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Research Article

**THE PREVALENCE OF BRUXISM AND DENTAL WEAR IN  
CHILDREN IN RELATION TO SMART DEVICES AND VIDEO  
GAMES****Noor Al-Swaje\***, Alanoud Al shammary, Shatha Al-Khalifah S, Prof. Sana Shafshaks  
Riyadh Elim University, Riyadh, Saudi Arabia.**Abstract:**

**Aim:** The aim of the study is to check for the prevalence of Bruxism in children between 5-10 years, using smart devices and/or video games.

**Materials and Methods:** A total of 200 school children with mixed dentition aged from (5-10 years) of both genders were randomly selected for the study. They were examined for tooth wearing, their parents responded to a questioner concerning Participation of bruxism and using smart devices by their children.

**Result:** The final study sample comprised of 204 children, they were 50 boys and 154 girls, with an average age of 5-10 years old. The prevalence of tooth wear resulting from Bruxism among the sample was (59.2%). The prevalence of tooth wear among children having a smart device (I Pad, or play station) for more than two years was higher than those who had it for less than two years. The prevalence of tooth wear was noted to be increased as the frequency of playing per week increases. All children playing for more than 5 hours showed clinical signs of tooth wear (prevalence of 95%). Bruxism was noticed in almost all of the children whose parents stated that they hear crushing sounds at night prevalence of (76.1%). Noticeably, even though (45.6%) declared that they do not hear crushing sounds during sleep.

**Conclusion:** Tooth wear due to Bruxism is very prevalent among children who possess Smart devices and or Play Station, by comparison to their counterpart; and the risk of developing it is even higher during the first 2 years of possession of the device.

In addition, both frequency and duration of exposure to the device increase the risk of Bruxism significantly.

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**INTRODUCTION:**

The term Bruxism came from the Greek word "Brychein" that was first described in 1931 as an excessive grinding of teeth together. The American Sleep Disorder defined Bruxism as tooth grinding during sleep plus one of the followings: tooth wear, sounds or jaw muscle discomfort I the absence of medical problem. (Ghadah, 2004)

The exact mechanism behind Bruxism is still unknown; one study revealed that it is associated with elevated level of adrenaline like hormone. (Lindemeyer, 2011)

Bruxism has been classified as a movement disorder related to sleep. (American Academy of Sleep Medicine, 2005)

Although, the most commonly reported habit in children that is related to stress is nail biting, recently Bruxism started to be seen in children. (Bahman, 2010)

Prevalence of Bruxism among children between 7 and 10 years was reported to be 35.3% in Brazil. (Serra-Negra et Al, 2010) In USA, Insana et al (2013) found that 36.8 % of preschool children are doing Bruxism, while 49.6 % of first grade students practice Bruxism. Their study also, revealed that in preschool children, bruxers tend to be anxious, depressed, withdrawn and having somatic complains.

Lam et al, 2011 reported that children with sleeping Bruxism are more likely to have chronic diseases, allergic rhinitis, asthma and upper respiratory tract infections

In 2015, the Management Information System of University of Northern Iowa report that children consume a lot of time using messaging application of smart devices. This has many advantages but also have disadvantages.

Many studies related playing with smart and/or electronic games to behavioral changes, increased aggression thoughts and feelings (Anderson and Dill, 2000, Anderson and Bushman, 2001, Gentile, Lyuch and Walsh, 2004) No available studies discussed the relationship between effect of those devices on practicing Bruxism, which was the motivation behind conducting this research.

**MATERIALS AND METHODS:**

Approval from the RCDP ethical committee for conducting the study was obtained also the approval from the schools principals.

The study was carried out In Riyadh, Saudi Arabia. Two private schools where selected randomly for the study. Data was collected from children aged from (5-10 years) of both genders. The reason for the selection

of this age group is to include mixed dentition. 300 informed consents combined with the questionnaire where sent to the chosen schools 150 each to be answered by the parents to approve their share in the study. 204 answered questionnaires were received back with consent approval to the share of their children in the study. Children express verbal approval to share in the study.

The epidemiological intraoral examination was conducted by three examiners under regular light in an indoor setting using, disposable mouth mirrors and a pen torch light.

The children were given a one-on-one interaction by the examiners, where data of either presence or absence of Incisal or Occlusal dental wear were collected.

Study data were analyzed using chi-square test, descriptive analysis is performed regarding parents responses to the questionnaire.

\*. The Chi-square statistic is significant at the .05 level.

