



ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2022; 8(2): 74-77
© 2022 IJADS
www.oraljournal.com
Received: 16-12-2021
Accepted: 05-02-2022

Bertha Garza Bernal
Master of Sciences Student,
Universidad Autonoma de Nuevo
Leon, Facultad de Odontologia,
Monterrey, Nuevo Leon, CP, Mexico

Osvelia Esmeralda Rodriguez Luis
Professor, Universidad Autonoma de
Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
Mexico.

Sonia Martha Lopez Villarreal
Professor, Universidad Autonoma de
Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
Mexico.

Sergio Eduardo Nakagoshi Cepeda
Professor, Universidad Autonoma de
Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
Mexico

Evelyn Guadalupe Torres Capetillo
Professor, Universidad Veracruzana,
Facultad de Odontología, Veracruz,
Mexico

Leticia Tiburcio Morteo
Professor, Universidad Veracruzana,
Facultad de Odontología, Veracruz,
Mexico

Monica Sofia Treviño Ramirez
Dentistry Student, Universidad
Autonoma de Nuevo Leon, Facultad
de Odontologia, Monterrey, Nuevo
Leon, Mexico

Juan Manuel Solis Soto
Professor, Universidad Autonoma
de Nuevo Leon, Facultad de
Odontologia, Monterrey, Nuevo Leon,
Mexico

Corresponding Author:
Bertha Garza Bernal
Master of Sciences Student,
Universidad Autonoma de Nuevo
Leon, Facultad de Odontologia,
Monterrey, Nuevo Leon, CP, Mexico

Bruxism in pediatric dentistry during the pandemic COVID-19

Bertha Garza Bernal, Osvelia Esmeralda Rodriguez Luis, Sonia Martha Lopez Villarreal, Sergio Eduardo Nakagoshi Cepeda, Evelyn Guadalupe Torres Capetillo, Leticia Tiburcio Morteo, Monica Sofia Treviño Ramirez and Juan Manuel Solis Soto

DOI: <https://doi.org/10.22271/oral.2022.v8.i2b.1490>

Abstract

Introduction: Bruxism is a behavior that has negative consequences, its prevalence is in 33.65% of children. It can present as probable bruxism, awake bruxism, and sleep bruxism. This has been frequently present during the COVID-19 pandemic.

Objective: Analyze the literature about bruxism and its relationship with signs and symptoms, psychological factors, sleep disorders, screen time, and treatment.

Methodology: Articles on the subject published through the PubMed, SCOPUS and Google Academic databases were analyzed, with an emphasis on the last 5 years. It was carried out with the words "bruxism", "pediatric dentistry", "treatment", "symptoms" and "signs".

Results: The signs and symptoms of bruxism are present more frequently in patients with attention deficit, hyperactivity disorder and with previous bruxism. Stress and anxiety are the psychological factors that influence more the increase of bruxism during the COVID-19 pandemic. Likewise, sleep disturbances have risen, so it is recommended to be more physically active and to reduce screen time to improve health status. Due to the limitations caused by the current pandemic, it is necessary to take advantage of electronic media to guide patients and provide care.

Conclusion: Bruxism has increased during the COVID-19 pandemic. Patients present characteristic signs and symptoms, which are affected by different factors such as stress, anxiety, sleep disturbances and screen time. Due to current limitations, it is important to take advantage of teleodontology to guide and care for patients.

Keywords: Bruxism, pandemic, children, treatment, signs, and symptoms, screen time

1. Introduction

Bruxism has detrimental results which include dental wear, periodontal problems and muscular pain especially in the masticatory muscles and the temporomandibular joint (TMJ) [1]. Bruxism is present in 6% to 50% of children [2], with a prevalence of 33.65% [3].

It is characterized by repetitive and involuntary movements of the jaw in a way that clenches or grinds the teeth [4] and has been described as a behavior [5]. Bruxism can occur when awake or asleep, when awake bruxism (AB) is performed by protrusion of the jaw and is a non-functional behavior, unlike bruxism during sleep (SB) which is performed by the activity of the masticatory muscles which can be rhythmic or non-rhythmic [6].

