PARENTAL PERCEPTION OF CHILDHOOD BRUXISM THREE YEARS AFTER THE COVID-19 PANDEMIC

ABSTRACT

Objective: To determine the frequency of child bruxism in the North of Minas Gerais three years after 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 can be identified since childhood. In children, 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 in their children. However, an increase in childhood bruxism cannot be suggested three years after 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 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[16]. 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 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 both sleep bruxism and 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 commonly 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 the condition by investigating possible etiological factors rather than relying solely on clinical signs[5].

Although there is no consensus on the etiology, factors such as psychological conditions, stress, systemic conditions, genetics, and events like 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[7]. 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 interactions with others and in-person school activities. Changes in routine, stress, anxiety, the acquisition of unhealthy eating habits, and a significant increase in screen time have been shown as predominant factors associated with bruxism[8].

Many children exhibited behavioral changes during the COVID-19 pandemic. The most consistent behaviors observed in the child population 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 49.6% of cases associated with anxiety and 38.9% with depression during social isolation[10]. In this context, the present study aims to determine the frequency of childhood bruxism as perceived by parents/guardians in children aged 2-7 years after the COVID-19 pandemic in the northern region of Minas Gerais, Brazil. Additionally, it seeks to identify the most frequent factors related to the habit, examine the frequency of respiratory and gastrointestinal changes, and assess 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.

This study was approved by the Ethics Committee of FUNORTE under opinion number 6,253,278. It followed ethical criteria for research involving human subjects as outlined in Resolution N^0 466/12 of the National Health Council.

The population included parents or guardians of children aged 2-7 years accessed during the second semester of 2023. The convenience sample comprised individuals contacted through social networks (WhatsApp/Instagram), of both sexes, aged 18 years or older, and 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 conducted using a questionnaire adapted from the literature[11] to study the frequency of bruxism and self-perception. This self-administered questionnaire, adapted from previous literature[12], comprised 17 multiple-choice and descriptive questions related to bruxism and deleterious habits.

Participants were randomly approached by sending the questionnaire link via WhatsApp/Instagram, and data collection was conducted online using the Google Forms platform. The sample used in this study was a convenience sample, consisting of parents or guardians who volunteered to participate in the research.

The questionnaire was administered digitally using Google Forms. The questionnaires were sent to participants through WhatsApp/Instagram groups managed by each academic researcher, ensuring ethical standards 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.

RESULTS

The questionnaires were answered by 82 participants from the northern region of Minas Gerais, who were 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. Among these, the majority were completed by the children's mothers (n=52), while only 7 being completed by fathers (n=7), 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. 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%).

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 play a significant role in childhood bruxism. Children may exhibit behaviors such as biting objects or nails, which can stem from emotional tension, anxiety, or stress. Additionally, the need for attention may contribute to the development or exacerbation of parafunctional habits[3].

It is noteworthy that a significant number of children in the study exhibited bruxism, respiratory difficulties, and agitation during sleep concurrently. Additionally, mouth breathing has been associated with childhood bruxism[9]. Obstruction of airflow in the upper airways leads to more frequent micro-awakenings, resulting in shallow sleep, which is conductive to teeth grinding. It is important to recognize that bruxism may serve as a protective mechanism against upper airway obstruction, aiding in the restoration of airway permeability during sleep[15].

It is known that a majority of children exhibited behavioral changes during the Covid-19 pandemic. Studies indicate that the most common behaviors included boredom, anxiety, irritability, restlessness, difficulty sleeping, trouble concentrating, hyperactivity, and fear. Consequently, psychological factors associated with the pandemic increased the risk of developing or exacerbating bruxism[4].

Children were one of the most affected groups during the pandemic, particularly in terms of health, as they are more vulnerable to the effects of stress and anxiety. Consequently, they are more susceptible to developing psychological issues that can affect their physical and oral health, such as bruxism. However, in the present study, there were no significant changes observed in parafunctional habits due to Covid-19.

The study's limitations are confined to the convenience sample employed and the lack of longitudinal observation to monitor habits over time. Furthermore, the study relies on parents' or guardians' perceptions, which may introduce biases. Future studies are warranted to conduct a more comprehensive analysis of the psychological factors associated with bruxism in this age group. Additionally, this study did not include comparisons of bruxism prevalence between the pre- and post-COVID-19 periods.

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 patterns and difficulties 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 emphasized in the literature. It is important to note that the number of parents/guardians involved was still limited to establish statistically significant conclusions, which remains a limitation of the study.

Consent

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

Ethics Approval: As per international standards or university standards written ethical approval has been collected and preserved by the author(s).FUNORTE: No. 6.253.278

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc have been used during writing or editing of manuscripts. This explanation will include list the name, version, model, and source of the generative AI technology and as well as the all input prompts provided to a generative AI technology

Details of the AI usage are given below:

1.

2.

3.

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%

Have you ever seen your children grinding their teeth during the night?

