





# Assessment of Comorbid Psychopathologies, Psychosocial Factors and Psychiatric Treatment Approach in Children and Adolescents with Sleep Bruxism

## Uyku Bruksizimli Çocuk ve Ergenlerde Komorbid Psikopatolojilerin, Psikososyal Faktörlerin ve Psikiyatrik Tedavi Yaklaşımının Değerlendirilmesi

Elif ABANOZ<sup>1</sup> , Ozlem SIRELI<sup>1</sup> , Ilknur UCUZ<sup>2</sup> , Ayla UZUN CICEK<sup>1</sup> 

<sup>1</sup>Department of Child and Adolescent Psychiatry, Cumhuriyet University Faculty of Medicine, Sivas, TÜRKİYE

<sup>2</sup>Department of Child and Adolescent Psychiatry, İnönü University Faculty of Medicine, Malatya, TÜRKİYE

### Abstract

**Background:** Previous studies have revealed a close relationship between a variety of psychopathologies and psychosocial factors, and bruxism. However, psychosocial factors and psychiatric difficulties in children and adolescents with bruxism have not been extensively studied. In the current study, we sought to examine the sociodemographic characteristics, psychosocial factors, and comorbid psychopathologies of children and adolescents with sleep bruxism.

**Materials and Methods:** The study included 67 children and adolescents between the ages of 4-17 who were diagnosed with sleep bruxism and followed up at two different Child and Adolescent Psychiatry outpatient clinics between 2018 and 2024. Data on behavioral and emotional characteristics and comorbid psychiatric disorders of these patients, and treatment approaches to bruxism were retrospectively investigated.

**Results:** Our results indicated that 41.8% of the sample had at least one comorbid psychiatric disorder, and 10.4% had sub-threshold psychiatric symptoms. The most common comorbid psychiatric disorders were anxiety disorders, attention deficit hyperactivity disorder, nocturnal enuresis, and conduct disorders. In 41.8% of cases, bruxism was linked to psychosocial factors. Comorbid psychiatric disorders were significantly more prevalent in the school and adolescent age groups than in preschoolers. Similarly, the connection between bruxism and psychosocial factors became more evident with age. The frequency of a positive family history of bruxism was 44.8%. As treatment options for bruxism, the behavioral approach and pharmacotherapy were preferred in 88.1% of cases, and only the behavioral approach was applied to 11.9%. The most common drugs used in pharmacotherapy were hydroxyzine, tricyclic antidepressants, antipsychotics, atypical antidepressants, and melatonin. In terms of response to treatment, 83.6% of the sample responded (completely or partially), while 16.4% did not respond or were resistant to treatment.

**Conclusions:** This study yielded that psychiatric comorbidity is quite common in the pediatric population with sleep bruxism. The outcomes suggest that bruxism is not only a dental problem but is also associated with a variety of psychopathologies and psychosocial factors. Therefore, health professionals who may encounter bruxism should be aware of the relationship between bruxism and psychopathologies and psychosocial factors. It is recommended that children with bruxism be investigated carefully in a multidisciplinary and holistic approach from a bio-psycho-social perspective and screened for psychosocial and psychiatric difficulties.

**Key Words:** Sleep bruxism, Child and adolescent, Anxiety, Psychopathology, Treatment

### Öz

**Amaç:** Önceki araştırmalar çeşitli psikopatolojiler ve psikososyal faktörler ile bruksizm arasında yakın bir ilişki olduğunu ortaya koymuştur. Bununla birlikte, bruksizimli çocuk ve ergenlerde psikososyal faktörler ve psikiyatrik zorluklar yeterince araştırılmamıştır. Bu çalışmada uyku bruksizimli çocuk ve ergenlerin sosyodemografik özelliklerini, psikososyal faktörlerini ve komorbid psikopatolojilerini araştırmayı amaçladık.

**Materyal ve Metod:** Çalışmaya 2018-2024 yılları arasında iki farklı Çocuk ve Ergen Psikiyatrisi polikliniğinde uyku bruksizmi tanısı konulan ve takip edilen 4-17 yaş arası 67 çocuk ve ergen dahil edildi. Bu hastaların davranışsal ve duygusal özellikleri, komorbid psikiyatrik bozuklukları ve bruksizme yönelik tedavi yaklaşımlarına ilişkin veriler retrospektif olarak incelendi.

**Bulgular:** Sonuçlarımız örneklemin %41.8'inde en az bir psikiyatrik bozukluk ve %10,4'ünün eşik altı psikiyatrik belirtiler olduğunu gösterdi. En sık komorbid psikiyatrik bozukluklar anksiyete bozuklukları, dikkat eksikliği hiperaktivite bozukluğu, nokturnal enürezisi ve davranım bozukluklarıydı. Olguların %41.8'inde bruksizm psikososyal faktörlerle bağlantılıydı. Eşlik eden psikiyatrik bozukluklar okul ve ergen yaş gruplarında okul öncesi çocuklara göre anlamlı derecede daha yaygındı. Benzer şekilde, bruksizm ile psikososyal faktörler arasındaki bağlantı yaş ilerledikçe daha da belirginleşti. Ailede pozitif bruksizm öyküsü %44.8 idi. Bruksizme tedavi seçeneği olarak, olguların %88.1'inde davranışsal yaklaşım ve farmakoterapi tercih edilirken, %11.9'una yalnızca davranışsal yaklaşım uygulandı. Farmakoterapide en sık kullanılan ilaçlar hidrokizin, trisiklik antidepresanlar, antipsikotikler, atipik antidepresanlar ve melatonindi. Tedaviye yanıt açısından örneklemin %83.6'sı (tam veya kısmi) yanıt verirken, %16.4'ü yanıt vermedi veya tedaviye dirençliydi.

