

## The Prevalence of Bruxism and Correlated Factors in Children Referred to Dental Schools of Tehran, Based on Parents' Report

Bahman Seraj<sup>1,2</sup>, DDS, Ms; Mehdi Shahrabi<sup>1</sup>, DDS, Ms; Sara Ghadimi<sup>\*1</sup>, DDS, Ms; Rahil Ahmadi<sup>3</sup>, DDS, Ms; Jaleh Nikfarjam<sup>1</sup>, DDS, Ms; Farid Zayeri<sup>4</sup>, PhD; Fatemeh Pour Taghi<sup>1</sup>, DDS and Hadi Zare<sup>1</sup>

1. Department of Pediatric Dentistry, Faculty of Dentistry, Tehran University of Medical Sciences, Tehran, IR Iran
2. Dental Research Center, Tehran University of Medical Sciences, Tehran, IR Iran
3. Department of Pediatric Dentistry, Faculty of Dentistry, Zahedan University of Medical Sciences, Zahedan, IR Iran
4. Department of Biostatistics, Faculty of Paramedical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, IR Iran

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### Abstract

**Objective:** Bruxism is defined as the habitual nonfunctional forceful contact between occlusal tooth surfaces. The aim of this study was to determine the prevalence of bruxism and correlated factors in children referred to dental schools of Tehran, based on parents' report.

**Methods:** This cross-sectional descriptive study was conducted on 600 4-12 year-old children with a mean age of  $7.4 \pm 2.4$  years, who were referred to four dental schools in Tehran. After collecting information with questionnaire filled out by parents,  $\chi^2$ , Fisher Test, Mann-Whitney and t-Test were used to analyze the data.

**Findings:** The prevalence of bruxism was 26.2%. Bruxism begun in average at the age of  $4.9 \pm 2$  years. Also it occurred 2.6 times more in children who had a family history of bruxism (father-mother), compared to children who didn't have such a history. 87% of children with bruxism had a history of distressing events in their life, and 13% of children with bruxism did not report any history of distressing events in their life. In this study most common oral habit was nail biting. In study of parasomnias, drooling was the most, and snoring the least reported sleep disorder. Bruxism in children with drooling was twice more than in other children. The prevalence of bruxism in children with temporomandibular disorder was 63.6% and in children without TMD was 24.7%.

**Conclusion:** Based on parents' report, 26.2% of children showed bruxism and there was a significant relation between bruxism and mother's job, family history, distressing event in life, parasomnias, especially drooling and sleep walking, TMD, hyperactivity, depression, acrophobia and lygophobia.

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**Key Words:** Bruxism; Temporomandibular Disorder; Psychological Factors; Parasomnia; Children

**\* Corresponding Author;**

**Address:** Department of Pediatric Dentistry, Faculty of Dentistry, Tehran University of Medical Sciences, Enghelab Ave, Tehran, Iran  
**E-mail:** sghadimi@tums.ac.ir

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## Introduction

Bruxism is a non-functional grinding or clenching of the teeth<sup>[1]</sup>. This habit can occur during the day and night and it can be conscious or non conscious<sup>[2]</sup>. The prevalence of bruxism has a wide range because of difficult diagnosis of this parafunctional habit and different methodologies. The etiology of bruxism is multifactorial and the studies concerning this matter couldn't gain exact results<sup>[3]</sup>. However, the discussed causes of bruxism include: local and mechanical factors, systemic factors, neurologic factors, psychological factors and genetics factors<sup>[4]</sup>. The most common clinical sign of bruxism is abnormal wear of teeth which is caused by periodic clenching or condensation of teeth. Other side effects of bruxism are tooth hypermobility, recession and inflammation of the gums, pain and hypertrophy of masseteric muscles, degenerative changes of temporomandibular joint and headache<sup>[3,5]</sup>.

Alert parents ask dentists and physicians about tooth grinding of their children as well as the side effects of it and also how to stop this habit. They often want to know the reason of this habit and its prevalence. Thus it is important for dentists and physicians to inform parents properly. The aim of this investigation was to determine the prevalence of the bruxism and its etiologic factors to make some helping recommendations to the parents. The awareness of parents about bruxism and its side effects make them keen to contribute in recall sessions; on the other hand, dentists and physicians will be able to recognize etiologic factors to eliminate them.