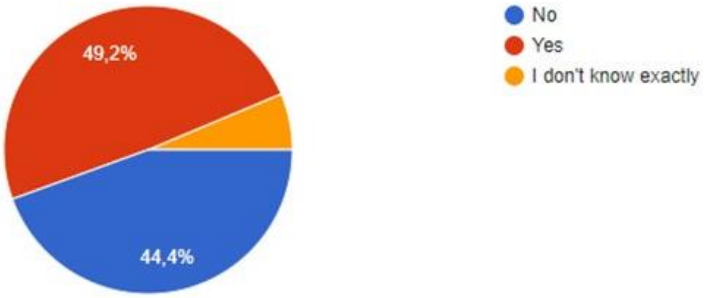


Fig. 1A

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

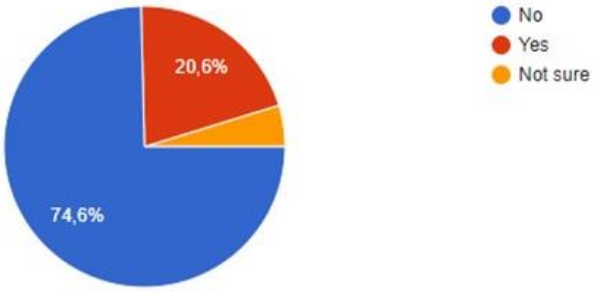


Fig. 1B

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

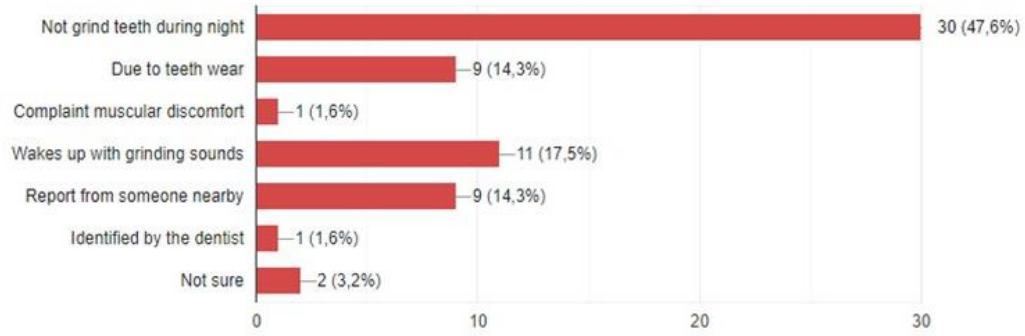
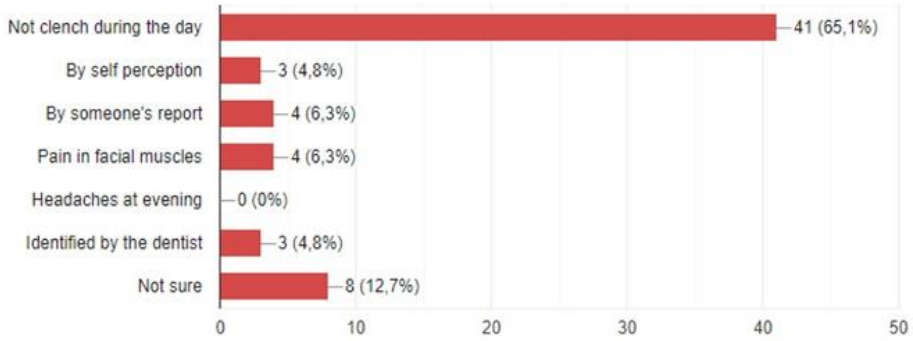


Fig. 2B How did you discover your child's teeth clenching?