Confinement by COVID-19 has resulted in the increased likelihood of developing parafunctional habits and bruxism [7]. There is no adequate review of bruxism in pediatric dentistry during the COVID-19 pandemic, therefore, the aim of this article is to analyze the literature on bruxism in relation to signs and symptoms, psychological factors, sleep disturbances, screen time and treatment.

2. Materials and methods

Information from articles published in PubMed, Science Direct, Springer and EBSCO was analyzed with emphasis on the last 5 years. The quality of the articles was analyzed based on

the PRISMA guidelines, i.e., identification, review, choice, and inclusion. The quality of the review was assessed using the measurement instrument for evaluating systemic reviews (AMSTAR-2) [8]. The search was performed using Boolean logical operators AND, OR and NOT. It was realized with the words "bruxism", "pediatric dentistry", "psychological factors", "sleep disturbances", "screen time", "treatment", "symptoms" and "signs", in conjunction with logical Boolean operators OR y AND.

3. Results & Discussion

3.1 Signs and symptoms

The signs and symptoms present are masticatory muscle pain, morning pain, headache, tooth wear, muscle hypertrophy, articular "click", jaw deviation when opening the mouth and/or tongue bites [3], TMJ problems and divergence between the incisal relationship of the teeth can be observed [9]. Of the above mentioned, the most prevalent are wear of the primary canines, tooth wear and headache [3]. The initial sign of probable bruxism is occlusal wear which is usually not detectable [10]. In addition, in preschool patients who present this disruptive behavior, bruxism has been associated with tooth wear and poor sleep quality [11]. Children with a unilateral crossbite and no occlusal relationship often exhibit signs and symptoms of TMJ disorder. In addition, it can cause overjet, overbite, midline deviation, limitation of TMJ movements and opening [9]. When they have mixed dentition, their jaws are deviated when opening the mouth [12], rarely a TMJ sound is heard [13]. Dolichofacial patients have a lower tendency to present sleep disorders which are usually associated with bruxism [14]. Patients with attention deficit hyperactivity disorder often present with AB and SB [15].

The signs and symptoms of bruxism are associated with occlusal wear, pain, TMJ disorder, decreased mouth opening, malocclusions, muscle pain and sleep disorders, which are more frequently present in patients with attention deficit hyperactivity disorder, previous bruxism, etc. These signs are more evident when bruxism is chronically present.

3.2 Psychological Factors

The situation of confinement due to the COVID-19 pandemic has led to increased anxiety, depression and worry, which has contributed to an increase in the prevalence of the development of various harmful behaviors such as bruxism [16]. Some psychosocial factors that may be present in patients with bruxism are anxiety and stress triggered by: emotional tension, family problems, existential crises, anxiety, depression, self-assertion, fear, depression and hostility [17, 18]. In the case of probable sleep bruxism, it may be associated with some of the psychosocial problems due to harmful oral habits [19]. Stress itself is a predictor of bruxism and can be measured by some salivary biomarkers [6, 20]. It has been found that cortisol and salivary amylase production are elevated in patients with anxiety symptoms who present TMJ problems [20]. It is also important to consider that, generally, more than one variable has an influence on the development of bruxism [21]. Another factor that has also been identified as a risk for developing bruxism is separation anxiety [22], which is defined as a reaction to stress in children aged 12 to 18 months who are separated from their parents and attachment is disrupted [23]. Likewise, certain psychological characteristics of the mothers, such as depression and environmental changes that cause stress, influence the children of adolescent mothers to present AB [24].

The psychological factors most frequently affected are stress

and anxiety, which have increased due to confinement. Since these can have great repercussions in children, it is of utmost importance to detect and treat them in a timely manner.

3.3 Sleep Disturbances

Sleep disturbances are those interruptions that affect the quality and timing of sleep [25]. Stress is closely related to sleep disturbances [26]. Confinement by COVID-19 directly influenced the increase in stress, anxiety, depression, and sleep disturbances [27]. The increased occurrence of sleep disturbances was observed especially in the first wave of the pandemic [28], which influences stress and anxiety [29]. This affects the severity of bruxism [30]. Sleep talking and drooling on the pillow are factors found to be associated with AB. In addition, children who wake up at night and those who wake up in fear may have a greater potential for AB [31]. Sleep walking, difficulty getting up in the morning, nocturnal anxiety, sleep-disordered breathing, parasomnias, and resistance to going to sleep are all present in patients with AB [32]. Likewise, AB occurs more frequently in patients with poor sleep quality and who are in the age range of 8 to 10 years old [33].