## Subjects and Methods

This cross-sectional descriptive study was done on 600 4-12 year old children, who were referred to four dental schools of Tehran in 2007-2008. After acquiring the parents' informed consent, a questioner was administrated to all participants. The questionnaire included two sections: The first

part contained the information about the age, sequence of birth, medical history and also parents' age, education, and job. The second part was questions related to the time of bruxism during the day or night, manifestation of distressing events in the family (such as parental divorce, birth of new baby, start going to school or death of child's loved one), family history of bruxism, temporomandibular joint disorder, parasomnias, oral habits (nail biting, pacifier sucking and lip or thumb sucking) and psychological disorders.

Temporomandibular joint disorders were considered as jaw clicking, pain or tenderness in muscles and limitation in mouth opening. Items related to psychological disorders include Irritability, seclusion, sadness, neophobia, crying easily, gazing at one point, hyperactivity, obsession, depression, acrophobia or lygophobia and finally parasomnias' items include drooling, sleep talking, sleep walking, mouth breathing and snoring.

After collecting information with the questionnaire filled out by parents, the analysis of data to determine the prevalence of bruxism and the percentage of contributing factors in children with or without bruxism was done, and the results of these 2 groups were compared.  $\chi^2$ , Fisher Test, Mann-Whitney and t-Test were used to analyze the data. A level of  $P < 0.05$  was considered as statistically significant.

## Findings

Our sample was comprised of 600 children, 314 boys (52.3%) and 284 girls (47.7%), with the mean age of  $7.4 \pm 2.4$  years. The average age of their mothers and fathers was  $33.9 \pm 5.4$  and  $39.3 \pm 6.0$  years respectively.

Bruxism began in these children in average at the age of  $4.9 \pm 2$  years. Based on parents' report, 157 (26.2%) children showed bruxism as a parafunctional habit. There was no significant relation between the gender, the sequence of birth, father's age, and parents' education and father's job with the prevalence of bruxism (Table 1).

**Table 1:** Distributaion of frequency of the gender, the sequence of birth and parents' education and their correlation with bruxism

Parameters	Percent (Number)	Yes	No	P value
<b>Gender</b>				
Girl	47.7 (286)	29	71	0.1
Boy	52.3 (314)	23.1	76.9	
<b>Sequence of birth</b>				
1	48.3 (290)	25.5	74.8	0.8
2	32.5 (195)	28.2	71.8	
3	13.3 (80)	25	75	
>3	5.9 (35)	25.7	74.3	
<b>Father's job:</b>				
Self-employed	52 (312)	26.3	73.7	0.9
Employed	44.7 (268)	25.4	74.6	
Jobless, Retired, Dead	3.3 (20)	35	65	
<b>Mother's job:</b>				
Full time	76.2 (457)	28.7	71.3	0.03
Self-employed	22 (132)	18.9	81.1	
Employed	1.8 (11)	9.1	90.9	

The prevalence of bruxism was 28.7% in full time mothers, 18.9% in employed and 9.1% in self-employed mothers. The analysis of data showed significant difference between the job condition of mothers and the prevalence of bruxism; the prevalence of bruxism in children with full time mothers was higher ( $P=0.03$ ). Also 7.8% of children had fathers with bruxism history, 6.8% mothers with bruxism history and 1.3% of children had both parents bruxism history. The analysis of data showed a significant correlation between the family history of bruxism and the prevalence of it ( $P<0.001$ ), which the prevalence of bruxism was 20.8% in children without family history of bruxism, 51.1% in children with fathers history of bruxism, 51.2% in children with mothers history

of bruxism and 87.5% in children with both parents history of bruxism (Table 2).

According to parents' report, 7.6% of children had a history of distressing events in their life, whereas 87% of children with bruxism had a history of distressing events in their life, and 13% of children with bruxism didn't report any history of distressing events in their life. The difference between these 2 groups was significant ( $P<0.001$ ).

Parasomnias were stated by parents in 53.2% of children, drooling being the most (25.8%), and snoring the least (4.5%). Distribution of frequency of parasomnias is shown in Table 3. Bruxism was seen in 35.1% of children with parasomnias and merely in 16% of subjects without any sleep disorders. There was a

**Table 2:** Distribution of frequency of family history of bruxism, distressing events and their correlation with bruxism

Parameters	Number (Percent)	Bruxism (%)		P value
		Yes	No	
<b>Family History of bruxism</b>	None	504 (84)	20.8	<0.001
	Father	47 (7.8)	51.1	
	Mother	41 (6.8)	51.2	
	Both	8 (1.3)	87.5	
<b>Distressing events</b>	7.6 (46)	87	13	<0.001