**Sonuç:** Bu çalışma uyku bruksizimli pediatrik popülasyonda psikiyatrik komorbiditenin oldukça yaygın olduğunu ortaya koymuştur. Sonuçlar bruksizmin sadece dental bir problem olmadığını, aynı zamanda çeşitli psikopatolojiler ve psikososyal faktörlerle de ilişkili olduğunu göstermektedir. Bu nedenle bruksizmle karşılaşabilecek sağlık profesyonellerinin bruksizm ile psikopatolojiler ve psikososyal faktörler arasındaki ilişkinin farkında olması gerekmektedir. Bruksizimli çocukların biyo-psyko-sosyal perspektiften multidisipliner ve bütüncül bir yaklaşımla dikkatle incelenmesi ve psikososyal ve psikiyatrik zorluklar açısından taranması önerilmektedir.

**Anahtar Kelimeler:** Uyku bruksizmi, Çocuk ve ergen, Anksiyete, Psikopatoloji, Tedavi

### Corresponding Author / Sorumlu Yazar

Dr. Elif ABANOZ

Department of Child and Adolescent Psychiatry, Faculty of Medicine, Cumhuriyet University, Yenisehir, Kayseri St, No:43, Zip Code: 58140. Sivas, TÜRKİYE

E-mail: elifabanoz\_17@hotmail.com

Received / Geliş tarihi: 13.05.2024

Accepted / Kabul tarihi: 04.07.2024

DOI: 10.35440/hutfd.1483139

## Introduction

Excessive teeth grinding or jaw clenching is called bruxism, a parafunctional habit of the chewing muscles, and based on the circadian cycle, bruxism is classified into two groups: sleep (nocturnal) bruxism and awake (diurnal) bruxism (1,2). Sleep bruxism is more common and is known to be associated with both physical and/or emotional stress (1-3). The prevalence of bruxism in children ranges from 3.5% to 40.62% and its incidence decreases with age (3). The average age of onset in children is between 4 and 8 years old, with bruxism most prevalent between the ages of 5-7 (3-5). While some studies on bruxism do not report a gender difference, some studies show that girls are more prone to bruxism, and others indicate that boys are more likely to experience bruxism (3-5).

The etiology of sleep bruxism, which is considered a sleep-related movement disorder, is not fully known and it is suggested that it is a multifactorial disease including morphological, pathophysiological, and psychosocial factors (3,6,7). Bruxism has been linked to several causes, including genetic factors (the family history of bruxism), male gender, sleep disorders, gastroesophageal reflux, object biting, secondhand smoke exposure, headaches, peer relationship problems and peer pressure, and emotional stress and other mental health issues (6-8). Psychological and personality traits such as anxiety, stress, depression, disappointment, aggression, or emotional suppression are thought to be associated with bruxism (7-10). In a study of the relationship between social, emotional, and behavioral problems and bruxism in school-aged children, it was determined that social, emotional, and behavioral difficulties and peer relationship problems were all strongly associated with sleep bruxism (11). It has demonstrated that the most common emotional factor in children with bruxism is stress from constant restlessness and worry (6) and that those who experience significant amounts of stress are more prone than healthy people to develop bruxism (12). Similarly, other studies have emphasized that high stress and responsibility levels are the main causes of the occurrence of childhood sleep bruxism (13). Again, it has been determined that in comparison to controls, children with bruxism have a greater rate of psychiatric comorbidities and higher severity levels of anxiety and depression (14-16). Therefore, it is emphasized that children with bruxism should be evaluated for medical diseases such as sleep-related breathing problems and gastroesophageal reflux, as well as psychiatric conditions such as anxiety and depression, insomnia, attention deficit hyperactivity disorder (ADHD), and irritability (6,8-16). Furthermore, a relationship between the psychiatric symptoms of parents and sleep bruxism in their children is also underlined (14,16). A recent study looking at the relationship between parents' psychiatric symptoms and their child's sleep bruxism revealed that the child's bruxism is related to the parents' psychiatric issues, particularly anxiety and stress (14).

In another study, the anxiety levels of children with sleep bruxism and their mothers were found to be high (16).

According to a review of the literature, most research is focused on adults, with very few examining psychiatric conditions related to bruxism in children in Turkey (5,14-18). However, bruxism is an important disorder that affects the quality of life, although its consequences are not life-threatening, and considering its high incidence in the child population, it is thought that it is crucial to identify bruxism and related factors. Thus, this study aimed to examine the sociodemographic characteristics, psychosocial factors, and accompanying psychopathologies of children and adolescents diagnosed with sleep bruxism and referred to the child and adolescent psychiatry clinic for psychosocial evaluation. The main hypothesis of our study is that sleep bruxism would be associated with some psychiatric symptoms and behavioral and emotional difficulties in children.

## Materials and Methods

### Participants

Sixty-seven children and adolescents between the ages of 4-17 who were referred to two different Child and Adolescent Psychiatry outpatient clinics due to teeth grinding (bruxism) between 2018 and 2024 participated in this study. The study only included participants with idiopathic bruxism and sleep bruxism. Sleep bruxism was explored using diagnostic criteria developed by the American Academy of Sleep Medicine (19) and parents' reports. Before psychiatric admission, all participants had been examined by a dentist, general pediatrician, and otolaryngologist. Patients with iatrogenic bruxism or secondary bruxism (bruxism caused by neurological, psychiatric, sleep disorders, and medication-related conditions) were excluded from the study. Also, we did not include in the study those with intellectual disability, autism spectrum disorder, psychotic disorder, medication for any psychiatric condition, epilepsy, and a history of major head trauma. Data on sociodemographic characteristics of participants, psychiatric disorders, sleep-related movement disorders and parasomnias of children and their families, and treatment approaches to bruxism, and behavioral and emotional characteristics of children were retrospectively investigated. Initially, 75 patients were included in the study, but 8 patients were not included in the study because their data entry was incomplete. Comorbid psychiatric conditions were diagnosed by a standard psychiatric interview using The Diagnostic and Statistical Manual of Mental Disorders Fifth Edition's (DSM-5) criteria (American Psychiatric Association 2013) (20). The approval for the study protocol was obtained from the local institutional Ethics Committee (Date/No: 2024/5687), and all procedures were conducted according to the principles of the Declaration of Helsinki on biomedical research involving human patients and Good Clinical Practice procedures.