Patients with sleep disturbances also frequently present bruxism, with a higher incidence during confinement. For this reason, it is recommended that patients engage in more physical activity to improve their state of health.

3.4 Screen Time

Screen time was described by the Canadian Pediatric Society as time spent in a sedentary manner in front of the television screen, playing video games, as well as using the computer or cell phones [34]. This influences the presence of sleep disturbances in infants and preschoolers [35]. This is a factor that has influenced the increase in bruxism during the pandemic. Added to this is the consumption of sugars, which has a possible correlation with sleep bruxism [36]. The use of smartphones for a prolonged period of time is found to be related to AB [37]. This is very important to consider since the amount of time spent using cell phones has greatly increased [38] to the extent that a massive impact of the use of social networks has been reported [39] and its use close to bedtime influences the occurrence of sleep disturbances [40]. It is also important to consider that cell phone addiction also influences the development of bruxism [41].

The time patients spend in front of the screen has increased due to confinement, which influences the development of bruxism. It is therefore recommended to reduce screen time.

3.5 Treatment

Bruxism is multifactorial, so it is necessary to highlight the importance of multidisciplinary management to achieve better results and greater progress. Therefore, the care team for these patients should be made up of physicians, dentists, psychologists, speech therapists and educational programs [31]. There are several methods available for the treatment of this parafunctional behavior, below are some treatments and suggestions that can be considered, especially during the current pandemic confinement. Treatment usually consists of oral appliances and splints to decrease muscle tension, prevent tooth wear and reduce TMJ pain [42]. In children with SB, kinesiotherapy, massage, infrared therapy, low level laser therapy [43] and short exposure time laser acupuncture stimulation [44] may be used. Treatment with drugs such as hydroxyzine and flurazepam [45] can be used. In children with SB, medications can be indicated, for example, buspirone,

which has been reported to be an effective treatment [46]. Likewise, the use of *Melissa officinalis* homeopathic medicine can be used in the treatment when the patient has been diagnosed with possible SB [47, 48]. However, pharmacotherapy with hydroxyzine is the most effective treatment for AB for four weeks [45]. In times of confinement, one can resort to the guidelines available on the internet that are aimed at patient education, home care, relaxation techniques and self-care. The aim is to contribute to reducing the impact of the factors related to bruxism [49]. In addition, it is important that treatment is carried out in a timely manner and can be intervened from the beginning. Nowadays, technology can be used to take advantage of teleodontology to provide remote care to patients [30]. It is also possible to monitor the patient by means of smartphone applications for ecological momentary assessment, for example, the BruxApp [50].

There are many options for the treatment of bruxism, however, during the pandemic there have been limitations, which is why teleodontology can be used to provide care to patients.

4. Conclusions

The most common signs and symptoms of bruxism are: occlusal wear, pain, TMJ disorder, decreased mouth opening, malocclusions, muscle pain and sleep disorders. Stress and anxiety are psychological factors that have a strong influence on the development and continuity of bruxism. Likewise, sleep disturbances influence the patient to present bruxism, and, in turn, this is increased by prolonged time in front of the screen, especially if this is done close to bedtime. In addition, during the pandemic, it is important to take advantage of electronic media to guide the patient through teleodontology.