**Table 3:** Frequency of parasomnias and their correlation with bruxism

Parameters	Number (Percent)	Bruxism (%)		P value
		Yes	No	
<b>Parasomnias</b>	319 (53.2)	35.1	64.9	<0.001
<b>Drooling</b>	155 (25.8)	58.1	41.9	<0.001
<b>Sleep talking</b>	116 (19.3)	32.8	67.2	0.07
<b>Sleep walking</b>	19 (3.2)	63.2	36.8	0.001
<b>Mouth breathing</b>	126 (21)	32.5	67.5	0.07
<b>Snoring</b>	27 (4.5)	37	63	0.2
<b>Oral Habits</b>	113 (18.8)	30.1	69.9	0.3
<b>TMD*</b>	22 (3.7)	63.6	36.4	<0.001
<b>Systemic Diseases</b>	35 (5.8)	28.6	71.4	0.7
<b>Asthma- Allergy</b>	44 (7.3)	27.3	72.7	0.9

\* Temporomandibular disorder

significant difference between these 2 groups, and there was a correlation between drooling, sleep walking and bruxism ( $P<0.001$ ).

Oral habits were reported in 18.8% of children. Nail biting was the most frequent habit with a prevalence of 12.5%. Thirty-four (30.1%) of children with oral habits demonstrated bruxism, while this was observed in 25.3% of other children; however this was statically not significant ( $P=0.3$ ).

In the study of TMD, the frequency of joint click was 1.2%, facial muscles pain 0.7%, limitation of opening the mouth 2%, and pain during opening the mouth 0.7%. The prevalence of bruxism in children with TMD was 63.6% and in children without TMD 24.7%; the difference was significant ( $P<0.001$ ). Based on our study there was no significant relationship between

the history of asthma and allergy or systemic disease with bruxism (Table 3).

Finally, in our study psychological disorders, i.e. irritability (47.2%), crying easily (38.7%) and hyperactivity (19.8%) were the most frequent ones. There was a significant relationship between depression, acrophobia and lygophobia with the prevalence of bruxism (Table 4).

## Discussion

In the present study conducted on 600 children with an average age of  $7.4\pm 2.4$  years, the prevalence of bruxism was 26.2%. In different studies the results ranged between 7% and 88%<sup>[6]</sup>. Cheifetz<sup>[7]</sup> declared the prevalence of

**Table 4:** Distribution of frequency of psychological disorders and their correlation with bruxism

Parameters	Number (Percent)	Bruxism(%)		P value
		Yes	No	
<b>Irritability</b>	283 (47.2)	28.6	71.4	0.196
<b>Seclusion</b>	54 (9)	20.4	79.6	0.310
<b>Sadness</b>	15 (2.5)	40	60	0.173
<b>Neophobia</b>	133 (22.2)	30.8	69.2	0.166
<b>Crying Easily</b>	232 (38.7)	30.2	69.8	0.076
<b>Gazing at one point</b>	27 (4.5)	40.7	59.3	0.078
<b>Hyperactivity</b>	119 (19.8)	37	63	0.003
<b>Obsession</b>	40 (6.7)	35	65	0.188
<b>Depression</b>	7 (1.2)	85.7	14.3	0.002
<b>Acrophobia or Lygophobia</b>	192 (32)	32.3	67.7	0.017

bruxism in children under 17 years old 38% based on parents' reports while Liu et al<sup>[8]</sup> stated that bruxism occurred in 6.5% of 2-12 year-old Chinese children. Also Chen and coworkers<sup>[9]</sup> reported the prevalence of bruxism in 3-6 year-old Chinese children 36.4%. Reding<sup>[10]</sup> reported the prevalence of bruxism in 3-17 year-old American children 15.1%. The prevalence of bruxism in children in Saudi Arabia was reported 8.4% by Farsi<sup>[11]</sup>. These differences in the prevalence of bruxism are because of difficult diagnosis of bruxism, various methods in collecting data and also diverse samples from different racial origins.

In the present study the beginning age of bruxism was  $4.9 \pm 2$  years. There was no correlation between age and gender with bruxism. Chen<sup>[9]</sup>, Laberge<sup>[12]</sup>, Reding<sup>[10]</sup> reported the same result. But Cheifetz et al<sup>[7]</sup> reported the beginning age of bruxism to be 3.6 years and also showed that there was a male predilection in acquiring bruxism but they gave no explanation for this.

