Biomedical Communication

Parental Awareness of Bruxism in Saudi Children: A Public Health Concern

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ABSTRACT

Bruxism is defined as a non-functional rhythmic and/or spasmodic gnashing, grinding, and clenching of the teeth. Parents are often unaware of bruxism in children. The aim of this study is to assess the awareness of bruxism among parents of children in Saudi Arabia. Across-sectional study approved by the (IRB) was conducted using a questionnaire, which was developed to assess the awareness of bruxism among parents based on the American Association of Sleep Medicine criteria. The questionnaire included questions distributed among the following elements: a) demographic data, b) prevalence of self-reported bruxism by parents, c) parental history of bruxism, d) child's sleep habits, e) the seeking of professional medical help, and f) parents' knowledge regarding bruxism. Data were analyzed using SPSS 24.0 version statistical software. Fifty-five of the children were male (n = 824) and 45% were female (n = 675). The children's ages ranged from 6-10 years. The parent-reported prevalence of bruxism among their children was 45.7%. About 38% of parents were aware of what bruxism is, 34.7% were doubtful, and 27.8% were not aware of it, which is statistically significant ($p<0.0001$). Almost 52% of parents expressed a positive response to the question of whether or not "bruxism could endanger their child's health". Fifty-two percent of participants selected psychological causes as a trigger for bruxism. In Conclusion the majority of parents lack awareness of bruxism. A multidisciplinary approach including dentistry should be considered to increase parental awareness about bruxism in children.

KEY WORDS: AWARENESS, BRUXISM, CHILDREN, PUBLIC HEALTH.

INTRODUCTION

Bruxism is defined by rhythmic and/or spasmodic gnashing, grinding, and clenching of teeth involuntarily and in a non-functional manner. These mandibular movements can occur both nocturnally and diurnally and may occasionally cause occlusal trauma (Shetty et al., 2010). Temporomandibular joint (TMJ) disorders often arise from bruxism; they are accompanied by a number of signs and symptoms, including tension headaches, wear on teeth, a clicking jaw, facial muscle fatigue, and difficulty chewing and yawning. Furthermore, reduction in sleep quality is also associated with bruxism (Carra et al., 2011). Lavigne et al. (2003) found that complaints about sleep quality decline with age, from 14% in children, 8% in adults, and 3% in patients over 60. Bruxism's prevalence in children and adolescents varies widely among the available studies due to heterogenous data collection methods and targeted groups (Prado et al., 2018).

Despite that, a recent systematic review conducted by Melo et al. (2019) reported that the prevalence of bruxism among the young population (children and adolescents) ranges between 3.5% and 49.6%. Diagnosing bruxism is often challenging for health care providers. The diagnostic markers are based upon the following criteria: a history of clenching teeth at least 3-5 nights a week for a period of six months or more, muscle soreness in masticatory and mandibular regions upon waking up, tension headaches, tooth wear beyond a normal level, masseter muscle hypertrophy, evidence of regular cheek or tongue biting, hypersensitivity in the TMJ area, or unusual sounds/clicking in the jaw. While polysomnography (PSG, or sleep study) serves as a standardized method of diagnosis, it is yet considered as a costly diagnostic procedure (Kato et al., 2001, Alves et al., 2019, Soares et al., 2020).

The etiology of bruxism is multifactorial including the psychosocial (anxiety, stress, personality disorders), the

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pathophysiological (oral health), and the morphological (birth defects) (Lobbezoo et al., 2006). Clenching may be triggered by fear or anxiety, and these psychosocial factors have recently been shown to be particularly impactful in diurnal forms of bruxism (Manfredini, & Lobbezoo, 2009). Oral health, like all forms of health, is an important feature of a parent's or caregiver's responsibility for a child. Unfortunately, knowledge of oral health and oral pathologies is lacking in many such caregivers, limiting their understanding of conditions like bruxism. Dentists, therefore, play an essential role in raising awareness of these conditions and informing patients of their effects and symptoms (Silva et al., 2017).

Furthermore, a small number of studies have been carried out on the nature and level of public knowledge regarding bruxism among parents and caregivers. Serra-Negra et al. (2013) evaluated the parents/guardian knowledge about the bruxism of their children and reported that 95.5% of the responses from 221 participants correctly described bruxism. Moreover, Silva et al. (2017) assessed the knowledge of parents/guardians about nocturnal bruxism in children and adolescents and found that only 38.1% of the respondents among a sample of 134 were able to correctly define the condition.