5. References

- Manfredini D, Lobbezoo F. Role of psychosocial factors in the etiology of bruxism. *J Orofac Pain.* 2009;23(2):153-66.
- Chisini LA, San Martin AS, Cademartori MG, Boscato N, Correa MB, Goettems ML. Interventions to reduce bruxism in children and adolescents: a systematic scoping review and critical reflection. *Eur J Pediatr.* 2020;179(2):177-189.
- Soares JP, Moro J, Massignan C, Cardoso M, Serra-Negra JM, Maia LC, *et al.* Prevalence of clinical signs and symptoms of the masticatory system and their associations in children with sleep bruxism: A systematic review and meta-analysis. *Sleep Med Rev.* 2021;57:101468.
- Alkhatatbeh MJ, Hmoud ZL, Abdul-Razzak KK, Alem EM. Self-reported sleep bruxism is associated with vitamin D deficiency and low dietary calcium intake: a case-control study. *BMC Oral Health.* 2021;21(1):21.
- Leal TR, de Lima LCM, Neves ÉTB, Arruda MJALLA, Perazzo MF, Paiva SM, *et al.* Factors associated with awake bruxism according to perceptions of parents/guardians and self-reports of children. *Int J Paediatr Dent.* 2021.
- Chemelo VDS, Né YGS, Frazão DR, de Souza-Rodrigues RD, Fagundes NCF, Magno MB, *et al.* Is There Association Between Stress and Bruxism? A Systematic Review and Meta-Analysis. *Front Neurol.* 2020;11:590779.
- Carrillo-Diaz M, Ortega-Martínez AR, Romero-Maroto M, González-Olmo MJ. Lockdown impact on lifestyle and its association with oral parafunctional habits and bruxism in a Spanish adolescent population. *Int J Paediatr Dent.* 2021;10.1111/ipd.12843.
- Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, *et al.* AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ.* 2017;358:j4008.
- Yazıcıoğlu İ, Çiftçi V. Evaluation of signs and symptoms of temporomandibular disorders and incisal relationships among 7-10-year-old Turkish children with sleep bruxism: A cross-sectional study. *Cranio.* 2021:1-7.
- Lamenha Lins RM, Cavalcanti Campêlo MC, Mello Figueiredo L, Vilela Heimer M, Dos Santos-Junior VE. Probable Sleep Bruxism in Children and its Relationship with Harmful Oral Habits, Type of Crossbite and Oral Breathing. *J Clin Pediatr Dent.* 2020;44(1):66-69.
- Gomes MC, Neves ÉT, Perazzo MF, Souza EGC, Serra-Negra JM, Paiva SM, *et al.* Evaluation of the association of bruxism, psychosocial and sociodemographic factors in preschoolers. *Braz Oral Res.* 2018;32:e009.
- Restrepo CC, Vásquez LM, Alvarez M, Valencia I. Personality traits and temporomandibular disorders in a group of children with bruxing behaviour. *J Oral Rehabil.* 2008;35(8):585-593.
- Egermark I, Carlsson GE, Magnusson T. A 20-year longitudinal study of subjective symptoms of temporomandibular disorders from childhood to adulthood. *Acta Odontol Scand.* 2001;59(1):40-48.
- Restrepo GLN, Serra-Negra JM, Prado IM, Aguiar SO, Hoffmam GFEB, Pordeus IA, *et al.* Association of facial type with possible bruxism and its related clinical features in adolescents: A cross-sectional study. *Int Orthod.* 2020;18(4):758-769.
- Souto-Souza D, Mourão PS, Barroso HH, Douglas-de-Oliveira DW, Ramos-Jorge ML, Falci SGM, Galvão EL. Is there an association between attention deficit hyperactivity disorder in children and adolescents and the occurrence of bruxism? A systematic review and meta-analysis. *Sleep Med Rev.* 2020;53:101330.
- Emodi-Perlman A, Hochhauser T, Winocur P, Friedman-Rubin P, Eli I. The effect of smartphones on daytime sleepiness, temporomandibular disorders, and bruxism among young adults. *Quintessence Int.* 2021;52(6):548-559.
- Da Costa SV, de Souza BK, Cruvinel T, Oliveira TM, Lourenço Neto N, Machado MAAM. Factors associated with preschool children's sleep bruxism. *Cranio.* 2021:1-7.
- Emodi-Perlman A, Eli I, Smardz J, Uziel N, Wieckiewicz G, Gilon E, Grychowska N, *et al.* Temporomandibular Disorders and Bruxism Outbreak as a Possible Factor of Orofacial Pain Worsening during the COVID-19 Pandemic-Concomitant Research in Two Countries. *J Clin Med.* 2020;9(10):3250.
- Drumond CL, Paiva SM, Vieira-Andrade RG, Ramos-Jorge J, Ramos-Jorge ML, Provini F, *et al.* Do family functioning and mothers' and children's stress increase the odds of probable sleep bruxism among schoolchildren? A case control study. *Clin Oral Investig.* 2020;24(2):1025-1033.
- Kobayashi FY, Gavião MBD, Marquezin MCS, Fonseca FLA, Montes ABM, Barbosa TS, *et al.* Salivary stress biomarkers and anxiety symptoms in children with and without temporomandibular disorders. *Braz Oral Res.*

