
Influence of Different Educational Syllabus on Occurrence of Bruxism In 4 To 9 Years Old Children in Chennai

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Abstract: Introduction: Bruxism is habitual involuntary grinding or clenching of teeth that is seen in both children and adults. Diurnal or nocturnal para-functional habit has also been called bruxism. The etiology of bruxism has remained controversial and some investigators believe that psychological factors may play a major role in promoting and perpetuating this habit. Aim of this study is to identify how educational system affects bruxism

Materials and methods: 250 students of different educational syllabi were randomly chosen and examined. Questionnaire was given to their respective parents to the bruxism in children

Result: Out of 250 children, 147 were studying in state government boards of education, 91 children studying in CBSE, and 12 children studying in montessori system. 60 out of 91 children studying CBSE, and 4 out of 12 children studying montessori system give a history of bruxism.

Conclusion: Children studying in CBSE and Montessori had less number of bruxers compared to those children in state board curriculum.

Keywords: Bruxism, diurnal, clenching, nocturnal, temporomandibular

INTRODUCTION

Development of sleep disorders can be associated with different etiological factors, such as local, systemic, psychological, occupational, and hereditary factors.^[1] Tooth wear is the most common symptom of such disorders and other associated symptoms are disorders of the supporting structures of the dental arches, hypersensitivity of pulpal tissue, mobility and pathological migration of teeth, fractured cusps and restorations, pain, temporomandibular joint disorder, hypertrophy of the masseter muscle and headaches(Berger *et al.*, 2017) Habitual clenching or grinding of teeth is known as bruxism, which occurs in both children and adults. Bruxism is also seen at times other than the most common nocturnal periods, and is mainly associated with factors like worry, stress, excitement etc., and is accompanied by a noticeable level of noise. Clinically both intra and extraoral examinations are useful in diagnosing bruxism. The three characteristics that must be observed in terms of the damage caused by the disease are the persistence of the habit, the intensity of the habit, and the duration of the periods of clenching or grinding.(Goyatá *et al.*, 2010)

Childhood bruxism may persist into adulthood. Preventive measures can be provided by early diagnosis, thereby limiting damage to the components of the masticatory unit and provide comfort to the individual.(Almilhatti *et al.*, 2010)

The etiological factors present themselves more often in children probably because they are more exposed to emotional problems, such as emotional tension, family problems, existential crises, anxiety, depression, fear and hostility, children in the self-assertion phase, school tests or even the practice of sports competitive and championships can act as factors of psychological and occupational origin to trigger this condition(Alóe *et al.*, 2003). Stress from restless and rigorous routines associated with anxiety has been the most studied emotional factor in children. These habits may influence the growth of the facial skeletal complex, causing damage to the muscles, periodontium, occlusion and adversely affecting the TMJ(Egermark-Eriksson, Ingervall and Carlsson,

1983). It is important that parents seek help as soon as the abnormality has been diagnosed. The participation of parents is fundamental as they can inform the medical history and current medical state of the child. Bruxism occurs most frequently during sleep and it is an activity characterized by tightening or clenching of the teeth. It may also be daytime bruxism, which is a semi-voluntary action performed by the child when the child is awake. Sleep bruxism is a harmful and unconscious activity with sound production, while the child is sleeping(Kojo *et al.*, 2006). Its etiology is diverse, and may be of local origin, systemic, psychological, hereditary, occupational, sleep disorders and parasomnias(Serra-Negra *et al.*, 2017)

In India, the school education system is governed by two major categories of educational boards recognised by the government of India. The first category includes the All-India Boards, like the CBSE (Central Board of Secondary Education), the CICSE (Council for the Indian School Certificate Examinations) and the National Open School(Havlinova and Schneidrova, 1995). The second category includes the State Level Boards that are authorised to carry on their activities within the states where they are registered. The education system in India is highly competitive because of a lack of an adequate number of good institutions to accommodate the ever-expanding population of children. Hence children face extensive competition at the entry level of pre-primary education, and thereafter at the end of every academic year, in the form of examinations that determine their promotion to the next grade. In classrooms teachers attempt to cover all the aspects of a challenging curriculum, often disregarding the comprehension level of students(Arslan, 2017)

At play schools, children are exposed to a vast variety of basic learning activities that help them to become independent faster and develop their self-help qualities like eating food themselves, dressing up, and maintaining cleanliness(Cash, 1988). The age limit for admission into pre-school is 2 to 3 years. Nursery level activities help children unravel their talents, thus enabling them to sharpen their mental and physical abilities. The age limit for admission in nursery is 3 to 4 years(Serra-Negra *et al.*, 2010) LKG, it is also called the Junior Kindergarten (Jr. kg) stage. The age limit for admission in LKG is 4 to 5 years. UKG, it is also called the Senior Kindergarten (Sr. kg) stage. The age limit for admission in UKG is 5 to 6 years.