Recently, the results of the study conducted by Alves et al. (2019) on the knowledge of parents/caregivers about bruxism in children showed that 67% of the caregivers responded in the affirmative when asked whether they knew what bruxism was, but only 52.4% of those could define the habit correctly. In addition, nearly three quarters of the study's respondents could identify the causes of bruxism, while 16.5% attributed the condition to emotional factors. Monitoring and measuring parents' and caregivers' level of knowledge about bruxism is important in assessing the wellbeing of children with the disorder. Not only will such an assessment aid us in understanding the problem, but it will also provide dentists with relevant information and allow them to take informed action in raising awareness among their patients and society. Additionally, it contributes to early diagnostic and preventive measures to reduce the oral consequences of the bruxism, and a deeper clinical exploration of possible associated co-factors. Therefore, the aim of this study is to assess the parental awareness about bruxism in children in Saudi Arabia.

MATERIAL AND METHODS

A cross-sectional study was conducted starting April 2020 and ended in July 2020 to assess parental knowledge regarding bruxism in children (6-10 years old) in Saudi Arabia. This study was reviewed and approved by Institutional Review Board (IRB) (no. E-20-4860) of King Saud University in Riyadh, KSA. One thousand four hundred and ninety-nine (1499) participants agreed to participate in the study. A validated electronic questionnaire which is based on the American Association of Sleep Medicine criteria was used and the parent's agreement to participate at the beginning of the questionnaire considered as a consent for participating in the study. Parents of Saudi, healthy, living in Saudi Arabia and aged (6-10 years old) were included in the study. Parents of non-Saudi, medically compromised/special needs children, not living in Saudi Arabia and younger than 6 years and older than 10 years were excluded from the study.

Acknowledgments & Ethical Approval: This work was part of grant number E-20-4860, supported by King Saud University upon the recommendation of the Research Committee following a review of the Institutional Research Board on the ethical aspects of the proposal. Prior to filling the questionnaires, participants were given the choice of whether to participate, and they were informed that the study results would be used in publications. The questionnaire was developed to assess the parental knowledge and awareness about bruxism in children in Saudi Arabia. It included 22 questions and divided into 6 main sections: a) demographic data, b) prevalence of self-reported bruxism by parents, c) parental history of bruxism, d) child's sleep habits, e) the seeking of professional medical help, and f) parents' knowledge regarding bruxism. A power analysis was done to specify the targeted sample size. The sample size was calculated to be 300 subjects to achieve a significance level at the 95th percentile confidence level and power of 80 percent, with 0.5 estimated effect size.

The electronic survey was distributed using the institution's social media platforms. Additionally, participants were encouraged to share the survey with others. Moreover, prior to the main questionnaire distribution, a pilot study was performed to test the clarity and the understanding of the questionnaire by parents which was assessed by one of the authors (ZH). Additionally, parents with multiple children in the same age range answered the survey based on their eldest child. Data were entered in MS Excel and analyzed using SPSS 24.0 version statistical software (IBM Inc., Chicago USA). Descriptive statistics (frequencies and proportions) were used to describe the categorical variables. Furthermore, Pearson's chi-square test was used to compare the distribution of responses and categorical variables in order to observe the association between the categorical variables. A p-value of ≤ 0.05 was used to report the statistical significance of results.

RESULTS AND DISCUSSION

One thousand five hundred eighty-four parents of children aged between 6-10 years old completed the online questionnaire. Of those, 1,499 study subjects agreed to participate in the study. 55% of the children were male (n = 824) and 45% were female (n = 675). The children's ages ranged from 6-10 years, where 30.4% were six years old. The majority of participants (69.2%) reported that they were located in the central region of Saudi Arabia. The parent-reported prevalence of medical/psychological/emotional conditions in their children was 11.1% (Table 1).

Table 1. Characteristics of study subjects (n=1499)

Characteristics	No.(%)
Gender of the child	
Male	824(55)
Female	675(45)
Age of the child (in years)	
6	455(30.4)
7	214(14.3)
8	234(15.6)
9	225(15.0)
10	371(24.7)
Region of residence	
The middle region	1038(69.2)
The east region	193(12.9)
The west region	149(9.9)
The north region	65(4.3)
The south region	54(3.6)
Does your child have any medical or psychological or emotional condition?	
Yes	167(11.1)
No	1332(88.9)

The parent-reported prevalence of bruxism among their children was 45.7%; additionally, 12.9% reported that more than one child in their household was affected by bruxism. It was of interest to evaluate the parental history of bruxism. 8.5% of fathers and 8.3% of mothers reported having the problem of bruxism. Regarding the need to address their child's bruxism, 57% of parents responded positively toward the idea of seeking help for their bruxer child; 70.6% of them wanted to seek help from a dentist, and 79.5% wanted to know more information regarding bruxism in children (Table 2).

