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Original Research Article

Little grinder, big concern - a questionnaire survey

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ABSTRACT

Background: Bruxism in paediatric dentistry refers to the habitual grinding or clenching of teeth in children. This condition can manifest during the day or night and may have various underlying causes. Bruxism has multifactorial etiology including disturbed sleep cycle and excessive gadget use in children. Present study aimed to evaluate the knowledge and awareness of parents about bruxism in children who visited the department. Bruxism is a common concern in paediatric dentistry, presenting challenges for dental professionals and parents alike in managing and addressing its effects on a child's oral health.
Methods: The study was conducted among the parents visiting the Department with their children for the treatment. A self-administered questionnaire about knowledge and awareness regarding bruxism habit, sleep cycle, and gadget use in children was made. It was shared with parents using E-methods. Data was collected and statistical analysis was done.
Results: In this study, parents stated that 74.1% of children grind their teeth, and 63% of children did so while using the device. Children most frequently utilized mobile devices (51.9%), then TV (13%), electronic toys and video games (11.10%), laptops/PCs and tablets (6.50%). Before falling asleep, 81.50% of the kids used their gadgets, and after using them, 60.20% of the kids reported having trouble sleeping.
Conclusions: According to this study, children who clench their teeth have disrupted sleep, and clenching of teeth is more common in children who experience stress as a result of prolonged use of gadgets. Thus, a significant relationship was seen between children's use of gadgets, sleep disruption, and bruxism.

Keywords: Bruxism, Sleep cycle, Gadget use, Children, Paediatric dentistry, Knowledge

INTRODUCTION

Bruxism has become an increased concern in recent years. It has an impact on the quality of the person lives mostly in children. Bruxism is an important risk factor for temporomandibular disorders. It causes occlusal wear of teeth and progressively can lead to dental trauma in severe cases. According to previous studies, bruxism is considered as a more important concern in children. The causative factors of bruxism are functional, structural and the psychological factors. It comes under the parafunctional activities of the children leading to damage of the stomatognathic system. It results in the bad quality of sleep.[1]

Bruxism is a repetitive jaw muscle activity characterized by the clenching or grinding of teeth and/or bracing or thrusting of the mandible.[2] It distinguishes between two separate masticatory muscle activities based on their circadian manifestation: awake bruxism (AB) and sleep bruxism (SB).[3] One of the most prevalent types of bruxism, sleep bruxism, is regarded as a movement disorder associated with sleep. Many therapy strategies have been proposed in past studies, but no consensus on the most effective treatment methodology is provided.[4] It

is uncertain what causes these bruxism problems. Due to multifactorial influence of the central nervous system, genetic and psychosocial factors, the sleep- wake cycle is disturbed and the motor activities are impaired.[5]

Previous investigations have revealed that the prevalence of bruxism is non-specific. This is due to the complexity of diagnosing bruxism and the variety of treatment options. Bruxism's adverse effects include headaches, hypermobility, gingival recession and inflammation, discomfort and hypertrophy of the masseter muscles, and degenerative changes in the temporomandibular joint.[6]

Bruxism is more frequent in children than in adults, with prevalence rates ranging from 3.5% to 40.6% and no gender preference. Previous research has shown that aware parents inquire about their children's bruxism habit when signs and symptoms appear. This will assist doctors in treating the underlying causes of the bruxism habit.[7]

The use of technology and gadgets by children is one of the etiological reasons for bruxism. According to Suhana et al, the majority of kids use their devices for an average amount of time. Children enjoy themselves by using these devices to play games, watch videos, listen to music, and more. They spend most of their time on their gadgets, and they don't care about their sitting posture, screen brightness, vision, or health.[8]

These devices have a number of negative impacts that come with using them, including increased eye strain from brightness, inflammation of the eyes, trouble focusing, and more. According to earlier research, children are more likely than adults to experience negative consequences from using technology. According to a 2013 study, 29% of toddlers pick up technology very quickly, and by the time they enter primary school, 70% of them have mastered it.[9]

Globally, information technology is important to the current generation. The children's emotional and social development is compromised. The children are impacted by its use in both positive and negative ways. Its effects are determined by the frequency and duration of device use, as well as supervision from parents. According to past research, the majority of parents let their kids use technology without any supervision or control.[10] This may have a great impact on the children's mental health and increase in stress is observed. Parents should be aware of their children's usage of gadgets and they should be given awareness about the adverse effects of these technologies.