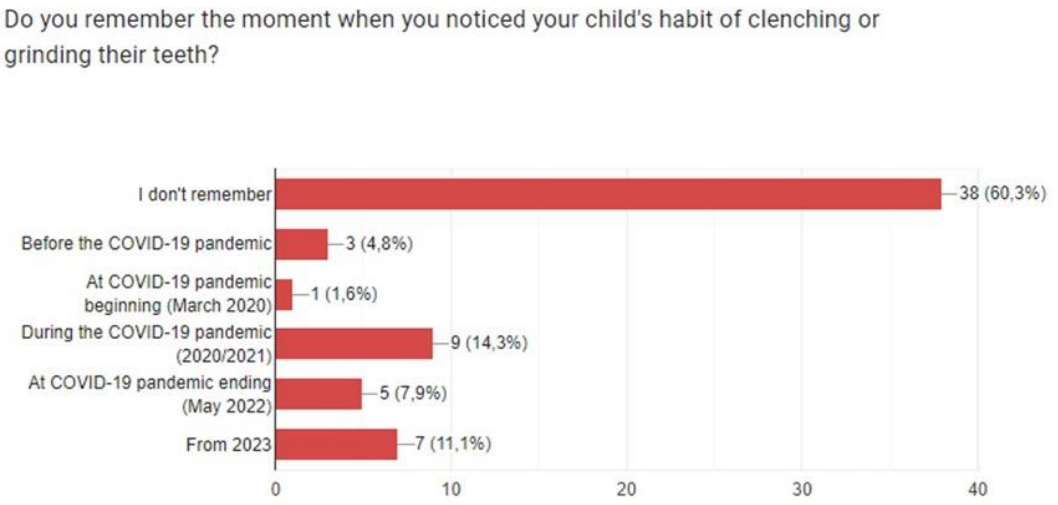

Do you remember the moment when you noticed your child's habit of clenching or grinding their teeth?
I don't remember
38 (60,3%)
Before the COVID-19 pandemic
3 (4,8%)
At COVID-19 pandemic beginning (March 2020)
1 (1,6%)
During the COVID-19 pandemic (2020/2021)
9 (14,3%)
At COVID-19 pandemic ending (May 2022)
5 (7,9%)
From 2023
7 (11,1%)
0
10
20
30
40

Fig. 3

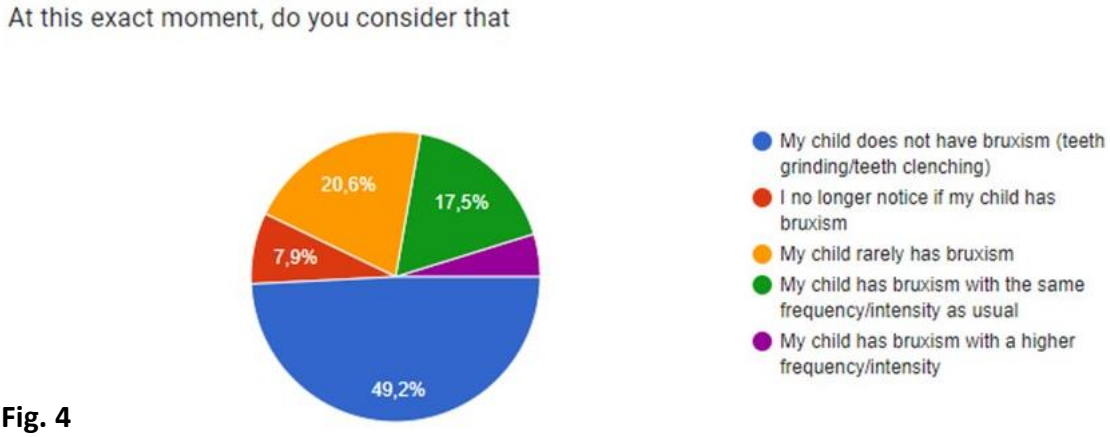

At this exact moment, do you consider that
20,6%
17,5%
7,9%
49,2%
My child does not have bruxism (teeth grinding/teeth clenching)
I no longer notice if my child has bruxism
My child rarely has bruxism
My child has bruxism with the same frequency/intensity as usual
My child has bruxism with a higher frequency/intensity

Fig. 4

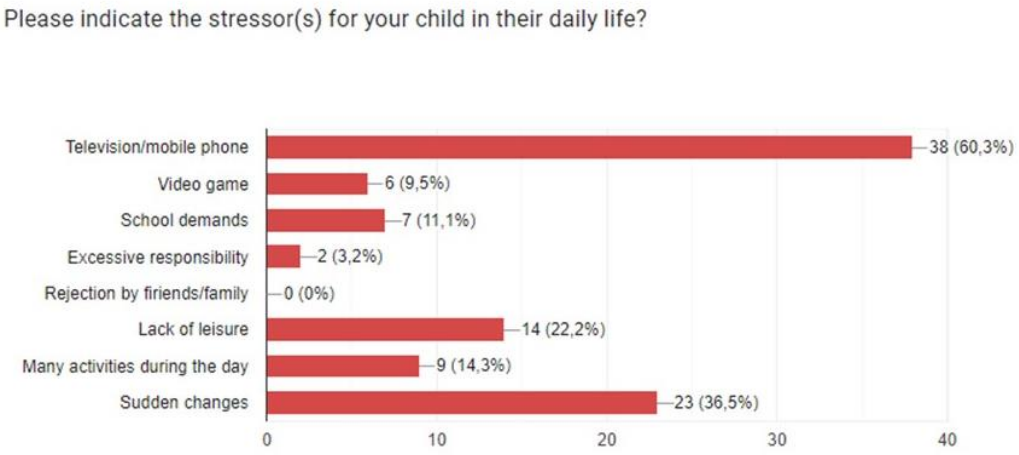

Please indicate the stressor(s) for your child in their daily life?
Television/mobile phone
38 (60,3%)
Video game
6 (9,5%)
School demands
7 (11,1%)
Excessive responsibility
2 (3,2%)
Rejection by firiends/family
0 (0%)
Lack of leisure
14 (22,2%)
Many activities during the day
9 (14,3%)
Sudden changes
23 (36,5%)
0
10
20
30
40

Fig. 5

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