PERCEPTION OF BRUXISM HABIT IN CHILDREN AFTER COVID-19

ABSTRACT

Objective: To determine the frequency of child bruxism in the North of Minas after 3 years of the pandemic period. **Materials and methods:** This was a quantitative, cross-sectional, exploratory study with descriptive analysis involving parents/guardians of children aged 2-7 years. A total of 65 valid questionnaires were completed, containing questions about sociodemographic data, perception of clenching and teeth grinding, sleep quality, routine changes during Covid-19, and harmful habits. **Results:** The average age of the children was 4.2 years, with a higher frequency of children between 2-3 years old (24; 36.9%). Sleep bruxism was the most commonly noticed habit by parents (n=35; 55.8%), along with agitation (n=39) and mouth breathing (n=16) during the child's sleep. There was no significant change in bruxism observed due to Covid-19. **Discussion:** Bruxism is an oral parafunction that can compromise the health of the stomatognathic system, and it is identifiable since childhood. In children, other factors such as sleep disturbances and respiratory changes may be associated with bruxism. Stressors can also induce or exacerbate bruxism, although this was not observed in children after the pandemic. **Conclusion:** Parents/guardians of children aged 2-7 years who participated in the study noticed the presence of sleep bruxism, particularly in their children. However, an increase in childhood bruxism cannot be suggested after 3 years of the COVID-19 pandemic.

Keywords: Covid-19**.** Child bruxism. Temporomandibular Joint Disorder. Parafunction

INTRODUCTION

The term bruxism comes from the derivation of the Greek word “bruchein”, which means grinding the teeth or tooth grinding. It was first mentioned in dental literature in 1907 with the expression “la bruxomanie”. Bruxism is characterized as the recurrent, involuntary, and unconscious parafunctional movement of the masticatory jaw muscles and temporomandibular joint, resulting in the habit of clenching and/or grinding the teeth[1].

The act of grinding the teeth, also known as eccentric bruxism, occurs during sleep (sleep bruxism), causing noises and wear of the dental structure, being the parafunction that causes the most damage to the stomatognathic system[2]. However, teeth grinding has recently been considered a protective factor for individuals with airway obstruction (sleep apnea episodes), as the movement attempts to open the airway space, improving breathing during the night[1].

Centric bruxism (awake bruxism) occurs consciously, usually when the individual is awake, resulting in automatic teeth clenching. Teeth clenching leads to various periodontal and dental problems, such as occlusal wear of posterior and anterior incisor teeth, tooth mobility, fractures, headaches, and an overload due to excessive force exerted on the temporomandibular joint[2].

Individual traits of anxiety and stress sensitivity are the relevant conditions associated with bruxism, mainly in awake bruxism, with no link to age. The pathophysiological mechanism of individuals with high levels of stress, anxiety, neuroticism, and responsibility traits tend to release emotional tension, involving sleep bruxism and/or awake bruxism activities[3].

Bruxism in childhood is associated with psychological etiology, having an association with the presence of anxiety, hyperactivity, and stress. Children with psychological problems show a high probability (36% to 40%) of developing bruxism, considered as a mechanism to release tensions from daily life. Anxiety has been the most associated etiology with bruxism[4].

With a prevalence of 5.9% to 49.6%, nocturnal bruxism has become a concern due to its significant impact on children's quality of life[1]. Consequently, parents' perception of frequent and loud nighttime noises becomes the reason for seeking a pediatric dentist, who diagnoses based on investigating possible etiological factors rather than just clinical signs[5].

Although there is no consensus on the etiology, some factors such as psychological conditions, stress, systemic conditions, genetics, and events such as the birth of a sibling, death of a family member, or parental separation can trigger bruxism[6].