The assessment of knowledge towards bruxism among parents shows that 37.5% of parents were aware of what bruxism is, 34.7% were doubtful, and 27.8% were not aware of it, which is statistically significant ($p<0.0001$). A higher proportion (91.5%) of parents reported the concept of bruxism as "when a person clenches hard on their teeth, making an audible sound which can be heard by others," which is highly statistically significant ($p<0.0001$). About 51.6% of parents expressed a positive response to the question of whether or not "bruxism could endanger their child's health," whereas 37.2% answered "I don't know," which produced a statistically significant ($p<0.0001$) result. The multiple responses towards possible bruxism triggers show a statistically significant difference; 51.9% of participants selected psychological causes as a trigger for bruxism, 29.5% selected "emotional," 28.3% selected unknown causes, 28.2% selected dental problems, and 20.5% selected neurological issues ($p<0.0001$) (Table 3).

The distribution of parents' knowledge in relation to the reported prevalence of child bruxism shows a statistically significant association for the three items (what is the concept of bruxism, bruxism could endanger a child's health, and reasons that trigger bruxism). A higher proportion of parents who reported that their child did not have bruxism mentioned three items as the concept of bruxism ("when a person clenches hard on their teeth, making an audible sound which can be heard by others," "closing the teeth together," and "pressing on the teeth due to a habit like a thumb-sucking or tongue-pressing") when compared with parents who reported that their child did have bruxism ($p=0.005$).

Table 2. Prevalence of self-reported bruxism by parents and response towards the level of help required

Items of prevalence	No. (%)
Does your child have bruxism?	
Yes	685(45.7)
No	814(54.3)
Do you have other children with bruxism?	
Yes	193(12.9)
No	1219(81.3)
I don't know	
Does the father have bruxism?	
Yes	87(5.8)
No	128(8.5)
Maybe	
Does the mother have bruxism?	
Yes	1258(83.9)
No	113(7.5)
Maybe	
Would you seek help for your bruxer child?	
Yes	125(8.3)
No	1253(83.6)
Maybe	121(8.1)
Who will you seek help from?	
Physician	854(57.0)
Dentist	175(11.7)
Maybe	470(31.4)
Who will you seek help from?	
Physician	364(24.3)
Dentist	1059(70.6)
Alternative medicine practitioner	76(5.1)
Do you think you need more information regarding bruxism in children?	
Yes	1191(79.5)
No	88(5.9)
Maybe	220(14.7)

Also, there is a statistically significant association between the responses to the item of knowledge ("Do you think bruxism could endanger child's health?") and prevalence of child bruxism; 52.4% of parents who responded negatively to this question also reported that their child had bruxism, while 57.2% of parents who responded positively to this question reported that their child did not have bruxism, which is statistically significant

(p=0.039). Also, there is a statistically significant association between the responses toward reasons that trigger bruxism and parent-reported prevalence of their child's bruxism (p<0.0001) (Table 4).

Table 3. Distribution and comparison of parent's knowledge regarding bruxism

Items of knowledge	No. (%)	χ^2-value	p-value
Are you aware of what bruxism is?			
Yes	562(37.5)	22.28	<0.0001
No	417(27.8)		
Maybe	520(34.7)		
What is the concept of bruxism?			
When a person clenches hard on his teeth that makes an audible sound, which can be heard by others	1372(91.5)	3548.68	<0.0001
Closing the teeth together	15(1.0)		
Pain in the joints of the jaws	19(1.3)		
Pressing on the teeth by a habit like a thumb sucking and tongue	93(6.2)		
Do you think bruxism could endanger a child's health?			
Yes	773(51.6)	376.48	<0.0001
No	168(11.2)		
I don't know	558(37.2)		
What do you think triggers bruxism? (Multiple responses)			
Emotional	442(29.5)	1058.30	<0.0001
Psychological	778(51.9)		
Physical issues	81(5.4)		
Unknown causes	424(28.3)		
Dental problems	423(28.2)		
Neurological issues Parasites	307(20.5)		
	34(2.3)		

The factors associated with the reported prevalence of bruxism were found to be the following: age of child, region, the child's existing medical/psychological/medical conditions, the way the child sleeps at night, whether the child sleeps alone, and whether either of the parents has bruxism. A higher proportion (55.6%) of the children with bruxism were six years old, 54.4% were located in the western region, 61.1% were reported to have a medical/psychological/emotional condition, 64% were reported to have a restless sleep, 52.7% did not sleep alone, 68% of the fathers had bruxism, and 63.2% of the mothers had bruxism, all of which are statistically significant (Table 5).