**RESULT AND DISCUSSION:**

The high prevalence of Bruxism among children who did not use smart devices is less than that reported by Serra-Negra et al, 2010 (35.3%) in Brazil, and Insana et al, 2013 (36.8% in preschool and 49.6% in first grade students in USA. This difference could be attributed to different cultural atmosphere.

The percentage of Bruxism among smart device users reported in this study was found to be 59.2% which is significantly higher than that of non-users. It may indicate the effect of using smart devices on raising stress in children. This assumption can be supported by results of Anderson & Bushman, 2001 whom reported that children who play more video games were more likely to have increased aggression and less socially reactive. [figure1].

The present study found that the prevalence of Bruxism is significantly higher among children who owned a smart device recently (less than 2 years, 77.8%) by comparison to those who owned it for more than 2 years (35.8%). [figur 2].

Regarding frequency of using smart devices per week, the present study showed lower bruxing prevalence in children using it for 1 or 2 times per week (27.8%) compared to 74.4% in group using it more than 4 times/week. [Figure3]

Also, when comparing the time for using smart device with Bruxism it was found that children who used device for more than 5 hours had the highest Bruxism. [figure4]

This result is in accordance with Gentile, Lynch and Walsh, 2004 who reported that social isolation and less

academic achievement was seen in relation to time consumed of video games playing. Parents shared in present study also recognized the psychological effects like short temper and nightmares and isolation tendency in their children using smart devices. Also, Anderson and Bushman, 2001 concluded that most of the bad effects of video games are blamed on the violence they contain. And children who played more are more likely to have more aggression thoughts, feelings and behavior.

In the present study, there was a positive correlation between self-responded questionnaire reported by parent with Occlusal and Incisal wear, The prevalence of bruxism is higher among children who are reported to have crushing sound during sleep (76.1%) by comparison to those who are not reported to have crushing sound (45.86%). [figure5]

#### Conclusion

- The use of smart devices by children may be a cause of bruxism that lead to wearing of tooth structure.
- Effects of smart devices increased with prolonged use.
- Parents should be advised to decrease the time and frequency spent on videogames/smart devices and also to supervise the types of games to age appropriate games

#### Limitations and setbacks

The informed consent and questionnaire included a brief simple explanation of the aim and objective of the study they still feared the study and didn't fill the forms others didn't fill the questionnaire properly, we had to obtain the contact numbers to obtain their informed consent and then proceed to collect accurate information, and as a result we obtained additional valuable information's

- Absence of children during the examination day.
- Re visit the schools more than once to examine the remaining un examined students.
- Some children either lost or forgot their questioner at home so after examining them and obtaining their names we contacted each parent to obtain the needed information.

- Children where approached by examiners wearing lab coats which caused fear amongst some of them.

#### Recommendation

- Parents should have control on time consumed in using smart devices by their kids.
- Parents whom were aware of their children's bruxism habits should be informed about the importance of night guards

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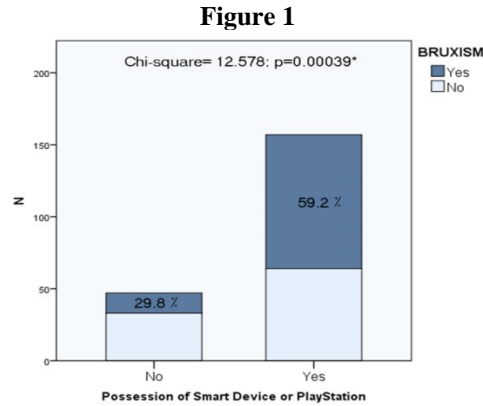


Table 1: Chi-square correlation between Bruxism and smart device or play station possession among children

Bruxism status	Smart device possession				Chi-square (p-value)
	Yes (N=157)		No (N=47)		
	Frequency	%	Frequency	%	
Positive	93	59.2	14	29.8	12.578 (.00039*)
Negative	64	40.8	33	70.2	

\* Statistically significant result (p-value<0.05); % percentage

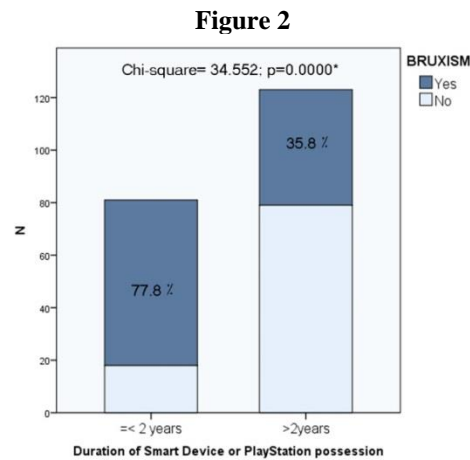


Table 2: Chi-square correlation between bruxism and duration of smart device or play station possession among children

Bruxism status	Duration of smart device possession				Chi-square (p-value)
	≤2 years (N=81)		>2 years (N=123)		
	Frequency	%	Frequency	%	
Positive	63	77.8	44	35.8	34.552 (.0000*)
Negative	18	22.2	79	64.2	

\* Statistically significant result (p-value<0.05); % percentage.