The genetic factor is inconclusive, although parents with anxiety tend to be associated with exacerbating bruxism in their children[7]. Thus, the likelihood of a child developing bruxism when their parents have experienced episodes at some point in their lives, especially in childhood, increases by 1.8 times. Additionally, children with respiratory problems such as rhinitis, sinusitis, attempt to clear the airway by moving the jaw, thereby improving breathing and also presenting bruxism[1].

During the COVID-19 pandemic, social isolation deprived children of having interactions with others and in-person school activities. Changes in routine, stress, anxiety, acquisition of unhealthy eating habits, and a significant increase in screen time have been shown as predominant factors associated with bruxism[8].

A large part of children exhibited some behavioral changes during the COVID-19 pandemic. The most consistent behaviors that the child population faced were boredom, anxiety, irritability, restlessness, difficulty sleeping and concentrating, hyperactivity, and fear[9].

Recent literature shows that the COVID-19 pandemic has triggered a significant increase in temporomandibular dysfunction (TMD), with a potential of 49.6% anxiety and 38.9% depression during social isolation[10]. In this sense, the aim of the present study is to determine the frequency of childhood bruxism as perceived by parents/guardians after the COVID-19 pandemic in children aged 2-7 years, in the northern region of Minas Gerais (Brazil). Additionally, it sought to establish the most frequent factors related to the habit, study the frequency of respiratory and gastrointestinal changes, and determine the severity of childhood bruxism after COVID-19 as perceived by parents/guardians.

METHODOLOGY

The present study is a quantitative, cross-sectional, exploratory investigation with descriptive data analysis, conducted with parents or guardians of children residing in the Northern region of Minas Gerais, Brazil.

The population consisted of parents or guardians of children aged 2-7 years, accessed during the study period in the second semester of 2023.

The sample comprised parents or guardians accessed via social networks (WhatsApp/Instagram), of both sexes, aged 18 years or older, residing in the 90 municipalities of the Northern region of Minas Gerais, Brazil. Those who freely agreed to participate in the study by choosing to accept the Informed Consent Form (ICF) were included.

Data collection was performed using a questionnaire adapted from the literature[11] for the study of bruxism frequency and self-perception, self-administered and adapted from previous literature[12], containing 17 multiple-choice and descriptive questions about bruxism and deleterious habits.

Participants were approached randomly by sending the questionnaire link via WhatsApp/Instagram, thus conducted online via the Google Forms platform. The sample in question was a convenience sample, composed of parents or guardians who volunteered to participate in the research.

The study execution steps followed the ethical criteria for research involving human subjects, as outlined in Resolution No. 466/12 of the National Health Council. Initially, the project was submitted for review and approved by the Ethics Committee of FUNORTE (CEP/FUNORTE), opinion no. 6,253,278. Upon approval, the questionnaire was digitally administered using Google Forms. The questionnaires were sent to participants through WhatsApp/Instagram groups of each academic researcher, ensuring ethics and confidentiality in the data collection process. Data collection took place in September and October 2023.

Descriptive data analysis was conducted using the SPSS® statistical program version 18.0. Descriptive statistics such as mean, standard deviation, relative frequency, and 95% confidence interval were initially utilized.

The study execution steps were submitted for review by the Research Ethics Committee involving human subjects of the CEP/FUNORTE, through the Brazil Platform. This study was conducted following the ethical criteria for research involving human subjects, as outlined in Resolution No. 466/12 of the National Health Council.

RESULTS

The questionnaires were answered by 82 participants from the northern region of Minas Gerais, parents or guardians of children aged 2-7 years. A total of 17 questionnaires were excluded: one belonged to a minor, four were not from the northern region of Minas Gerais, one had inconsistent responses, five were from parents of children under 2 years old, and six were from children over 7 years old. Therefore, 65 valid questionnaires were used for data analysis. Mostly, the questionnaires were answered by the children's mothers (n=52), while only 7 questionnaires were answered by fathers, another relative (n=5), or a non-relative guardian (n=1).