In our study there was no significant correlation between age, parents' education and father's job with the prevalence of bruxism in children and these results were the same as Laberge and Cheifetz studies<sup>[12,7]</sup>. But in this study the difference in the prevalence of bruxism in full time mothers and working mothers was significant which may be to more attention of full time mothers, because they spend more time with their children.

One of the etiologic factors assessed in the present study was the occurrence of distressing events in the child's life and its relationship with the prevalence of bruxism, which was not mentioned in any other study till now. One of these events was divorce of parents, separation of one of the parents for any reason, death of the loved one of the child, birth of a new child, the beginning of kinder care or school, watching terrifying movies, etc. Our study showed a significant difference between these events and the prevalence of bruxism.

One of the etiologic factors of bruxism is heredity. In this study there was a direct relation between heredity and bruxism. Bruxism occurred 2.6 times more in children who had a family history of bruxism (father-mother),

compared to children who did not have such a history. Reding et al also confirmed this direct relation<sup>[10]</sup>. The results of our study regarding this matter are in agreement with Cheifetz et al. These researchers stated if either parent had a history of bruxism the chance of demonstrating bruxism by their children will be 1.8 times more<sup>[7]</sup>.

Also there was a significant relationship between bruxism and parasomnias. 25.8% of children had drooling and 3.2% of children had sleepwalking which showed a direct relationship with bruxism. Bruxism in children with drooling was two times more than in other children. Weidman et al also showed a significant relation between bruxism and parasomnias and declared that children who had drooling or talking during sleep had more chance to get bruxism<sup>[13]</sup>. This is in agreement with Cheifetz et al study, although in their research, drooling was 33% and sleep talking 16%.

They expressed that in children who had drooling and sleep talking the bruxism was observed 1.7 and 1.6 times respectively more than in other children<sup>[7]</sup>. Kato et al also confirmed this relationship and explained that bruxism causes to provisionally increase drooling to lubricate the esophagus and oral cavity, thus it is logical to expel the excess of saliva, consequently drooling is more reported in these children<sup>[15]</sup>.

In our study the oral habit was seen in 18.8% of children who had bruxism. The most common (12.5%) oral habit was nail biting, which was reported 33.37% in Bosnyak study, 48% in Egermark study, 51% in Farsi study and 55% in Weideman study. All of these investigations showed a far more prevalence compared to our results but in their studies nail biting had the most frequency. Here we considered no relationship between bruxism and oral habits. In contrast to our study Cheifetz et al<sup>[7]</sup> declared that the children with bruxism revealed less oral habits but Widmalm<sup>[18]</sup> reported that the bruxism is seen along with other oral habits such as thumb sucking and only in 3.4% of subjects existed without oral habit.

In the present study 3.7% of children had TMD. Statistical analysis showed a significant relation between TMD and bruxism. This result

was similar to those of Widmalm<sup>[18]</sup>, Restrepo<sup>[19]</sup> and Winocur<sup>[20]</sup> but Cheifetz<sup>[7]</sup> found no significant relationship between TMD and bruxism.

In our study there was no relation between asthma and allergy with bruxism, which was similar to Cheifetz et al<sup>[7]</sup>. In contrast to our result Weideman et al<sup>[13]</sup> declared that the children with bruxism were even healthier than other children<sup>[13]</sup>. Marks also showed that there was an association between bruxism, headache and allergy<sup>[14]</sup>.

In the study of psychologic disorders of children, hyperactivity, depression, acrophobia and lygophobia revealed a significant relation with bruxism. Cheifetz<sup>[7]</sup> and Agargun<sup>[21]</sup> also confirm the relation between bruxism and psychologic disorders, also the relation between hyperactivity and bruxism. Our results were similar to those of Malki<sup>[22]</sup> and Bimstein<sup>[23]</sup>. Furthermore, our result regarding depression was similar to that of Manfredini<sup>[24]</sup>.

In this descriptive study we were encountered with limitations such as the credibility and reliability of the parents' answers to the questionnaire.

## Conclusion

Based on parents' report, the prevalence of bruxism in 4-12 old children was 26.2% and the average age for beginning of bruxism was  $4.9 \pm 2$  years. In the study of etiologic factors there was a significant relation between bruxism and mother's job, family history, distressing event in life, parasomnias specially drooling and sleep walking, TMD, hyperactivity, depression, acrophobia and lygophobia.

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**Conflict of Interest:** None

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