- 2017 Sep 28;31:e78.
- 21 Kuhn M, Türp JC. Risk factors for bruxism. *Swiss Dent J*. 2018;128(2):118-124.
 - 22 Garmroudinezhad Rostami E, Touchette É, Huynh N, Montplaisir J, Tremblay RE, Battaglia M, *et al*. High separation anxiety trajectory in early childhood is a risk factor for sleep bruxism at age 7. *Sleep*. 2020;43(7):zsz317.
 - 23 Beesdo K, Knappe S, Pine DS. Anxiety and anxiety disorders in children and adolescents: developmental issues and implications for DSM-V. *Psychiatr Clin North Am*. 2009;32(3):483-524.
 - 24 Goetts ML, Poletto-Neto V, Shqair AQ, Pinheiro RT, Demarco FF. Influence of maternal psychological traits on sleep bruxism in children. *Int J Paediatr Dent*. 2017;27(6):469-475.
 - 25 Spruyt K. A review of developmental consequences of poor sleep in childhood. *Sleep Med*. 2019;60:3-12.
 - 26 Altena E, Micoulaud-Franchi JA, Geoffroy PA, Sanz-Arigita E, Bioulac S, Philip P. The bidirectional relation between emotional reactivity and sleep: From disruption to recovery. *Behav Neurosci*. 2016;130(3):336-50.
 - 27 Altena E, Baglioni C, Espie CA, Ellis J, Gavriloff D, Holzinger B, *et al*. Dealing with sleep problems during home confinement due to the COVID-19 outbreak: Practical recommendations from a task force of the European CBT-I Academy. *J Sleep Res*. 2020;29(4):e13052.
 - 28 MacKenzie NE, Keys E, Hall WA, Gruber R, Smith IM, Constantin E, *et al*. Children's Sleep During COVID-19: How Sleep Influences Surviving and Thriving in Families. *J Pediatr Psychol*. 2021;46(9):1051-1062.
 - 29 Peixoto KO, Resende CMBM, Almeida EO, Almeida-Leite CM, Conti PCR, Barbosa GAS, *et al*. Association of sleep quality and psychological aspects with reports of bruxism and TMD in Brazilian dentists during the COVID-19 pandemic. *J Appl Oral Sci*. 2021;29:e20201089.
 - 30 Emodi-Perlman A, Eli I. One year into the COVID-19 pandemic - temporomandibular disorders and bruxism: What we have learned and what we can do to improve our manner of treatment. *Dent Med Probl*. 2021;58(2):215-218.
 - 31 Serra-Negra JM, Ribeiro MB, Prado IM, Paiva SM, Pordeus IA. Association between possible sleep bruxism and sleep characteristics in children. *Cranio*. 2017;35(5):315-320.
 - 32 Us MC, Us YO. Evaluation of the relationship between sleep bruxism and sleeping habits in school-aged children. *Cranio*. 2021:1-9.
 - 33 Massignan C, de Alencar NA, Soares JP, Santana CM, Serra-Negra J, Bolan M, *et al*. Poor sleep quality and prevalence of probable sleep bruxism in primary and mixed dentitions: a cross-sectional study. *Sleep Breath*. 2019;23(3):935-941.
 - 34 Canadian Paediatric Society, Digital Health Task Force, Ottawa, Ontario. Screen time and young children: Promoting health and development in a digital world. *Paediatr Child Health*. 2017;22(8):461-477.
 - 35 Janssen X, Martin A, Hughes AR, Hill CM, Kotronoulas G, Hesketh KR. Associations of screen time, sedentary time and physical activity with sleep in under 5s: A systematic review and meta-analysis. *Sleep Med Rev*. 2020;49:101226.