The sociodemographic data of the study's parents/guardians are presented in Table 1, and a higher frequency of female participants (n=58; 89.2%), married individuals (n=43; 66.2%), with a family income between 1-3 minimum wages (n=35; 53.8%), and an education level of more than 10 years of study (n=38; 58.5%) was observed.

The children's age ranged from 2 to 7 years, with a mean of 4.2 years, and a higher frequency of children aged 2-3 years (24; 36.9%), followed by the age group between 4-5 years (n=23; 35.38%) and 6-7 years (n=18; 27.69%)- data not presented graphically.

Among the participants, 63 (96.9%) reported having prior knowledge of bruxism. Perception of nocturnal bruxism was more frequent (n=31; 49.2%) than perception of dental clenching (n=13; 20.6%) - Figure 1. Figure 2 indicates the perception of parents/guardians regarding the parafunctional habit. Noises made by the child during the night (n=11; 17.5%) and tooth wear (n=10; 15.9%) were the most frequent forms of perception of sleep bruxism, while the perception of daytime clenching by parents/guardians was challenging (do not know how to respond - n=8, 12.7%).

A total of 37 (56.9%) parents/guardians considered their child to be calm and tranquil, and 21 (32.3%) considered them to be restless and hyperactive (data not shown graphically). However, for 32.3% of parents/guardians (n=21), the parafunctional habit was related to moments and factors of stress.

Among the participants, 39 parents/guardians (60%) observed restlessness in the child during sleep, but 16 also confirmed that the child breathes through their mouth during the night- data not presented graphically.

Most parents/guardians do not remember the onset and observation of parafunctional habits in children (n=38; 60.3%); however, dental clenching or teeth grinding was perceived by 15 participants from 2020-2022 (Figure 3).

In 2023, only 3 (4.8%) children showed the parafunction more frequently, and 11 (17.5%) had the same frequency as always, according to the perception of parents/guardians (Figure 4).

Other parafunctional habits observed by the hands are presented in Figure 5.

DISCUSSION

Bruxism is an oral parafunction that can compromise the health of the stomatognathic system due to the forces exerted by the orofacial musculature, leading to wear of dental elements, tooth mobility, fractures, headaches, earaches, and temporomandibular joint (TMJ) disorders. It is crucial that the diagnosis of bruxism be early and accurate to enable prevention of damage [5,2].

It is known that the prevalence of bruxism in children is considerable, negatively impacting their quality of life[2]. Literature suggests that bruxism in children has a higher prevalence than in adults, ranging from 3.5% to 40.6%, with no prevalence difference based on gender[2]. The frequency of bruxism perception in the children of the study was higher than in the literature, around 50% for sleep bruxism.

Usually, the diagnosis of bruxism is obtained based on personal reports through conversations with the children's parents, signs and symptoms through clinical evaluation, and polysomnography, although it is not widely used due to its high cost. The level of perception of parafunction by the parents/guardians involved in the present study was high, with almost 80% perceiving the

parafunctional habit in their children. In conversations with parents, it is important to investigate medical history, systemic changes, children's habits, lifestyle, audible sounds during sleep, as well as social and family relationships. In clinical evaluation, it is important to check for dental wear, cheek and tongue imprints, audible sounds in the TMJ, palpation sensitivity of the chewing muscles, and masseter muscle hypertrophy[15]. Providing guidance to parents about childhood bruxism is an important and effective therapeutic approach.

Psychological factors are linked to childhood bruxism, as children release more emotional tension, have habits of biting objects, nail biting, and there is also the issue of the child's need for attention, anxiety, and stress, which can exacerbate their parafunctional habits[3].

It is noteworthy the number of children in the study who presented bruxism, respiratory difficulties, and agitation during sleep simultaneously. Mouth breathing is also linked to childhood bruxism[9]. Blockage of airflow in the upper airways causes more frequent micro-awakenings, promoting shallow sleep when teeth grinding occurs. It is important to remember that bruxism serves as a protective mechanism against upper airway obstruction, assisting in restoring its permeability during sleep[15].