The primary outcome of this study was the level of knowledge among parents concerning bruxism. Of those queried in the present study, 47.5% have claimed to know what bruxism is, which is a lower figure than the results found in the study done by (Serra-Negra et al., 2013) who evaluated the family knowledge about bruxism and 95% of the parents reported that they know what bruxism is. (Alves et al., 2019) evaluated the knowledge of the parents/caregivers about bruxism in children attending the pediatric dental clinics and their results showed that 67% of the participants reported knowing bruxism which is almost similar to the results of the present study.

Inspite of that almost 38% of the participants in this study reported knowing what bruxism is, 91.5% of the respondents defined bruxism properly by choosing the correct definition in the questionnaire, which is in contrast with the results of (Silva et al., 2017; Clementino et al., 2017; Alves et al., 2019) who received a lower rate of correct definitions, at 52.4% and 38.1%, and 35.8% respectively. This difference can be explained that most of our participants (69%) were from the central region of Saudi Arabia which is known to be one of the highest educated regions and has a lot of medical and dental educational campaigns and programs at different areas in the region. Among all participants, 253 parents (16.8%) and 685 children (45.7%) reported that they have bruxism. The prevalence of self-reported bruxism in parents and children in the present study is in agreement with the (Serra-Negra et al., 2013) (16.5% of caregivers and 48% of children). However, the prevalence of bruxism in children in the current study is higher than that reported by (Clementino et al., 2017) (32.4%) and (Alves et al., 2019) (25.2%).

The differences in the prevalence of bruxism in children among studies could be attributed to the diversity found in the studied age groups and study designs. The present study did not find a significant association (P=0.501) between gender and bruxism, which is in accordance

with the findings reported by (Bharti et al., 2006; Manfredini et al., 2009; Suguna et al., 2020). However, in the research conducted by (Clementino et al., 2017) the female children were statistically associated with bruxism (64.5%). Whereas (Alves et al., 2019) found that bruxism was more prevalent in male children. These differences can be explained by the low number of participants in both studies and the predominance of one participating gender over the other. Brancher et al. (2020) reported that children who had greater emotional symptoms according to their caregivers' evaluation had a higher prevalence of bruxism.

Table 4. Association between the self-reported prevalence of bruxism and parent's knowledge towards bruxism

Items of knowledge	Child has bruxism		χ2-value	p-value
	Yes	No		
Are you aware of what bruxism is?				
Yes	267(47.5)	295(52.5)	2.61	0.271
No	177(42.4)	240(57.6)		
Maybe	241(46.3)	279(53.7)		
What is the concept of bruxism?				
When a person clenches hard on his teeth				
that makes an audible sound, which can be heard by others	644(46.9)	728(53.1)	12.80	0.005
Closing the teeth together	6(40)	9(60)		
Pain in the joints of the jaws	9(47.4)	10(52.6)		
Pressing on the teeth by a habit like a thumb-sucking or by the tongue	26(28)	67(72)		
Do you think bruxism could endanger a child's health?	331(42.8)	442(57.2)	6.48	0.039
Yes	88(52.4)	80(47.6)		
No	266(47.7)	292(52.3)		
I don't know				
What do you think triggers bruxism? (Multiple responses)	232(52.5)	210(47.5)	105.56	<0.0001
Emotional	272(35)	506(65)		
Psychological	29(35.8)	52(64.2)		
Physical issues	254(59.9)	170(40.1)		
Unknown causes	140(33.1)	283(66.9)		
Dental problems	126(41)	181(59)		
Neurological issues	16(47.1)	18(52.9)		
Parasites				

χ^2-value = Pearson's chi-square

The recent research performed by Soares et al., (2020) indicated that children with bruxism often have other oral habits, such as lip biting, that may result from emotional tension. Moreover, in the present study, it was of interest to assess parents' knowledge about the risk factors of bruxism, including emotional factors and 29.5% of the participants identified emotional factors as the etiology for bruxism. Alves et al. (2019) reported that 16.5% of the participants believes the main cause of bruxism in children is related to emotional factors. On the other hand, the percentage of participants who reported emotional factors to be the main factor causing bruxism was considerably higher 63.8% in the study by (Serra- Negra et al., 2013). The contrasting results indicating that emotional factors are the causal reason for bruxism in children might be due to differences in the educational level of the participants in the studies.