It is difficult to evaluate and identify bruxism. Adult bruxism diagnosis can be confirmed by clinical signs and symptoms such as pain, temporomandibular joint problems, headache, and masticatory muscular hypertrophy. These symptoms and indicators haven't been proven in children yet, though.[11] Therefore, parental reports are one of the most essential characteristics in the diagnosis of bruxism in the absence of quantitative evidence (e.g., sleep recordings), because teeth grinding produces characteristic noises in children that are easily recognized by family members.[12]

Furthermore, parents must be aware of and knowledgeable about these para-functional behavioural symptoms in order to seek proper treatment. However, there have been few studies measuring families' knowledge of their children's bruxism. Therefore, the purpose of this study was to assess parent's knowledge concerning bruxism, sleep cycle and gadget use in children who visited the paediatric dentistry department.

METHODS

The study aims to assess and enhance the knowledge of parents regarding bruxism in children, as well as the association between sleep and gadget use. Ethical approval was obtained from the ethics committee of Rishiraj College of Dental Sciences and Research Centre, Bhopal, Madhya Pradesh. The sample size was determined using Open Epi software, with a minimum sample size of 105 at a 99% confidence level, and a total of 108 participants were included in the study. The parents were randomly selected from the regular outpatient department (OPD) of the Department of Paediatrics and Preventive Dentistry at Rishiraj College of Dental Sciences and Research Centre, Bhopal, Madhya Pradesh. It was a cross-sectional questionnaire-based study conducted from November 2023 to February 2024.

Out of all the parents visiting the department for their children's regular check-ups and treatment during this time, 108 agreed to participate and gave their consent. The data were collected using a self-administered questionnaire. Questionnaire was shared to parents using E-method (Google form link). The parents filled out the questionnaire in a waiting room while the child was undergoing dental treatment.

The questionnaire was designed in a simple manner and consisted of 21 questions about parents' awareness and knowledge about bruxism in children and to examine the relationship between children's sleep patterns and their use of gadgets. To ensure that everyone could comprehend it, it was also translated into a regional form of Hindi. As a result, precise outcomes were achieved.

Inclusion criteria

Inclusion criteria include: parents with children aged between 3 and 13 years, parents accompanying their children on a dental visit, parents who agreed to participate in the survey, and parents literate in Hindi and English.

Exclusion criteria

Exclusion criteria include: parents who refused to participate the survey, and guardians other than the parents (e.g., grandparents, foster parents).

Statistical analysis

Data collected via the online questionnaire was distributed based on various parent responses. Validity and reliability of the study were assessed to ensure accurate results. Data was tabulated using statistical package for the social sciences (SPSS). Analysis was conducted based on the responses to derive results.

RESULTS

In this study, age of the children was ranged from 3 years to 13 years. There was higher participation of age groups of 6 to 10 years than the other age groups and the majority of the children were male (Table 1).

Table 1: Demographic data of patient participated in the study.

Age group (years)	Girls (%)	Boys (%)	Total (%)
3-5	5 (4.63)	8 (7.41)	13 (12.04)
6-10	25 (23.15)	50 (46.30)	75 (69.45)
11-13	5 (4.63)	15 (13.89)	20 (18.52)
Total	35 (32.41)	73 (67.59)	108 (100)

On assessing the parental knowledge about bruxism, 57.4% of parents were aware of the teeth grinding habit in children. 29.6% of parents reported having the habit of grinding their own teeth while working or resting. 74.1% of parents observed bruxism in their children (Table 2).

In this study, the sleep cycle and gadget use in children were thoroughly assessed. According to the findings, 74.1% of parents reported that their children slept peacefully. When it came to sleep duration, 57.4% of children were sleeping for 8-10 hours, 27.8% for 6-7 hours, and 14.8% for 10-12 hours (Table 2).

Despite these seemingly healthy sleep patterns, a significant 63% of parents observed teeth grinding in their children while they were using gadgets. The most commonly used gadget among children was mobile phones, with 51.9% of children frequently using them. This was followed by television (13%), electronic toys and video games (11.1%), and laptop/PC and tablets (6.5%) (Figure 3). The most repeated activity on gadgets was playing video games, which 58.3% of children engaged in, followed by watching entertainment videos (30.6%) and educational videos (6.5%) (Figure 3).

In terms of the duration of gadget use, 54.6% of children used gadgets for 1-2 hours daily, 20.4% for 2-4 hours, 6.5% for more than 4 hours, while 1.9% of children never used any gadgets. Additionally, 81.5% of children used gadgets before sleep, and sleep disturbances were reported in 60.2% of children following gadget use (Figure 3).

