kapusevska, for objective diagnosis of all types of bruxism, including night bruxism, a bruxchecker can be used to determine whether it is horizontal or vertical[31]. In addition to the bruxchecker, there is the possibility of using a bruxquantifier, a device that measures the amount of damaged tooth substance. Depending on the grinding patterns, subjectively and objectively proven with the bruxchecker, groups of teeth are formed that have abnormal wear, analyzed with the bruxchecker, which is objective evidence for the occurrence of a horizontal form of night bruxism. If there are dentin fractures that can also affect the pulp of the tooth, toothaches of pulpal origin will occur, and occlusal traumatism inevitably leads to disruption of the supporting apparatus. The disruption of the periodontium can lead to the introduction of infection, which causes processes such as retrograde involvement of the pulp tissue, which leads to inflammation of the pulp and the need for urgent treatment. Tooth wear can be limited to one tooth and its structures or to the entire dentition. To determine the volumetric wear of the teeth and changes in occlusal interference, the bruxoquantifier is used, with the analysis of which we observe the appearance of a vertical form of night bruxism.

Wahlund et al. developed occlusal splints for the treatment of patients diagnosed with night bruxism. In their studies, they found that they were effective in preventing tissue damage to the stomatognathic system in patients diagnosed with night bruxism[31.32].

Tyldesley et al. recognize the importance of paraclinical examinations in addition to the diagnosis of night bruxism. Radiographic analyses must be applied as an adjunct to a solid diagnosis, in order to guide therapists in which direction to act with prosthetic protocols. Given the fact that today there are different techniques, digital technologies have facilitated the use of a digital apparatus for radiographic 2D images that can be read precisely on a computer screen. Even more importantly, today the possibility of 3D diagnostics with computed tomography allows us to perceive significant differences in craniofacial morphology, especially in the mandibular structure, in patients diagnosed with night bruxism, compared to patients who are not bruxers. This will allow for a more accurate assessment of lamina loss, changes in the periodontal space, as a consequence of complications of bruxism, which, if not controlled, can lead to tooth luxation, tooth root resorption, or tooth fracture[9].

Machado et al. indicate that in addition to changes in dental tissues, night bruxism with all its pathological mechanisms causes changes in the masticatory muscles, and their activity is increased, which is objectively observed on electromyography. Changes also occur in the temporomandibular joint (TMJ). These changes can in turn lead to the appearance of headaches, behavioral and psychological effects. Muscular symptoms include fatigue, as well as increased tension in the masticatory muscles, especially in the elevatory muscles (m. masseter and m. temporalis)[7.33].

Kato explains that bruxism can cause problems with body movement, and the affection is observed in the masticatory muscles and the posterior muscles of the cervical spine, and this is the reason that causes the muscle pain and future chronic permanent changes. Today, therapists do not see bruxism as a local, but as a systemic phenomenon. Therefore, when treating patients with bruxism, not only the stomatognathic system is treated, but also the analysis of the head, neck, spine region is moved to, that is, the postural position of the patients' body is also treated[13].

Badel et al., Kawakami et al., as well as Alóe et al. in their articles came to the conclusion that in patients with long-term occurrence of night bruxism, changes in the TMJ are diagnosed, more precisely in the capitulum mandubulae. The wear of the teeth and changes in the TMJ lead to a subsequent loss of the vertical dimension, which patients suddenly notice

aesthetically as the appearance of a prematurely aging appearance and a prematurely aged face, i.e. pronounced sulcus nasolabialis and mentolabilias . It should be emphasized that due to the altered anatomy of the teeth as well as the altered physiology of the TMJ, there is a pronounced mandibular displacement in the maximum intercuspidal position[34.35.36].

Singh and Berry state that the beginning of therapy involves reducing psychological stress through the use of relaxation methods such as exercises, massages and physiotherapy, which reduces symptoms, but does not eliminate the cause. These authors found that the use of soft occlusal splints in patients with diagnosed night bruxism resulted in minimal improvement of the stomatognathic system, which is why they advise the use of other therapeutic modalities[37].

Adibi et al. point out the positive aspects of using occlusal splints, as they allow the condyle to be positioned correctly in the fossa mandibularis[38].

Van der Zag et al. explain that occlusal splints can be made of different materials, different shapes, different hardness, resilience, extension of occlusal coverage as well as with different design techniques. Today there are a huge number of ways to make occlusal splints, both conventionally with factory foils, and individually with special materials that therapists together with dental technicians can adapt according to the indications in patients with diagnosed night bruxism[39].

The division of occlusal splints can also be based on the care required for the rehabilitation of horizontal and vertical forms of bruxism. For the treatment of patients with horizontal bruxism and temporomandibular dysfunction, Kapusevska et al. recommend the use of repositioning occlusal splints, while in patients with vertical bruxism and musculofacial pain, stabilizing occlusal splints are used. The author in her studies found that the usage of repositioning as well as stabilizing occlusal splints after a precisely predetermined indication, allows for maximum improvement in the treatment of patients with diagnosed night bruxism[40].