It is known that most children showed behavioral changes during the Covid-19 pandemic. Studies show that the most frequent behaviors were boredom, anxiety, irritation, restlessness, difficulty sleeping, difficulty concentrating, hyperactivity, and fear. Therefore, psychological factors associated with the pandemic led to a higher risk of development and worsening of bruxism[4].

Children were the most affected group in the pandemic, in terms of health, due to their greater vulnerabilities to the impacts of stress and anxiety events, and thus more susceptible to developing psychological problems that affect physical and oral health, such as bruxism. However, for the present study, there was no significant alteration in parafunctional habits due to Covid-19.

CONCLUSION

Parents/guardians of children aged 2-7 years who participated in the study noticed the presence of sleep bruxism, particularly in their children. Changes in sleep and difficulty with mouth breathing were observed by the parents. However, it cannot be suggested that there was an increase in childhood bruxism after 3 years of the COVID-19 pandemic, as literature has emphasized. It is important to note that the number of parents/guardians involved was still limited to establish statistically significant conclusions, remaining as a limitation of the study.

Table 1: Socioeconomic Aspects of Study Participants.

	FREQUENCY	PERCENTAGE
	N	(%)
Age range of study participants' guardians		
Between 18-30 years	25	38,463%
Between 31-40 years	31	47,69%
Above 41 years	9	13,84%
Family income (in minimum wage)		
No income	4	3,4%
Less than 1 minimum wage	26	22,4%
From 1 to 3 minimum wages	64	55,2%
From 4 to 5 minimum wages	13	11,2%
More than 5 minimum wages	9	7,8%
Education		
Up to 2 years of schooling	8	6,9%

Between 3 to 5 years of schooling	8	6,9%
Between 5 to 7 years of schooling	8	6,9%
Between 7 to 10 years of schooling	21	18,1%
More than 10 years of schooling	71	61,2%

Fig. 1A Have you ever seen your children grinding their teeth during the night?

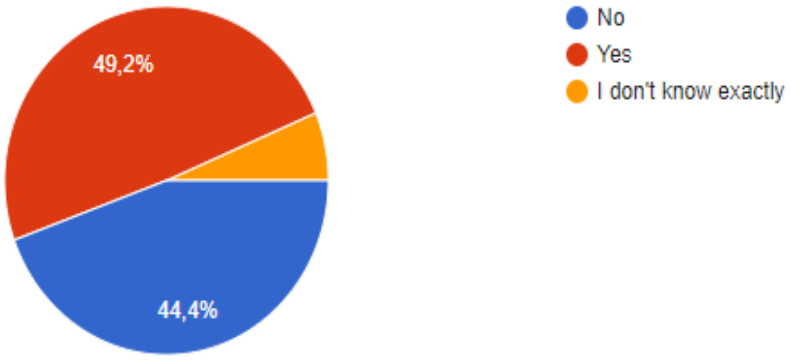


Fig. 1B Have you observed if the child clenches their teeth during the day? Or has the child reported clenching themselves?

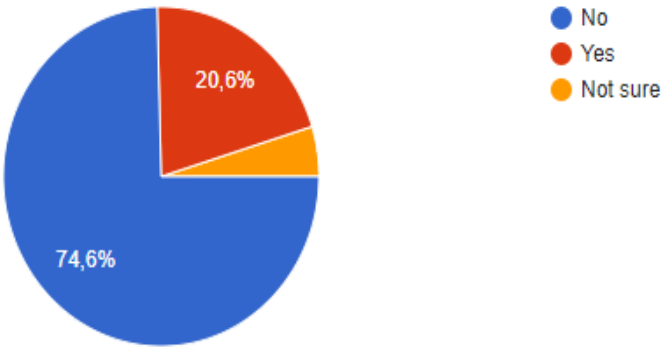


Fig. 2A How did you realize your children grind their teeth during the night?