Table 2: Assessment of knowledge of parents regarding the grinding habit of children (n=108).

Questions and options	N	%
Are you aware of grinding of teeth?		
Yes	62	57.4
No	46	42.6
Do you grind your teeth while working/ resting?		
Yes	32	29.6
No	76	70.4
Did you observed grinding of teeth in your child?		
Yes	80	74.1
No	28	25.9
Does your child sleep peacefully?		
Yes	80	74.1
No	28	25.9
How many hours do your child sleeps?		
6-7	30	27.8
8-10	62	57.4
10-12	16	14.8
More than 12	0	0.0
Do you think, grinding of teeth by your child may cause deleterious effects?		
Yes	82	75.9
No	26	24.1
Have you noticed that grinding habit is wearing down the teeth?		
Yes	56	51.9
No	52	48.1
Do you think, grinding of teeth, excessive use of gadgets and sleep pattern of child may be associated with each other?		
Yes	73	67.6
No	35	32.4
Do you know about the adverse habits like mouth breathing, lip biting and thumb or digit sucking?		
Yes	62	57.4
No	46	42.6
If yes, will you prefer to visit a paediatric dentist for the treatment of this harmful habits?		
Yes	95	88
No	13	12

In our study, parents reported various symptoms related to teeth grinding in their children. Notably, 57% of children did not experience any symptoms. However, 20% of children suffered from headaches upon waking, 13% experienced tooth or gum pain, and 10% had jaw pain (Figure 2). Regarding gadget use, parents identified both negative and positive effects. On the positive side, gadget use was associated with improved cognitive skills, enhanced motor skills, and increased enjoyment and entertainment for the child. Conversely, negative effects included hearing and vision problems, diminished attention spans, and lower academic performance (Figure 4).

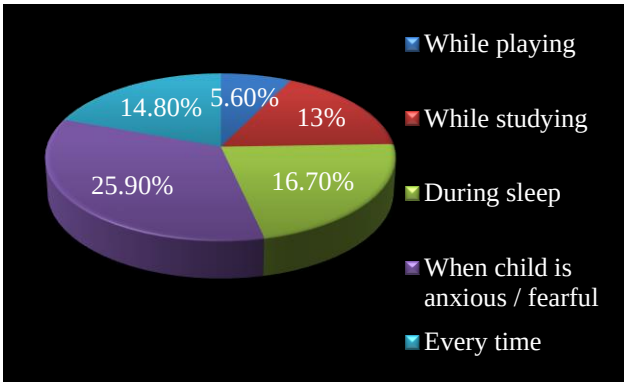

Figure 1: Most frequent time of teeth grinding of children.

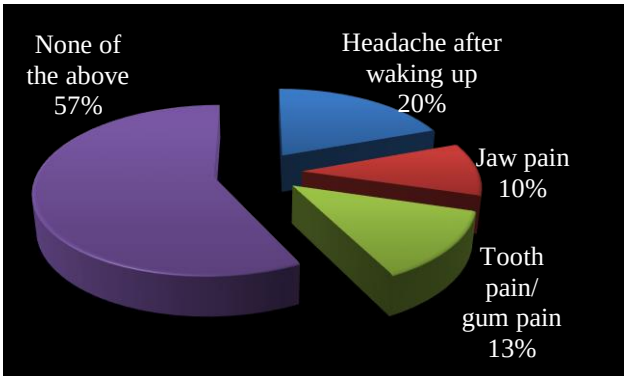

Figure 2: Most common symptom reported due to teeth grinding habit.