### Statistical Analysis

All statistical analyses were performed using SPSS 26.0 software. The numerical and categorical data were given as mean  $\pm$  standard deviation (SD), number (n), median (min-max), and percentage (%) as appropriate. Descriptive statistics were used to summarize variables. The chi-square ( $\chi^2$ ) test for categorical variables was used to test group differences. For all analyses,  $p < 0.05$  was considered statistically significant.

## Results

### Sociodemographic characteristics of the sample

The study included 36 (53.7%) female participants and 31 (46.3%) male participants, with a mean age of  $7.36 \pm 2.96$  years. Participants were divided into three age groups: preschool group (n=31, 46.3%), school-aged group (n=29, 44.3%), and adolescent group (n=7, 10.4%). The sociodemographic characteristics of the sample are displayed in Table 1.

**Table 1.** Sociodemographic characteristics of the sample

Variables	Number (%) or mean $\pm$ SD
Age (mean-years $\pm$ SD)	7.36 $\pm$ 2.96
Age groups	
Preschool group	31 (46.3)
School-age group	29 (44.3)
Adolescent group	7 (10.4)
Sex	
Male	31 (46.3)
Female	36 (53.7)
Level of education of the mother	
Primary education and lower	7 (10.4)
Upper primary education	60 (89.6)
Regular job of the mother	
Yes	28 (41.8)
No	39 (58.2)
Level of education of the father	
Primary education and lower	4 (6.0)
Upper primary education	63 (94.0)
Regular job of the father	
Yes	59 (88.1)
No	8 (11.9)
Family income level	
The minimum wage/less than minimum wage	26 (38.8)
Above the minimum wage	41 (61.2)
Family type	
Nuclear	51 (76.1)
Single-parent	10 (14.9)
Extended	6 (9.0)

\*Descriptive statistics were used.

### Psychiatric disorders, sleep-related movement disorders, and parasomnias in children and their family members

In our sample, 32 patients (47.8%) had no co-occurring psychiatric problems, 14 patients (20.9%) had one co-occurring psychiatric disorder, and 14 patients (20.9%) had two or

more co-occurring psychiatric disorders. Subthreshold psychiatric symptoms were seen in 7 (10.4%) patients, and all of them were subthreshold anxiety symptoms. Any anxiety disorder (n=13, 19.4%), ADHD (n=12, 17.9%), nocturnal enuresis (n=10, 14.9%), oppositional defiant disorder (ODD)/conduct disorder (CD) (n=8, 11.9%), post-traumatic stress disorder (n=2, 3.0%), and major depressive disorder (n=1, 1.5%), respectively were the most often occurring comorbid psychiatric conditions. Also, 2 patients (3.0%) experienced other sleep-related movement disorders (both were restless legs syndrome) and 13 patients (19.4%) suffered from parasomnias.

Ten mothers (14.9%) had psychiatric disorders (except for sleep disorders), 12 (17.9%) had any sleep-related movement disorders (including bruxism), 8 (11.9%) had bruxism, and 20 (29.9%) experienced any parasomnia. As for fathers, 8 (11.9%) had psychiatric disorders (except for sleep disorders), 25 (37.3%) had sleep-related movement disorders (including bruxism), 18 (26.9%) had bruxism, and 28 (41.8%) had any parasomnia. When all first-degree family members are taken into account, the frequency of sleep-related movement disorders (including bruxism) was 52.2% (n=35), the frequency of bruxism was 44.8% (n=30) and the frequency of parasomnia was 56.7% (n=38).

Data on psychiatric disorders, sleep-related movement disorders, and parasomnias in children and their family members are given in Table 2.

### Clinical features of bruxism and treatment approaches to bruxism

The average age of onset of bruxism was  $5.14 \pm 1.56$  years. Eighteen (26.9%) patients had substantial tooth wear or loss due to bruxism. Cases with tooth wear or loss were identified through interviews with patients and their families by an expert child and adolescent psychiatrist. The relationship between bruxism and psychosocial factors (such as stress, frustration, anxiety, social and family relationship problems or duty-related anxiety) was reported in 28 patients (41.8%). While the behavioral approach + pharmacotherapy was preferred as treatment in 59 (88.1%) patients, only the behavioral strategy was applied to 8 (11.9%). In the following order of frequency of usage, the agents utilized in psychopharmacotherapy: hydroxyzine (alone or as an adjunct to other medications) (n=27, %40.3), tricyclic antidepressants (TCAs) (n=19, %28.4), antipsychotics (in addition to other medications) (n=10, 14.9), atypical antidepressants (mirtazapine, only n=8, %11.9), melatonin (in addition to other medications) (n=6, %9.0). In terms of how well patients responded to treatment, 20 patients (29.9%) showed a complete response, 36 patients (53.7%) showed a partial response to treatment, and 11 patients (16.4%) were unresponsive/resistant to treatment. The results are shown in Table 3.