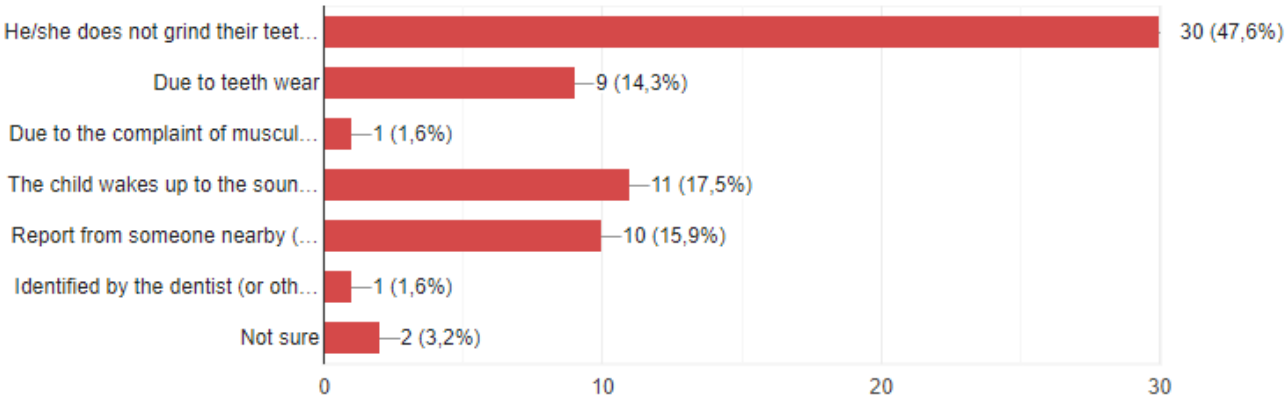


Fig. 2B How did you discover your child's teeth clenching?

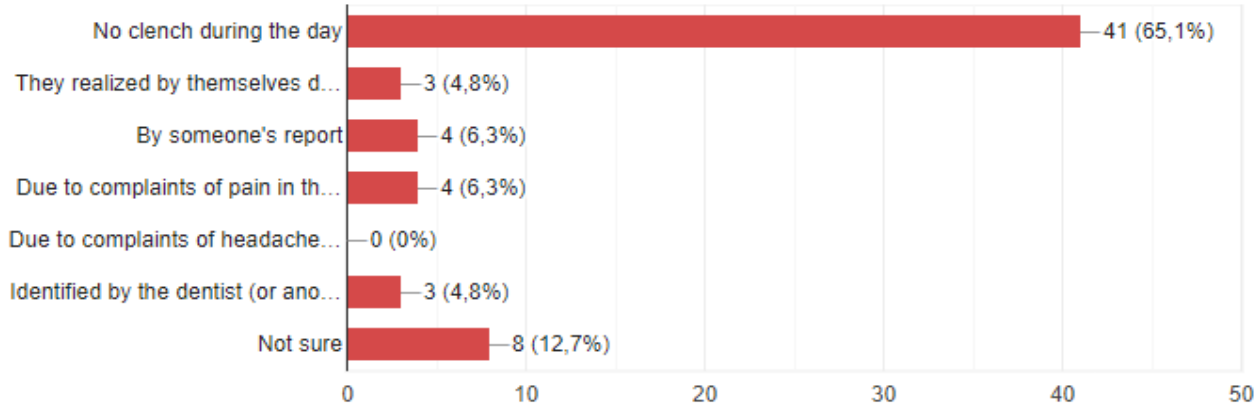


Fig. 3 Do you remember the moment when you noticed your child's habit of clenching or grinding their teeth?