Authors indicate that regardless of the etiological causes of night bruxism, occlusal therapy with the help of occlusal splints prevents further damage to the components of the masticatory system. Supplements such as magnesium, vitamins and nonsteroidal anti-inflammatory drugs are prescribed as additional treatment. The use of pharmacological therapy is a complement to the therapy with occlusal splints. Balanta Melo et al. also recommend the use of botulinum toxins in the masseter muscles in severe forms of nocturnal bruxism[5.23.24.25].

The most commonly used occlusal therapy using occlusal splints made of hard acrylic material, along with other pharmacological and psychological therapies, is today recommended as a method that leads to the prevention of injuries to the structures of the stomatognathic system[41].

Macedo et al. found that there are not enough evidence to prove that the occlusal splint is effective for treatment of night bruxism. Indication for its' usage is questionable in relationship on the outcome from sleep, but can benefit in prevention of damage to dental tissues. According to them, the occlusal splint has a moderate improvement of the stomatognathic system when used in patients with night bruxism. In the future, studies with a larger number of subjects and a longer duration of the study are recommended so that we can draw conclusions about improving the therapeutic protocol that would be effective in terms of prevention and therapy of the group of subjects[42].

On the other hand, Rabel et al. produce a digitally designed occlusal splint with excellent occlusal fit, which in a patient after 6 months of treatment in a state of diagnosed night bruxism provides solid prevention from further damage to the stomatognathic system. This achieves maximum improvement of the stomatognathic system of patients as well as of the entire human organism. Digital systems in prosthetics facilitate the process of impression taking as well as the production of occlusal splints. So even if there is a loss or breaking on the occlusal splint at patients with diagnosed night bruxism, identical occlusal splint can be manufactured, if the optical impression data is properly stored in the digital files, with time saving both on the dentist and on the patient[43].

Analyzing the results of the applied therapy with the use of occlusal devices and occlusal splints by different authors, and chronologically analyzed in different time periods, a sublimation of the degree of improvement of the stomatognathic system can be given (Table 1).

*Table 1. Assessment of the degree of improvement of the stomatognathic system from the usage of occlusal splints*

| Authors | Year | Type of treatment | Improvement |
|---|---|---|---|
| Singh [37] | 1985 | Soft occlusal splints | Minimum improvement |
| Macedo [42] | 2007 | Occlusal splints | Medium improvement |
| Kapusevska [15] | 2014 | Occlusal splints from eclipse | Maximum improvement |

| | | | |
|---|---|---|---|
| Wahlund [32] | 2015 | Occlusal devices | Good improvement |
| Rabel [43] | 2024 | Digitally designed occlusal splints | Maximum improvement |

Over the years, the most appropriate solutions have been sought to help patients diagnosed with night bruxism. There is a division in the opinions of authors as to which material for making occlusal splints is the most appropriate, although the greatest agreement is that the material chosen should be designed individually for each patient. Next, attention must be paid to the fact that the forces that develop in the mouth are so high that materials resistant to the stress forces that act during sleep in a state of night bruxism should be used. Therefore, most of the authors who make individually designed occlusal splints decide for materials that, with their hardness, will resist the high forces caused by night bruxism during sleep.

No less important is additional therapy such as pharmacotherapy with nonsteroidal anti-inflammatory drugs, physiotherapy with specific exercises to relax the masticatory muscles, and psychotherapy[15].

Early diagnosis of night bruxism is of great importance. It can be associated with multiple etiological causes that need to be appropriately addressed, thereby affecting the symptoms caused by night bruxism. The consequences of the stomatognathic system with all therapeutic modalities should be to bring the etiological causes under control, to prevent their progression. Of great importance for the academic community is the publication of articles on this issue, for which there is no single solution, so that therapists can find the most optimal therapy for patients diagnosed with night bruxism.

## CONCLUSION

Diagnosed night bruxism presents a high prevalence of occurrence in all age groups and represents a significant oral health issue.

It is concluded that the Covid-19 pandemic is directly affecting the prevalence of night bruxism, which is associated with numerous symptoms such as stress, anxiety, and sleep disturbances.

Prevention should be a challenge for a team of medical and dental specialists who, knowing the mechanisms of night bruxism, will act to prevent the consequences that night bruxism has on the stomatognathic system.

Early diagnosis will allow for early treatment of the stomatognathic system. This way, the risk of developing various oral diseases and their complications can be avoided, and the prosthetic constructions manufactured can last longer.

The therapy of diagnosed night bruxism, and thus of the stomatognathic system, is also a therapy of the overall human health. To date, no permanent cure has been found for diagnosed night bruxism. Therefore, action should be taken to find scientific research centers that will enable in the future not only a palliative, but also a permanent solution to the occurrence of diagnosed night bruxism.

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