**Table 2.** Evaluation of children and their families in terms of psychiatric disorders, sleep-related movement disorders, and parasomnias

Variables	Number (%)
Current comorbid psychopathology in the children	
No	32 (47.8)
Subthreshold psychiatric symptoms*	7 (10.4)
Only one comorbid psychiatric disorder	14 (20.9)
At least two comorbid psychiatric disorders	14 (20.9)
Concomitant psychiatric disorder(s) in the children (alone or together)	
Any anxiety disorder	13 (19.4)
ADHD	12 (17.9)
Nocturnal Enuresis	10 (14.9)
CD/ODD	8 (11.9)
PTSD	2 (3.0)
MDD	1 (1.5)
The presence of other sleep-related movement disorders in the children**	2 (3.0)
The presence of parasomnia(s) in the children	13 (19.4)
The presence of psychiatric disorder in the mother (except for sleep disorders)	10 (14.9)
The presence of sleep-related movement disorders in the mother (including bruxism)	12 (17.9)
The presence of bruxism in the mother	8 (11.9)
The presence of parasomnia(s) in the mother	20 (29.9)
The presence of psychiatric disorder in the father (except for sleep disorders)	8 (11.9)
The presence of sleep-related movement disorders in the father (including bruxism)	25 (37.3)
The presence of bruxism in the father	18 (26.9)
The presence of parasomnia(s) in the father	28 (41.8)
The presence of sleep-related movement disorders in all family members (including bruxism)	35 (52.2)
The presence of bruxism in all family members	30 (44.8)
The presence of parasomnia(s) in all family members	38 (56.7)

**Abbreviations:** ADHD: Attention deficit hyperactivity disorder; CD: Conduct disorder, MDD: Major depressive disorder; ODD: Oppositional defiant disorder; PTSD: Post-traumatic stress disorder. \*All subthreshold psychiatric symptoms were symptoms of subthreshold anxiety. \*\*The other sleep-related movement disorders in children were both restless legs syndrome. \*\*\*Descriptive statistics were used.

**Table 3.** Clinical features of bruxism

Variables	Number (%) or mean±SD
Age of first occurrence of bruxism (mean-years±SD)	5.14±1.56
The presence of substantial tooth wear or loss	18 (26.9)
An association between bruxism and psychosocial factors	28 (41.8)
Current treatment approach for bruxism	
Behavioral approach, only	8 (11.9)
Behavioral approach + Pharmacotherapy	59 (88.1)
Currently prescribed medications for bruxism	
Hydroxyzine (alone or as an adjunct to other medications)	27 (40.3)
Tricyclic antidepressants (TCAs)	19 (28.4)
Antipsychotics (in addition to other medications)	10 (14.9)
Atypical Antidepressants (Mirtazapine, only)	8 (11.9)
Melatonin (in addition to other medications)	6 (9.0)
Response to current treatment	
Complete response	20 (29.9)
Partial response	36 (53.7)
No response (resistance to treatment)	11 (16.4)

\*Descriptive statistics were used.

### Behavioral and emotional characteristics of children with bruxism

Also, the behavioral and emotional characteristics of patients with bruxism were evaluated based on parent reports, self-report, and clinical observation. Accordingly, among children with bruxism, 14 (20.9%) of children exhibited significant hyperactivity, 22 (32.8%) showed attention deficits, 14 (20.9%) exhibited irritability, 14 (20.9%) displayed aggression and quarrelsomeness, and 14 (20.9%) exhibited disobedience and defiance of rules.

Furthermore, among children with bruxism, marked restlessness was found at a frequency of 38.8% (n=26), sadness and unhappiness were at a frequency of 9% (n=6), worries,

anxiety, and fears were at a frequency of 28.4% (n=19), and somatic complaints were at a frequency of 11.9% (n=8). The behavioral and emotional characteristics of children with bruxism are presented in Table 4.

### Comparison of clinical features of bruxism and comorbid conditions between age groups

When psychiatric disorder comorbidity frequencies were compared across age groups, children with bruxism had comorbid psychiatric conditions that increased with age. Patients in the adolescent-age and school-age groups had significantly higher psychiatric disorder comorbidity rates than those in the preschool-age group (p<0.001). Again, there was a significant increase in the frequency of a link

between bruxism and psychosocial factors with age ( $p < 0.001$ ). Accordingly, while the relationship between bruxism and psychosocial factors was 100% in adolescents, it was 55.2% in school-age children and 16.1% in preschool-age children. However, there were no significant differ-

ences in the frequency of sleep-related movement disorders, bruxism, and parasomnia among first-degree family members according to age groups (all  $p$ -values  $> 0.05$ ). The results are seen in Table 5.

**Table 4.** Behavioral and emotional characteristics of children with bruxism

Variables	Number (%) or mean $\pm$ SD
Hyperactivity in the child	
Rarely	29 (43.3)
Sometimes	24 (35.8)
Usually	14 (20.9)
Inattention in the children	
Rarely	12 (17.9)
Sometimes	33 (49.3)
Usually	22 (32.8)
Irritability in the child	
Rarely	29 (43.3)
Sometimes	24 (35.8)
Usually	14 (20.9)
Aggression and quarrelsomeness in the child	
Rarely	49 (73.1)
Sometimes	4 (6.0)
Usually	14 (20.9)
Disobedience and defiance of rules in the child	
Rarely	37 (55.2)
Sometimes	16 (23.9)
Usually	14 (20.9)
Restlessness in the child	
Rarely	25 (37.3)
Sometimes	16 (23.9)
Usually	26 (38.8)
Sadness and unhappiness in the child	
Rarely	39 (58.2)
Sometimes	22 (32.8)
Usually	6 (9.0)
Worries, anxiety, and fears in the child	
Rarely	35 (52.2)
Sometimes	13 (19.4)
Usually	19 (28.4)
Somatic complaints in children	
Rarely	42 (62.7)
Sometimes	17 (25.4)
Usually	8 (11.9)