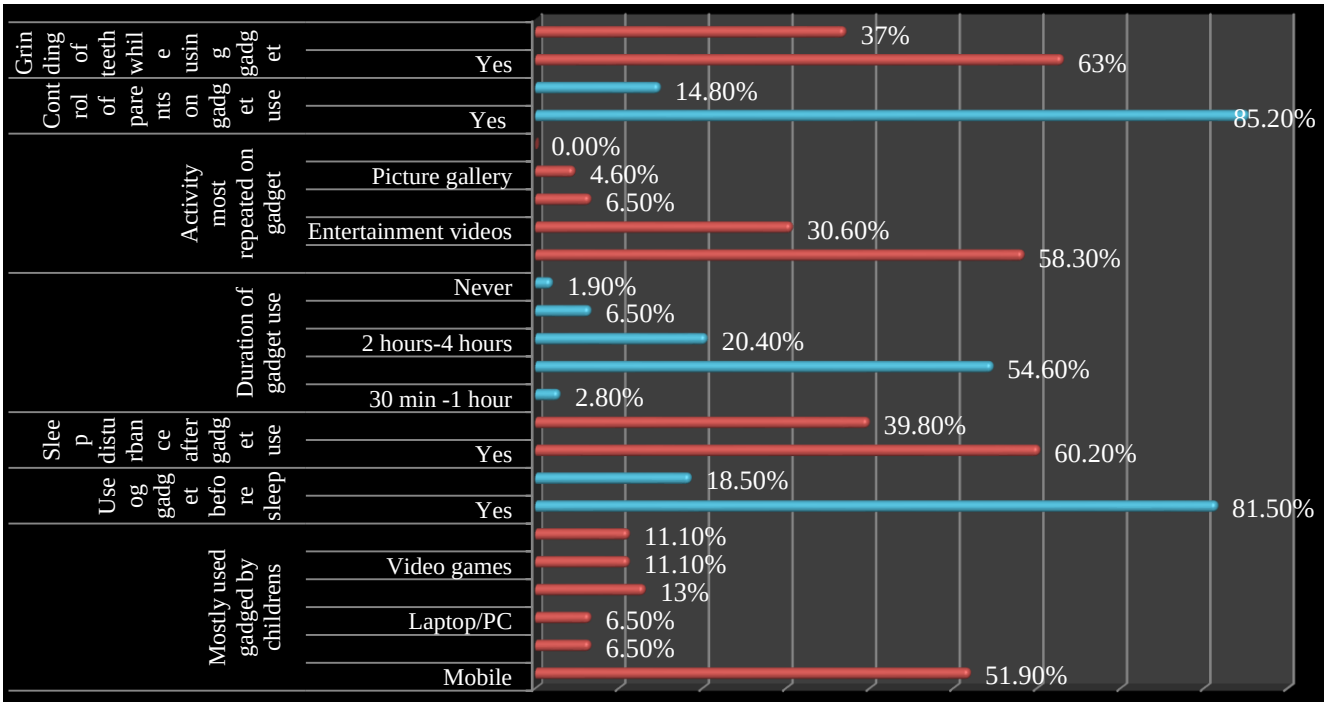

Figure 3: Assessment of knowledge and practice regarding use of gadget and teeth grinding habit of children.

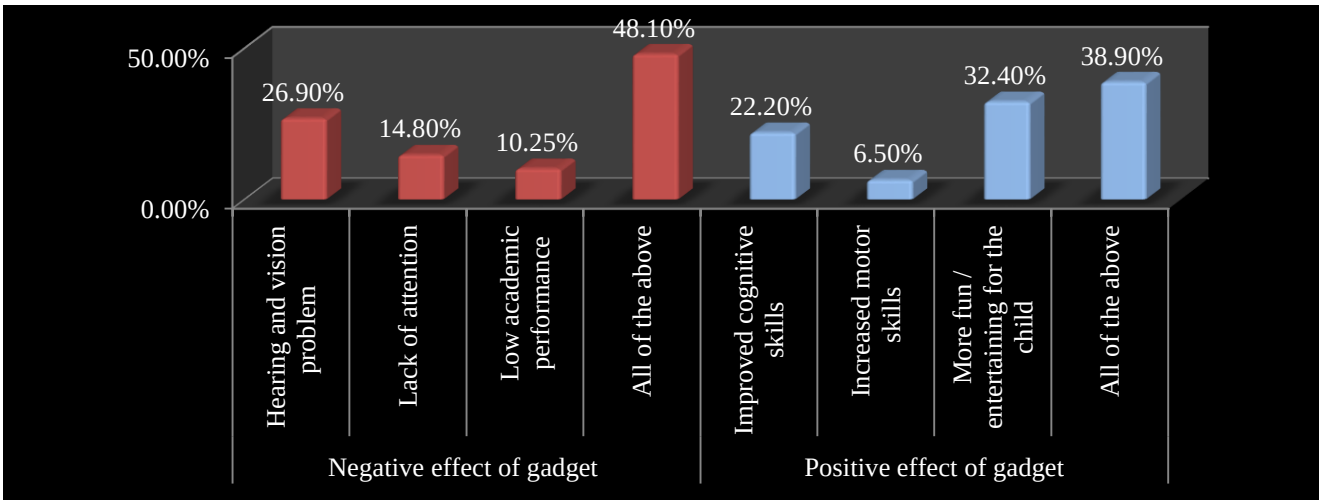

Figure 4: Negative and positive effects of use of gadget in children reported by parents.