Figure 3

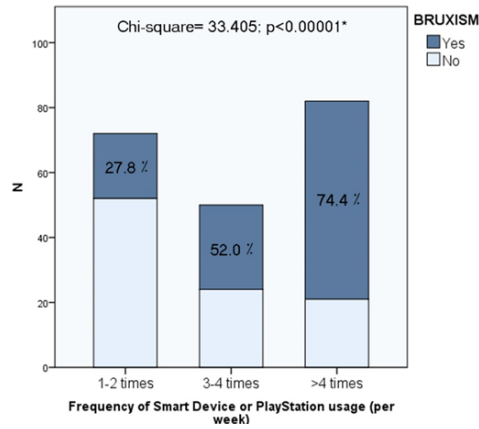


Table 3: Chi-square correlation between Bruxism and frequency of smart device or play station usage among children (Q4)

Bruxism status	Weekly frequency of smart device usage						Chi-square (p-value)
	1-2 (N=72)		3-4 (N=50)		>4 (N=82)		
	Freq	%	Freq	%	Freq	%	
Positive	20	27.8	26	52.0	61	74.4	33.405 (<.00001*)
Negative	52	72.2	24	48.0	21	25.6	

\* Statistically significant result (p-value<0.05); freq. frequency; % percentage.

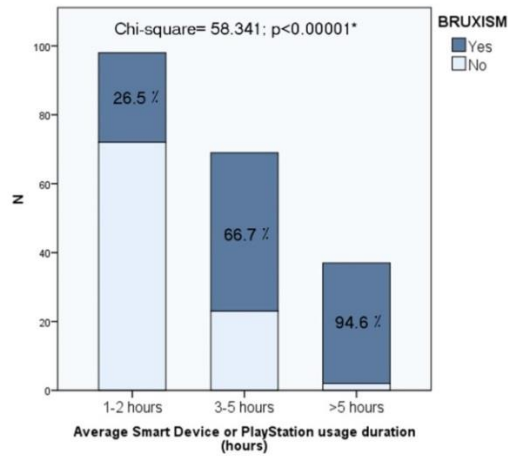


Figure4

Table 4: Chi-square correlation between bruxism and duration of smart device or play station usage among children (Q5)

Bruxism status	Duration of smart device usage						Chi-square (p-value)
	≤2 hours (N=98)		3-5 hours (N=69)		>5 hours (N=37)		
	Freq.	%	Freq.	%	Freq.	%	
Positive	26	26.5	46	66.7	35	94.6	58.341
Negative	72	73.5	23	33.3	2	5.4	(<.0001*)

\* Statistically significant result (p-value<0.05); freq. frequency; % percentage.

Figure 5

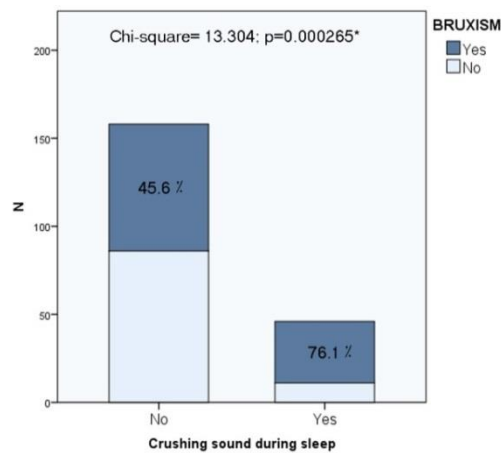


Table 5: Chi-square correlation between bruxism and crushing sound during sleep among children (Q6)

Bruxism status	Crushing sound during sleep				Chi-square (p-value)
	No (N=158)		Yes (N=46)		
	Frequency	%	Frequency	%	
Positive	72	45.6	35	76.1	13.304
Negative	86	54.4	11	23.9	(.000265*)

\*Statistically significant result (p-value<0.05); % percentage.