Descriptive statistics were used

**Table 5.** Comparison of clinical features of bruxism and comorbid conditions between age groups

	Preschool group (n=31)	School age (n=29)	Adolescent group (n=7)	p-value*
Current comorbid psychopathology in the child (n,%)				
Yes	5 (16.1)	18 (62.1)	5 (71.4)	
Subthreshold psychiatric symptoms	1 (3.3)	5 (17.2)	1 (14.3)	
No	25 (80.6)	6 (20.7)	1 (14.3)	<b>&lt;0.001</b>
An association between bruxism and psychosocial factors (n,%)				
Yes	5 (16.1)	16 (55.2)	7 (100)	
No	26 (83.9)	13 (44.8)	0 (0)	<b>&lt;0.001</b>
The presence of sleep-related movement disorders in all family members (including bruxism) (n,%)				
Yes	17 (54.8)	15 (51.7)	3 (42.9)	
No	14 (45.2)	14 (48.3)	4 (57.1)	0.846
The presence of bruxism in all family members				
Yes	13 (41.9)	14 (48.3)	3 (42.9)	
No	18 (58.1)	15 (51.7)	4 (57.1)	0.880
The presence of parasomnia(s) in all family members				
Yes	16 (51.6)	17 (58.6)	5 (71.4)	
No	15 (48.4)	12 (41.4)	2 (28.6)	0.610



## Discussion

In this study, psychiatric conditions and psychosocial factors were investigated in children and adolescents with sleep bruxism who were referred to the child psychiatry clinic for psychosocial evaluation, and noteworthy findings were achieved.

Firstly, our results revealed that a sizable portion of sample had at least one comorbid psychiatric disorder, and a lesser percentage had subthreshold psychiatric symptoms (all were symptoms of subthreshold anxiety). The most common psychiatric disorders were any type of anxiety disorder, ADHD, nocturnal enuresis, and ODD/CD, respectively. Also, around 20% of these children had additional sleep disorders such as parasomnia and other sleep-related movement disorders. Consistent with our findings, previous studies have demonstrated that children with sleep bruxism frequently exhibit psychiatric symptoms and disorders, including anxiety, stress, sleep disorders, ADHD, enuresis, and conduct disorder (12-16). More specifically, it has been reported that bruxism and separation anxiety disorder in children are closely related (14). Another recent study found that children with bruxism also had higher scores for separation anxiety, social anxiety, and school fear in addition to their overall anxiety score (16). Since this study did not categorize anxiety disorders, we could not produce any data regarding which type of anxiety disorder would be more common in children with bruxism. Numerous previous studies have also documented a connection between bruxism and ADHD in children, and it was observed that the prevalence of sleep bruxism increased in children with ADHD compared to controls (21,22). Another study revealed a strong positive correlation between bruxism and ODD and ADHD (23). It has also been reported that children with conduct disorder are more likely to experience bruxism and sleep disturbances, and this condition is linked to stress (24). As for the relationship between nocturnal enuresis and sleep bruxism, it has been highlighted that nocturnal enuresis is more prevalent in children with sleep bruxism and that nocturnal enuresis, which can cause emotional stress and lack of self-confidence, is a factor that predicts sleep bruxism in children (25,26). In conclusion, the majority of studies suggest that children with bruxism experience more psychiatric symptoms and disorders, and that especially stress and anxiety trigger bruxism.

An important finding of this study was that the frequency of comorbid psychiatric disorders was significantly higher in the school and adolescent age groups than in the preschool-age group. Also, we determined that the link between bruxism and psychosocial factors becomes more evident with age. A reasonable explanation for the increase in the frequency of comorbid psychiatric disorders accompanying bruxism with age could be that children and adolescents experience physical and social change more rapidly as they age, and young people, particularly as they enter adolescence, face a variety of mental health issues. Among school-

age children and in particular adolescents, the most common problems and concerns in the psychological field are managing emotions, establishing relationships, strengthening social skills, and dealing with peer pressure (27). Therefore, given the tendency of bruxism to coexist with many psychiatric diseases such as anxiety disorder, ADHD, behavioral problems, and depression, we can conclude that an increase in the comorbidity of psychiatric disorders accompanying bruxism in school-age and in particular adolescents is an expected situation. Nevertheless, more studies are needed to examine the clinical features of bruxism and comorbid psychiatric disorders according to age.

This study also looked into the behavioral and emotional characteristics of children with bruxism. At least 20% of the sample reported psychiatric symptoms such as restlessness, attention deficit hyperactivity, worries, anxiety, and fears, irritability, aggression, quarrelsomeness, and rule-breaking. Existing research on this topic supports our findings that anxiety, stress, restlessness and worry, aggression, attention and behavioral problems, and oppositional behavior predict bruxism; that children's behaviors influence the development of bruxism; and that children with aggressive, anxious, shy, and nervous personality traits are more likely to develop bruxism (6, 11-16, 21-24, 28-30). For example, in a study of the relationship between stress, personality traits, and sleep bruxism in children, it was discovered that children with high stress levels and a sense of responsibility are twice as likely to develop sleep bruxism (13). Also, in a study of the relationship between social, emotional, and behavioral problems and bruxism in school-aged children, it was determined that social, emotional, and behavioral difficulties, emotional symptoms, and peer relationship problems were all significantly associated with sleep bruxism (11). However, it has been demonstrated that sleep bruxism has no relationship with psychosocial factors in children under the age of five, but only with psychological factors in children over the age of six (28). In our study, the relationship between bruxism and psychosocial factors (such as stress, frustration, anxiety, social and family relationship problems or duty-related anxiety) was reported in 41.8% of the cases, and as in previous studies, the relationship between bruxism and psychosocial factors became significantly more pronounced with age. As a result, when the existing literature and our findings are combined, we can conclude that restlessness, worry, anxiety, stress, and psychosocial factors play a role in the development of sleep bruxism in children.