The results of our study showed a statistically significant association with sleep type (restless sleep) and bruxism ($p < 0.001$), which is in agreement with the results reported (Serra-Negra et al., 2013) who found a significant association between childhood bruxism and restless sleep. Additionally, (Clementino et al., 2017) reported a significant relation between agitated sleep and bruxism. In contrast, (Alves et al., 2019) found no such correlation. Our findings are coinciding with the International Classification of Sleep Disorders (ICSD-3), which consider bruxism a sleep-related movement disorder associated with arousals during the night. In close agreement with (Serra-Negra et al., 2013), this study found that 68% of fathers and 63% of mothers with bruxism had children with bruxism. This provides considerable evidence for the heritability of bruxism, or at least heritability in the parafunctional habits which lead to bruxism and in agreement with the literature review done by (Lobbezoo et al., 2014) who found that all the reviewed studies concluded that bruxism appears to be (in part) genetically determined.

The current study had a convenient sample from the Saudi population, which makes generalization of the results difficult to apply on similar populations. Therefore, further studies with representative samples should be conducted as a community-based studies. The assessment of the parents' knowledge will enable the health providers

to formulate policies, to educate and clarify the habit to the parents. Furthermore, parents will be able to identify the presence of bruxism in their children and seek early treatment if necessary, that will lessen the complications that might take place as consequences to this parafunctional habit. The limitations of the present study include a possible reporting bias involved in the data, as the reported emotional conditions were based on the parents' evaluation. Furthermore, each child's sleep quality was subjectively assessed by parents, and was not measured using a numerical scale. Future research including clinical examination for the pediatric dental patients is needed to better understand the associated factors of bruxism and their possible health impact in children.

Table 5. Factors associated with the self-reported prevalence of bruxism

Factors	Child has bruxism		χ^2-value	p-value
	Yes	No		
Gender of the child				
Male	383(46.5)	441(53.5)	0.453	0.501
Female	302(44.7)	373(55.3)		
Age of the child (in years)				
6	253(55.6)	202(44.4)	28.89	<0.0001
7	90(42.1)	124(57.9)		
8	98(41.9)	136(58.1)		
9	82(36.4)	143(63.6)		
10	162(43.7)	209(56.3)		
Region of residence				
The middle region	477(46)	561(54)	19.36	0.001
The east region	93(48.2)	100(51.8)		
The west region	81(54.4)	68(45.6)		
The north region	20(30.8)	45(69.2)		
The south region	14(25.9)	40(74.1)		
Does your child have any medical or psychological or emotional condition?				
Yes	102(61,1)	65(38.9)	17.92	<0.0001
No	583(43.8)	749(56.2)		
How many hours does your child sleep at night?				
Less than 8 hours	109(42.1)	150(57.9)	1.65	0.199
More than 8 hours	576(46.5)	664(53.5)		
How does your child sleep at night?				
Restless (moves a lot, frequently wakes up fearful-crying-worried, sleeping hours are not smooth and continuous)	171(64.0)	96(36.0)	69.51	<0.0001
Normal (continuous hours of calm sleeping)	444(39.5)	680(60.5)		
Other	70(64.8)	38(35.2)		
Does your child sleep alone?	161(34.4)	307(65.6)	39.40	<0.0001
Yes	404(52.7)	362(47.3)		
No	120(45.3)	145(54.7)		
Sometimes	87(68)	41(32)	35.28	<0.0001
Does the father have bruxism?	535(42.5)	723(57.5)		
Yes	63(55.8)	50(44.2)		
No				
Maybe	79(63.2)	46(36.8)	20.96	<0.0001
Does the mother have bruxism?	542(43.2)	711(56.7)		
Yes	64(52.9)	57(47.1)		
No				
Maybe				

χ^2-value = Pearson's chi-square

CONCLUSION

The importance of parents gaining general knowledge of bruxism cannot be overstated. Bruxism is usually first identified in children by their parents. The present study shows that the majority of parents lack awareness of bruxism, its causes, where to seek help for the condition and the possible complications. A multidisciplinary approach with dentistry which has a major role in diagnosing and treating bruxism should be considered to improve educational tools to increase parental awareness about bruxism in children.

Conflict of Interest: The authors declare that they have no conflicts of interest.

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