In this study, 67.6% of parents concluded that teeth grinding, excessive gadget use, and disturbed sleep patterns in children are interrelated. Additionally, 57.4% of parents were aware of other harmful habits such as mouth breathing, lip biting, and thumb sucking in their children. Reflecting a proactive approach to these issues, 88% of parents expressed a preference for visiting a Paediatric Dentist to seek treatment for these harmful habits (Table 2).

DISCUSSION

Bruxism is a parafunctional habit that has been increasing among children in recent years and can persist from childhood into adulthood. Early diagnosis and treatment are crucial to prevent damage to teeth, the temporomandibular joint, and chewing muscles. Children with bruxism, particularly those with nocturnal bruxism, are often unaware of their habit.[13] Thus, obtaining information from family members becomes an effective strategy for early diagnosis.[14] In this study, we aimed to evaluate parents' knowledge and awareness of bruxism in their children.

The percentage of parents in our study who reported knowing what bruxism is 57.4% is notably lower than the 95% reported by Serra-Negra et al.[16] Additionally, the frequency of bruxism among children in our study (74.1%) is higher (Table 2) than the rates found in other studies using similar diagnostic criteria based on caregivers' reports. For instance, a study conducted at Boston Children's Hospital (USA) with 854 parents/caregivers found a frequency of bruxism in 38% children.[17] Similar results were found in a study involving 652 Brazilian children at the teaching clinic of the Federal University of Minas Gerais in Belo Horizonte reported a 35.3% frequency of bruxism.[16]

In our study, 74.1% of parents reported that their children slept peacefully. The majority of children (57.4%) slept for 8-10 hours, 27.8% for 6-7 hours, and 14.8% for 10-12 hours (Table 2). In our study, we observed an association between the type of sleep and bruxism, despite contrasting with the findings of Serra-Negra et al, they reported a significant association between agitated sleep and bruxism.[16] This discrepancy suggests variability in how sleep patterns may influence bruxism across different studies and populations. In a study conducted in São Paulo, Brazil, involving 937 children aged two to six, questionnaires were administered to parents/caregivers, and clinical examinations were performed on the children. This study found that children with agitated sleep were 2.4 times more likely to develop bruxism.[18] Similarly, a study conducted with 450 children at the pediatric dentistry clinic of the University of Santo Amaro found that bruxism was associated with both agitated sleep and anxiety.[19] According to the International Classification of Sleep Disorders (ICSD-3), bruxism is considered a sleep-related movement disorder associated with arousals during the night.[20]

In this study, 29.6% of parents reported a habit of grinding their teeth while working or resting. Similar findings were noted in a study involving Brazilian caregivers and children, where the presence of bruxism in parents showed a significant association with bruxism in their children. For instance, among 88 fathers with bruxism, 66 children also exhibited the habit, while among 104 mothers with bruxism, 86 children showed signs of bruxism. These results suggest a potential hereditary or familial link to this parafunctional habit. Indeed, research on genetic predisposition has indicated that parents who experienced bruxism as children may be more likely to have children who develop the condition as well. Understanding these familial patterns is crucial for both early detection and the development of effective intervention strategies for managing bruxism in children.[21]

Technology plays a crucial role for toddlers and adolescents. Communication technology facilitates the exchange of information between speakers and listeners. Previous research suggests that this technology is unsuitable for younger generations. Exposure to gadgets introduces visual stimulation that may diminish children's cognitive skills, which are typically nurtured through outdoor play and activities like drawing books.[15]

Using gadgets reduces the amount of time children spend interacting with their parents, impacting both the quantity and quality of time spent together. Our study highlighted a significant prevalence of excessive gadget use among children, with 81.5% using gadgets before sleep, and 60.2% experiencing sleep disturbances afterward Similarly, a study by Johnson et al, revealed 11.6% of children with sleeping issues also exhibit bruxism disorder.[22]

In our study, parents observed teeth grinding in 63% of children while they were using gadgets. The most commonly used gadget among children was mobile phones, with 51.9% reporting frequent use. This was followed by television (13%), electronic toys and video games (11.1%), and laptops/PCs and tablets (6.5%). According to parental reports, 54.6% of children used gadgets for 1-2 hours daily, 20.4% for 2-4 hours, 6.5% for more than 4 hours, and 1.9% never used any gadgets at all. These findings underscore the prevalence and varying durations of gadget use among children in our study.