In addition, it is well known that children with sleep bruxism while sleeping frequently experience sleep disorders, and parasomnias and restless legs syndrome are particularly common (25,29,31-33). In this study, it was discovered that parasomnias and other sleep-related movement disorders were co-occurring in 19.4% and 3% of the sample, respectively, and other sleep-related movement disorders consisted only of restless legs syndrome. Similar to our finding,

in their research of 500 children with sleep bruxism between the ages of 6-12, Us et al. found that a sizable percentage of children with bruxism also had parasomnias (32). While our results seem in line with previous research, more long-term investigations into the connection between bruxism and other sleep problems are obviously required to better understand our findings.

In this study, the frequency of a positive family history of bruxism was 44.8%. Additionally, the frequency of a positive family history of sleep-related movement disorders was 52.2% and the frequency of a positive family history of parasomnia was 56.7%. Previous studies have revealed that the frequency of teeth clenching or grinding habits in any family member of children with bruxism is higher than in children without bruxism, and the presence of sleep bruxism in other members of the family is the most important genetic risk factor for bruxism (14,32,33). Researchers have claimed that the presence of bruxism in parents and the parent's psychiatric symptoms may be potentially related factors to the emergence of sleep bruxism in their children (14). A recent study reported that 47.8% of family members of children with sleep bruxism had a history of bruxism, compared to 16.7% in the control group (32). Another study documented that 71% of parents of children with sleep bruxism suffer from the condition themselves (33). The different results associated with the presence of a positive history of sleep bruxism in family members of children with bruxism could be attributed to heterogeneity in study settings and methodological differences.

Furthermore, numerous studies have demonstrated that parents' anxiety, depression levels, and psychiatric symptom profiles affect the occurrence of sleep bruxism in their children (14,16,34). The majority of studies investigating the relationship between parental psychopathology and bruxism in children discovered a link between depression, anxiety symptoms, and stressful events in parents and bruxism in children (14,16,34). Our study yielded that 14.9% of mothers and 11.9% of fathers had a psychiatric disorder. However, because we did not categorize the psychopathologies in the parents, we were unable to draw any conclusions about which types of psychiatric conditions are more common in the parents of children with bruxism. Existing evidence and our findings suggest that in clinical approaches and therapy practices for children with bruxism, the psychopathology of the parents of these children should also be considered.

Regarding the sociodemographic characteristics of children with bruxism in this study, it was observed that the majority of bruxism patients were preschoolers and the average age was  $7.36 \pm 2.96$  years, with a mean age of onset of  $5.14 \pm 1.56$  years. Consistent with our findings, previous studies have shown that bruxism emerges most frequently in children aged 4 to 8, is most frequently seen between the ages of 5-7 and its incidence decreases with advancing age (3-5). Again, in this study, although the difference was not very

evident, the female gender was more prevalent in our sample, and the majority of parents had relatively high education levels and family income levels. On the other hand, previous studies have produced findings that male gender, low parental education level, and low family income are risk factors for bruxism (8,32). Conflicting results may be due to factors related to the methodology of the studies, such as the source of cases, sample size, criteria used for bruxism, highly variable exclusionary criteria, and age group included, and factors that influence the actual risk of bruxism, such as gender or sociodemographic status.

Finally, as a treatment approach for bruxism, this study found that both the behavioral approach and pharmacotherapy were preferred in 88.1% of cases, and only the behavioral approach was applied in 11.9%. The most common drugs used in pharmacotherapy were hydroxyzine, tricyclic antidepressants, antipsychotics, atypical antidepressants, and melatonin. In terms of response to treatment, 83.6% of the sample responded (completely or partially), while 16.4% did not respond or were resistant to treatment. Since bruxism has a multifactorial etiology and is associated with a wide range of psychosocial and medical variables, different treatment options are available, and treatment practices differ depending on detectable etiological factors and accompanying medical and psychological conditions. The treatment includes drugs such as hydroxyzine and trazodone, medicinal extracts of *Melissa officinalis*-L, occlusal appliances, orthodontic treatments, psychiatric approaches, and physical therapy (6,17,35-37). In psychiatric approaches, personalized cognitive and behavioral therapies and drug treatments are applied to improve sleep hygiene and quality, manage stress, anxiety, and other psychiatric symptoms, change unwanted habits, and raise awareness (6,17,35-37). Several studies have indicated that the use of drugs in various groups is increasing in the pharmacological treatment of bruxism, and among psychiatric and other medical drugs, hydroxyzine, tricyclic antidepressants, other antidepressants, benzodiazepines, anticonvulsants, beta-blockers, and dopamine agents are commonly used and effective (6,17,35-37). However, it is underlined that evidence-based data on the treatment of bruxism in children is quite sparse and that appropriately designed drug studies with large sample sizes are required (36).

This study is one of the few studies to look at the psychosocial characteristics and psychiatric comorbidities of childhood sleep bruxism. Using strict exclusion criteria, the clinical characteristics, familial characteristics, and treatment approaches of preschool, school-age, and adolescent sleep bruxism cases were also thoroughly examined in the study, and notable results that expanded the literature data were obtained. Despite the significant findings, this study also has some limitations. Our study's limitations include a small sample size, wide age range (4-17 years), no control group, clinic-recruited sample, no scale to assess children's behavioral and emotional characteristics, and a retrospective design. These weaknesses make it difficult to generalize our

findings. Therefore, future prospective studies with large samples and a control group will be extremely valuable in the future.