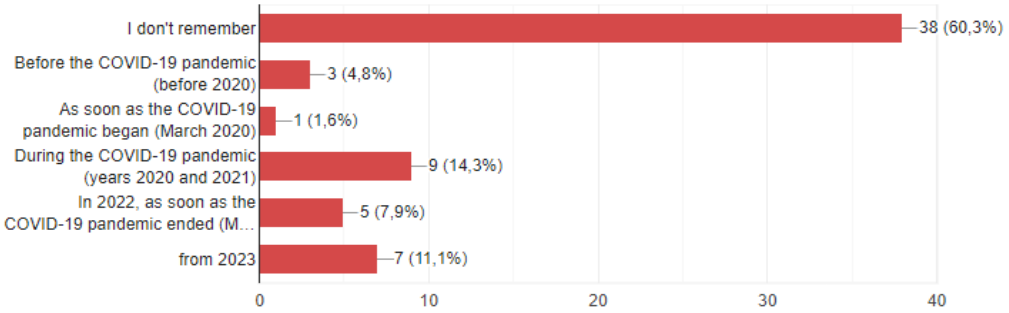


Fig. 4 At this exact moment, do you consider that

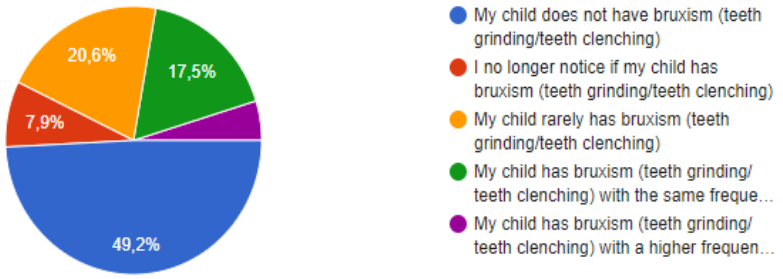
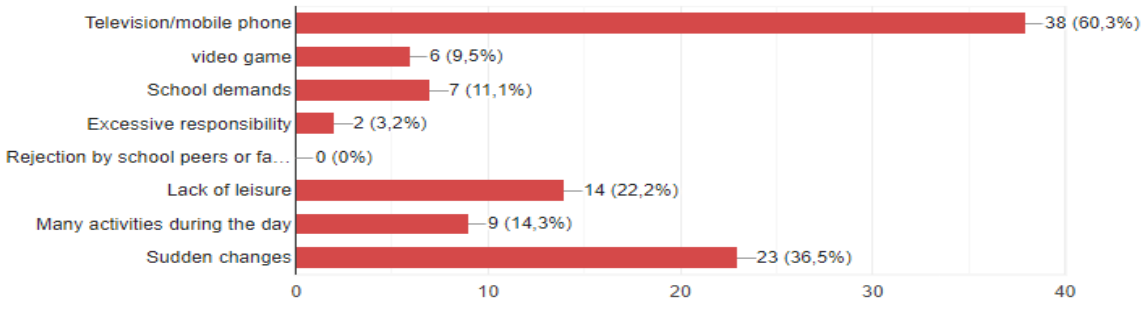


Fig. 5 Please indicate the stressor(s) for your child in their daily life?



Ethics Committee Approval: FUNORTE: No. 6.253.278

REFERENCES

1- Dos Santos JF, Da Silva FDF, Dias GF. Etiological factors associated with childhood bruxism. Dentistry. 2021 Nov 18;29(57):47–54.

2- Kelm M, Ferreira M, Algayer E, Nunes G, Souza Passoni D, Amorim I. CHILDHOOD BRUXISM: ETIOLOGIES, DAMAGES AND TREATMENTS. Rev Cient Odonto [Internet]. 2019 [cited 2023 Nov 11];(1):78. Available from: http://revistas.fasipe.com.br:3000/index.php/rco/article/download/8/8

3- Mota IG, Ton LAB, Paula JSD, Martins APVB. Cross-sectional study of self-reported bruxism and its association with stress and anxiety. UNESP Dentistry Magazine [Internet]. 2021 Jul 9;50. Available from: https://www.scielo.br/j/rounesp/a/ryNvmVcFCx3yHKLfBLdtTNJ/

4- Oliveira Hanna LM, Silva da Silva JL, Carvalho Pereira SN. ETIOLOGY OF CHILDHOOD BRUXISM. Education Magazine - UNG-Ser. 2022 Aug 15;17(3):64.