The national survey conducted in the US reported that children on average spend 6 hours and 21 minutes daily using gadgets.[23] The media has a significant impact on the psychological and social development of children. Higher levels of non-homework screen time can lead to addictive behaviours in children, known as screen dependency disorders. Research indicates that these disorders can alter genetic expressions during stages of neurological development, resulting in functional changes in the developing brain.[24]

In our study, the most frequently performed activity on gadgets by children was playing video games (58.30%), followed by watching entertainment videos (30.60%) and educational videos (6.50%). Children who play online games often experience stress from the pressure to win and can feel depressed when they lose. The use of gadgets, which can lead to stress, anxiety, and mental health issues, can impact patients both dentally and non-dentally. Previous research has indicated that excessive gadget use may contribute to conditions such as schizophrenia, a rare disorder characterized by lack of interest and concentration in school, particularly noted in children who spend extended periods on gadgets.[25]

The masticatory muscles, which include the temporalis, medial pterygoid, lateral pterygoid, and masseter muscles, are involved in both functional and para-functional activities. These activities can include clenching or grinding of teeth, bracing, and gnashing. Studies have highlighted the prevalence of diurnal bruxism, which occurs during waking hours, and nocturnal bruxism, which is associated with sleep and characterized by clenching and grinding activities.[26] In our study, we observed that 16.70% of children exhibited bruxism during sleep, while 14.80% showed signs of bruxism occurring at any time. These findings highlight the varied manifestations of bruxism among children, emphasizing its relevance in both day and night time.

Stress affects individuals for various reasons. According to the International Labour Office, stress and mental illness are growing concerns in information technology workplaces.[27] Workers in these environments are particularly susceptible to stress, especially when they start working with computers. Prolonged computer use has been linked to decrease cognitive skills and impaired motor skills among individuals.

In our study, a similar trend was observed where 41.80% of parents reported negative effects such as hearing and vision problems, lack of attention, and low academic performance in their children due to gadget use. The connection between stress from gadgets and bruxism suggests a cause-effect relationship. Providing dental care for children with bruxism has become increasingly challenging due to these factor.

It's essential for parents and caregivers to know what bruxism is so they can recognize the habit and seek help from healthcare professionals. Without understanding this parafunctional behaviour, they might misunderstand it and seek ineffective treatments. Also, lacking this knowledge could lead to underestimating the condition's importance, which could have lasting consequences into adulthood. Therefore, awareness and education about bruxism are crucial for early detection and proper management.

A previous study has shown that patients with bruxism often experience heightened anxiety levels and somatization symptoms when seeking primary treatments.[28] Treatment options for bruxism include relaxation techniques, changes in sleep patterns, splint therapy, medications, and electrical stimulation. During the early stages of treatment, parents should observe their child's sleep patterns for four weeks. Occlusal splints are recommended for night time use to prevent wear on tooth surfaces. By biting on the splint rather than their teeth, patients can avoid tooth soreness and jaw pain upon waking. These strategies aim to reduce symptom and protect dental health in individuals with bruxism.

Present study provides baseline data about knowledge and awareness regarding bruxism and its correlation with sleep cycle and gadget use. This would be helpful in relating association of bruxism with sleep cycle and gadget use in their children. However, this study had some limitations. The survey results were subjective and could be influenced by memory biases. We also recommend future research to include knowledge and awareness of caregivers in addition to parents, along with clinical examinations and advanced techniques like electromyography or polysomnography for more accurate diagnosis. Additionally, parents of children diagnosed with bruxism should be given education and counselling regarding the habit.

CONCLUSION

Parents play a crucial role in diagnosing bruxism in their children by recognizing the sounds produced during teeth grinding. Increased parental knowledge and awareness of these symptoms would facilitate timely and appropriate treatment-seeking. According to this study, children who grind their teeth often experience sleep disturbances, and those who engage in teeth clenching are more likely to suffer from stress after prolonged use of electronics. The study also found that children use gadgets more frequently than adults, especially within the age range of 6 to 10 years old. According to this study, the majority of kids spend their time playing video games, which is followed by other activities like watching TV or doing schoolwork. To some extent, parents are aware of the negative impacts of their children using gadgets, yet very few of them enforce restrictions on their children's use of gadgets.

The study highlights that children's use of technology has indirect effects, including increased stress levels. Therefore, further research is needed to better understand the connections between bruxism, children's sleep patterns and their use of electronic devices.

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