## Conclusion

In conclusion, this study provides comprehensive information about the clinical features of bruxism and treatment approaches for bruxism, the behavioral and emotional characteristics and psychopathologies of children with bruxism, and the psychosocial and familial factors in bruxism. The findings of the present study add evidence to the existing literature by revealing that psychosocial and emotional factors and psychopathology, including sleep disorders, are quite common in children and adolescents with sleep bruxism, and support the argument that behavioral and emotional problems may be risk factors for bruxism in childhood. Our finding that there is a very high rate of positive family history of sleep-related movement disorders (including bruxism) also strengthens the results of studies emphasizing the genetic aspect of bruxism. These outcomes suggest that bruxism is not only a dental problem but is also associated with a variety of psychopathologies and psychosocial factors. Therefore, dentists, pediatricians, family physicians, child psychiatrists, and other health professionals who may encounter bruxism should be aware of the link between bruxism and psychopathologies and psychosocial factors. This awareness would help in the early detection and intervention of mental health issues that may accompany and thus improve the quality of life and potentially prevent or attenuate long-term damage. From this point of view, it is recommended that children with bruxism be investigated carefully in a multidisciplinary and holistic approach from a bio-psycho-social perspective and screened for psychosocial and psychiatric difficulties.

## Acknowledgments

The authors would like to thank all the adolescents and their families who participated in this study.

---

**Ethical Approval:** This study was approved by the local Ethics Committee of the Medical Faculty of İnönü University (2024/5687)

---

### Author Contributions:

Concept: E.A., Ö.Ş., İ.U., A.U.Ç.

Literature Review: E.A., Ö.Ş.

Design : İ.U., A.U.Ç.

Data acquisition: E.A., Ö.Ş., İ.U., A.U.Ç.

Analysis and interpretation: İ.U., A.U.Ç.

Writing manuscript: E.A., Ö.Ş.

Critical revision of manuscript: : İ.U., A.U.Ç.

**Conflict of Interest:** The authors have no conflicts of interest to declare.

**Financial Disclosure:** This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

---

## References

1. Lobbezoo F, Ahlberg J, Glaros AG, Kato T, Koyano K, Lavigne GJ, et al. Bruxism defined and graded: an international consensus. *J Oral Rehabil.* 2013;40(1):2-4. doi: 10.1111/joor.12011.
2. Lobbezoo F, Ahlberg J, Raphael KG, Wetselaar P, Glaros AG, Kato T, et al. International consensus on the assessment of bruxism: Report of a work in progress. *J Oral Rehabil.* 2018;45(11):837-844. doi: 10.1111/joor.12663.
3. Manfredini D, Restrepo C, Diaz-Serrano K, Winocur E, Lobbezoo F. Prevalence of sleep bruxism in children: a systematic review of the literature. *J Oral Rehabil.* 2013;40(8):631-42. doi: 10.1111/joor.12069.
4. Friedman Rubin P, Erez A, Peretz B, Birenboim-Wilensky R, Winocur E. Prevalence of bruxism and temporomandibular disorders among orphans in southeast Uganda: A gender and age comparison. *Cranio.* 2018;36(4):243-249. doi: 10.1080/08869634.2017.1331784.
5. Yıldırım G, Özçelik C, Oğhan Türkoğlu M, Çelik Güven M. Evaluation of the Prevalence of Bruxism and Parents Awareness in Children Aged 4-7: A Cross-Sectional Clinical Study. *Türkiye Klinikleri J Dental Sci.* 2022;28(4):825 - 831. doi: 10.5336/dentalsci.2022-88813.
6. Abaklı İnci M, Özer H, Koç M. The Childhood Bruxism: Literature Review. *Curr Res Dent Sci.* 2023;33(4):256-260. doi:10.5152/CRDS.2023.4795.
7. Klasser GD, Rei N, Lavigne GJ. Sleep bruxism etiology: the evolution of a changing paradigm. *J Can Dent Assoc.* 2015;81:f2.
8. Guo H, Wang T, Niu X, Wang H, Yang W, Qiu J, et al. The risk factors related to bruxism in children: A systematic review and meta-analysis. *Arch Oral Biol.* 2018;86:18-34. doi: 10.1016/j.archoralbio.2017.11.004.
9. Manfredini D, Lobbezoo F, Giancrustofaro RA, Restrepo C. Association between proxy-reported sleep bruxism and quality of life aspects in Colombian children of different social layers. *Clin Oral Investig.* 2017;21(4):1351-1358. doi: 10.1007/s00784-016-1901-5.
10. de Alencar NA, Leão CS, Leão ATT, Luiz RR, Fonseca-Gonçalves A, Maia LC. Sleep Bruxism and Anxiety Impacts in Quality of Life Related to Oral Health of Brazilian Children and their Families. *J Clin Pediatr Dent.* 2017;41(3):179-185. doi: 10.17796/1053-4628-41.3.179.
11. Brancher LC, Cademartori MG, Jansen K, da Silva RA, Bach S, Reyes A, et al. Social, emotional, and behavioral problems and parent-reported sleep bruxism in schoolchildren. *J Am Dent Assoc.* 2020;151(5):327-333. doi: 10.1016/j.adaj.2020.01.025
12. 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. doi: 10.3389/fneur.2020.590779.
13. Serra-Negra JM, Paiva SM, Flores-Mendoza CE, Ramos-Jorge ML, Pordeus IA. Association among stress, personality traits, and sleep bruxism in children. *Pediatr Dent.* 2012;34(2):e30-4.
14. Korkmaz C, Bellaz İB, Kılıçarslan MA, Dikicier S, Karabulut B. Influence of psychiatric symptom profiles of parents on sleep bruxism intensity of their children. *Acta Odontol Scand.* 2024;82(1):33-39. doi: 10.1080/00016357.2023.2254374.
15. Türkoğlu S, Akça ÖF, Türkoğlu G, Akça M. Psychiatric disorders and symptoms in children and adolescents with sleep bruxism. *Sleep Breath.* 2014;18(3):649-54. doi: 10.1007/s11325-