 - 36 Restrepo C, Santamaría A, Manrique R. Sleep bruxism in children: relationship with screen-time and sugar consumption. *Sleep Med X*. 2021;3:100035.
 - 37 Tinastepe N, Iscan I. Relationship between bruxism and smartphone overuse in young adults. *Cranio*. 2021:1-8.
 - 38 Emodi-Perlman A, Hochhauser T, Winocur P, Friedman-Rubin P, Eli I. The effect of smartphones on daytime sleepiness, temporomandibular disorders, and bruxism among young adults. *Quintessence Int*. 2021;52(6):548-559.
 - 39 Cuello-Garcia C, Pérez-Gaxiola G, van Amelsvoort L. Social media can have an impact on how we manage and investigate the COVID-19 pandemic. *J Clin Epidemiol*. 2020;127:198-201.
 - 40 Tan E, Healey D, Gray AR, Galland BC. Sleep hygiene intervention for youth aged 10 to 18 years with problematic sleep: a before-after pilot study. *BMC Pediatr*. 2012;12:189.
 - 41 Lavigne GJ, Kato T, Kolta A, Sessle BJ. Neurobiological mechanisms involved in sleep bruxism. *Crit Rev Oral Biol Med*. 2003;14(1):30-46.
 - 42 Ortu E, Pietropaoli D, Marchetti E, Marchili N, Marzo G, Monaco A. Bruxism in children: Use of the Functional Plane of Monaco (FPM). *Eur J Paediatr Dent*. 2018;19(4):287-294.
 - 43 Salgueiro MDCC, Bortoletto CC, Horliana ACR, Mota ACC, Motta LJ, Motta PB, *et al*. Evaluation of muscle activity, bite force and salivary cortisol in children with bruxism before and after low level laser applied to acupoints: study protocol for a randomised controlled trial. *BMC Complement Altern Med*. 2017;17(1):391.
 - 44 Nitecka-Buchta A, Walczynska-Dragon K, Batko-Kapustecka J, Wieckiewicz M. Comparison between Collagen and Lidocaine Intramuscular Injections in Terms of Their Efficiency in Decreasing Myofascial Pain within Masseter Muscles: A Randomized, Single-Blind Controlled Trial. *Pain Res. Manag*, 2018, 8261090.
 - 45 Ierardo G, Mazur M, Luzzi V, Calcagnile F, Ottolenghi L, Polimeni A. Treatments of sleep bruxism in children: A systematic review and meta-analysis. *Cranio*. 2021;39(1):58-64.
 - 46 Sağlam E, Akça ÖF. Treatment of Sleep Bruxism With a Single Daily Dose of Buspirone in a 7-Year-Old Boy. *Clin Neuropharmacol*. 2019;42(4):131-132.
 - 47 Silva CT, Primo LG, Mangabeira A, Maia LC, Fonseca-Gonçalves A. Homeopathic therapy for sleep bruxism in a child: Findings of a 2-year case report. *J Indian Soc Pedod Prev Dent*. 2017;35(4):381-383.
 - 48 Tavares-Silva C, Holandino C, Homsani F, Luiz RR, Prodestino J, Farah A, *et al*. Homeopathic medicine of *Melissa officinalis* combined or not with *Phytolacca decandra* in the treatment of possible sleep bruxism in children: A crossover randomized triple-blinded controlled clinical trial. *Phytomedicine*. 2019;58:152869.
 - 49 Almeida-Leite CM, Stuginski-Barbosa J, Conti PCR. How psychosocial and economic impacts of COVID-19 pandemic can interfere on bruxism and temporomandibular disorders? *J Appl Oral Sci*. 2020;28:e20200263.
 - 50 Manfredini D, Bracci A, Djukic G. BruxApp: The ecological momentary assessment of awake bruxism. *Minerva Stomatol*. 2016;65(4):252-255.