5- The approach to bruxism in a child patient: case report | Electronic Magazine Acervo Saúde. acervomaiscombr [Internet]. 2020 Nov 9 [cited 2023 Nov 11]; Available from: https://acervomais.com.br/index.php/saude/article/view/4433

6- Dos Santos TR, Pintor AVB, Imparato JCP, Tannure PN. CONTROL OF SLEEP BRUXISM IN CHILDHOOD: LITERATURE REVIEW. Rev Rede Cuid Saúde [Internet]. 2020 [cited 2023 Nov 11];[62-76]. Available from: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-1116342

7- Rédua RB, Kloss PCA, Fernandes GB, Silva PLF da. Bruxism in childhood, contemporary aspects in the 21st century, systematic review. Full dent sci [Internet]. 2019;131–7. Available from: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-1024262

8- Amaral RC. COVID-19 and its impact on the increase in bruxism in children and adolescents: an integrative review. Brazilian Journal of Development. 2022 Nov 14;8(11):73237–47.

9- Nogueira AC, Santo AL do P do E, Sena HS, Cruz SG da S, Macedo SA, Vidigal BCL. Child bruxism associated with the Sars-Cov-2 pandemic: a literature review. LIBERTAS ODONTOLOGIA [Internet]. 2022 Dec 16 [cited 2023 Nov 11];1(1). Available from: https://periodicos.famig.edu.br/index.php/odonto/article/view/287

10- Torres JLM, Melo MM de A, Gonçalves JG de A, Diniz ENS, Guênes GT, Correia AC de C, et al. The influence of anxiety caused by the COVID-19 pandemic on temporomandibular disorders and bruxism. Research, Society and Development [Internet]. 2022 Jun 6 [cited 2022 Sep 29];11(8):e1611830580–0. Available from: https://rsdjournal.org/index.php/rsd/article/view/30580

11- De Alencar VRCT, Cavalcante M, Firmino R, Santos J, De Lima JPM. COMPOSITE RESIN REPAIR: SYSTEMATIC REVIEW. Journal of Dentistry & Public Health. 2018 Jun 25;9(1):47–54.

12- Guimarães GG, Alexandria A, Duarte ML, Letieri A dos S, Soares TRC. RUXISM IN CHILDHOOD: A CHALLENGE FOR DENTISTRY. UNINGÁ Magazine. 2021 Mar 11;58:eUJ3547–7.

13- de Carmo GP, de Gutierrez GM, Bonacina CF, Domingues NB. FACTORS ASSOCIATED WITH CHILDHOOD SLEEP BRUXISM: A REVIEW OF

LITERATURE [Internet]. UNG-SER RS, editor. UNG-SER Health Magazine; 2022 [cited 2023 Nov 11]. Available from: https://www.researchgate.net/publication/370566835_FATORES_ASSOCIADOS_AO_BRUXISMO_DO_SONO_INFANTIL_UMA_REVISAO_DE_LITERATURA

14- Fernando Pessoa U. Sara Diana Costa Gonçalves Bruxism in pediatric dentistry - cross-sectional study [Internet]. [cited 2023 Nov 13]. Available from: https://bdigital.ufp.pt/bitstream/10284/11516/1/PPG_36369.pdf

15- Nogueira AC, Santo AL do P do E, Sena HS, Cruz SG da S, Macedo SA, Vidigal BCL. Child bruxism associated with the Sars-Cov-2 pandemic: a literature review. LIBERTAS ODONTOLOGIA [Internet]. 2022 Dec 16;1(1). Available from: https://periodicos.famig.edu.br/index.php/odonto/article/view/287/215