- 013-0928-y.
16. Yazıcıoğlu İ, Ray PÇ. Evaluation of Anxiety Levels in Children and Their Mothers and Appearance of Sleep Bruxism in Turkish Children and Associated Risk Factors: A Cross-Sectional Study. *J Oral Facial Pain Headache*. 2022;36(2):147-154. doi: 10.11607/ofph.3011.
  17. Geniş B, Hocaoğlu Ç. Comorbid Psychiatric Disorders and Treatment Options in Temporomandibular Disorders and Bruxism. *Current Approaches in Psychiatry*. 2020;12(2):205-231. doi:10.18863/pgy.570861.
  18. Yağcı İ, Taşdelen Y, Kıvrak Y. Childhood Trauma, Quality of Life, Sleep Quality, Anxiety and Depression Levels in People with Bruxism. *Arch Neuropsychiatry* 2020;57:131-135. doi: 10.29399/npa.23617.
  19. Sateia MJ. International classification of sleep disorders-third edition: highlights and modifications. *Chest*. 2014;146(5):1387-1394. doi: 10.1378/chest.14-0970.
  20. American Psychiatric Association. *Diagnostic and Statistical Manual Of Mental Disorders*. 5th ed. Washington, DC, USA: American Psychiatric Association Publishing, 2013.
  21. Roy A, Ferraz Dos Santos B, Rompré P, Nishio C. Dental malocclusion among children with attention deficit hyperactivity disorder. *Am J Orthod Dentofacial Orthop*. 2020;158(5):694-699. doi: 10.1016/j.ajodo.2019.10.016.
  22. Alessandri-Bonetti A, Guglielmi F, Deledda G, Sangalli L, Brogna C, Gallenzi P. Malocclusions, Sleep Bruxism, and Obstructive Sleep Apnea Risk in Pediatric ADHD Patients: A Prospective Study. *J Atten Disord*. 2024;28(6):1017-1023. doi: 10.1177/10870547231226139.
  23. Ghanizadeh A. ADHD, bruxism and psychiatric disorders: does bruxism increase the chance of a comorbid psychiatric disorder in children with ADHD and their parents? *Sleep Breath*. 2008;12(4):375-80. doi: 10.1007/s11325-008-0183-9.
  24. Baad RK, Jagtap K. The study of role of stress in children with behavior disorders and orofacial lesions. *J Contemp Dent Pract*. 2012;13(4):559-61. doi: 10.5005/jp-journals-10024-1186.
  25. Ozkan S, Durukan E, Iseri E, Gürocak S, Maral I, Ali Bumin M. Prevalence and risk factors of monosymptomatic nocturnal enuresis in Turkish children. *Indian J Urol*. 2010;26(2):200-5. doi: 10.4103/0970-1591.65387.
  26. Muthu K, Kannan S, Muthusamy S, Sidhu P. Sleep bruxism associated with nocturnal enuresis in a 6-year-old child. *Cranio*. 2015;33(1):38-41. doi: 10.1179/2151090314Y.0000000006.
  27. Çelikkalp Ü, Yalçın Irmak A. Risk Factors Related to Psychosocial Problems in Adolescents. *Sakarya Med J*. 2022;12(2):245-254. doi:10.31832/smj.1016192.
  28. De Luca Canto G, Singh V, Conti P, Dick BD, Gozal D, Major PW, et al. Association between sleep bruxism and psychosocial factors in children and adolescents: a systematic review. *Clin Pediatr (Phila)*. 2015;54(5):469-78. doi: 10.1177/0009922814555976.
  29. da Costa SV, de Souza BK, Cruvinel T, Oliveira TM, Lourenço Neto N, Machado MAAM. Factors associated with preschool children's sleep bruxism. *Cranio*. 2024;42(1):48-54. doi: 10.1080/08869634.2021.1903663.
  30. Ferreira-Bacci Ado V, Cardoso CL, Díaz-Serrano KV. Behavioral problems and emotional stress in children with bruxism. *Braz Dent J*. 2012;23(3):246-51. doi: 10.1590/s0103-64402012000300011.
  31. Bulanda S, Ilczuk-Ryputa D, Nitecka-Buchta A, Nowak Z, Baron S, Postek-Stefańska L. Sleep Bruxism in Children: Etiology, Diagnosis, and Treatment-A Literature Review. *Int J Environ Res Public Health*. 2021;18(18):9544. doi: 10.3390/ijerph18189544.
  32. Us MC, Us YO. Evaluation of the relationship between sleep bruxism and sleeping habits in school-aged children. *Cranio*. 2023;41(6):569-577. doi: 10.1080/08869634.2021.
  33. 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. doi: 10.1080/08869634.2016.
  34. Goetttems 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. doi: 10.1111/ipd.12285.
  35. Chisini LA, San Martin AS, Cademartori MG, Boscato N, Correa MB, Goetttems ML. Interventions to reduce bruxism in children and adolescents: a systematic scoping review and critical reflection. *Eur J Pediatr*. 2020;179(2):177-189. doi: 10.1007/s00431-019-03549-8.
  36. 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. doi: 10.1080/08869634.2019.1581470.
  37. Rahmati M, Moayedi A, Zakery Shahvari S, Golmirzaei J, Zahirinea M, Abbasi B. The effect of hydroxyzine on treating bruxism of 2- to 14-year-old children admitted to the clinic of Bandar Abbas Children Hospital in 2013-2014. *J Med Life*. 2015;8(Spec Iss 4):241-244.