LKG and UKG stages prepare and help children emotionally, mentally, socially and physically to grasp knowledge easily in order to aid the children in the later stages of school and college life(Nunes, 2003). A systematic process of preschool education is followed in India to impart knowledge in the best possible way for the betterment of the young leaders of tomorrow. By following an easy and interesting curriculum, teachers strive to make the entire learning process enjoyable as well as fruitful for the children. To a certain extent even the employment status of the parent also plays a major deciding and aggravating factor in the occurrence of bruxism habit in the children.(Deepa G *et al.*, 2021)

Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J *et al.*, 2018; Menon *et al.*, 2018; Prabakar *et al.*, 2018; Rajeshkumar *et al.*, 2018, 2019; Vishnu Prasad *et al.*, 2018; Wahab *et al.*, 2018; Dua *et al.*, 2019; Duraisamy *et al.*, 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran *et al.*, 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma *et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi *et al.*, 2020; Samuel, Acharya and Rao, 2020). The aim of this study was to identify whether the education system influences the occurrence of bruxism in children.

MATERIALS AND METHOD

The study was conducted with the ethical standards of the Institute and was approved by the scientific review board of Saveetha Dental College and Hospitals.

The present study involved a total of 250 participants among 4-9 years old children from schools with different education syllabi in Chennai over a period of 3 months from November 2018 to January 2019. The survey was carried within the premises of their respective schools. The estimated sample size was 250. This survey consisted of 24 questions regarding the education syllabus of the children and their bruxism habits. The questionnaires consisted of a set of standardized questions regarding a comprehensive history of the children and the questionnaires were randomly distributed to the parents of the children of age 4-9 years in order to eliminate any bias. The questionnaires were primarily aimed to assess the knowledge of the parent about bruxism and the relation with the school education syllabus. The questionnaire included two main sections. The first part contained the demographic information about the children while the second part contained questions regarding school syllabus and activities in school.

A total of 250 questionnaires were filled and data was collected using paper and pen method. The inclusion criteria for the study was children within the age group of 4-9 0years of age , with no mental disability. There was no segregation of the participants who took part in the study, as this would result in sampling bias.

The details of the questionnaire is given down below. The answers were marked based on the current status of the children. The data was then tabulated and reviewed by an external reviewer and screened for internal validity of the study. The data was then exported to SPSS Software by IBM Version 20 for Statistical Analysis.

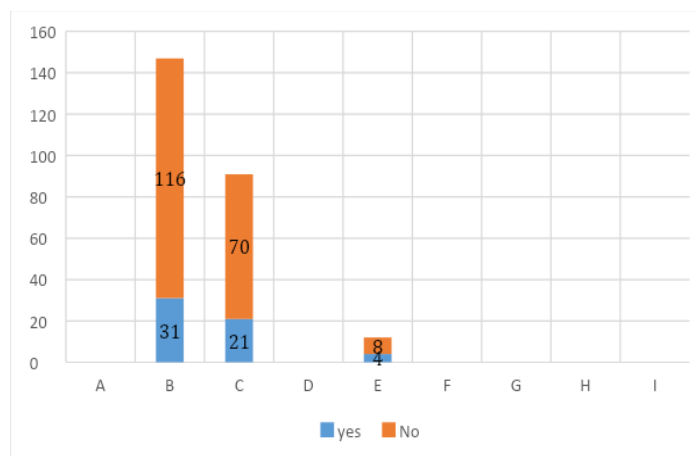
Descriptive statistics was performed followed by Correlation tests to see any kind of correlation or Association between the different variables taken in the present study.

RESULT

Table 1: shows the percentage of children with bruxism and the related questions

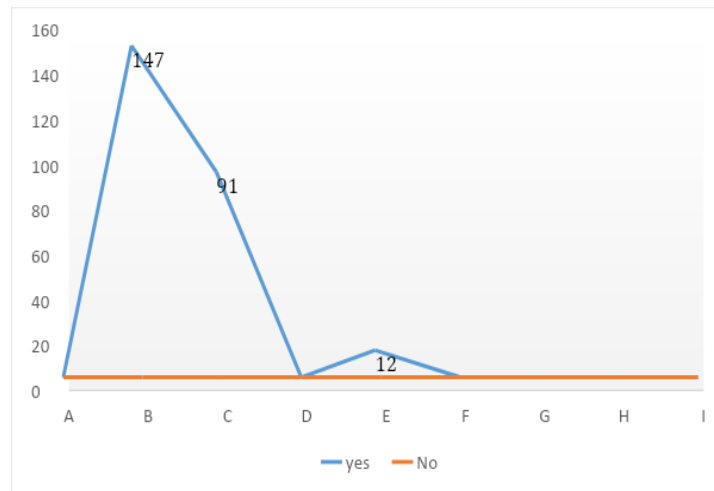
QUESTION	YES	NO
A total of 250 parents, aged between 23 and 37 years (mean of 30 years) participated in the present study. The age of the children ranged from 4 to 9 years with a mean age of 6.5 years.		
Does your child have habit of clenching/ grinding?	55	195
If yes, when does he/she grind their teeth? (A) 0% (B)6% (C)16% (D)76%		
If yes have you noticed any worn out appearance of teeth?	55	195
Have you ever noticed flattened teeth in your children’s mouth?	15	235
If yes, which tooth is affected the most? (A) 2% (B) 4% (C) 2% (D) 92%		
Does your child complain any discomfort in the jaw?	30	220
Does your child complain of aching temples upon awakening?	20	230
Does your child complain of tightness or soreness of the jaws upon awakening?	10	240
Does your child complain difficulty in opening the mouth after waking up?	25	225
Have you heard of felt joint clicks in your child's jaw after he/she wakes up?	0	250

Graph 1 shows relation between the education system and bruxism



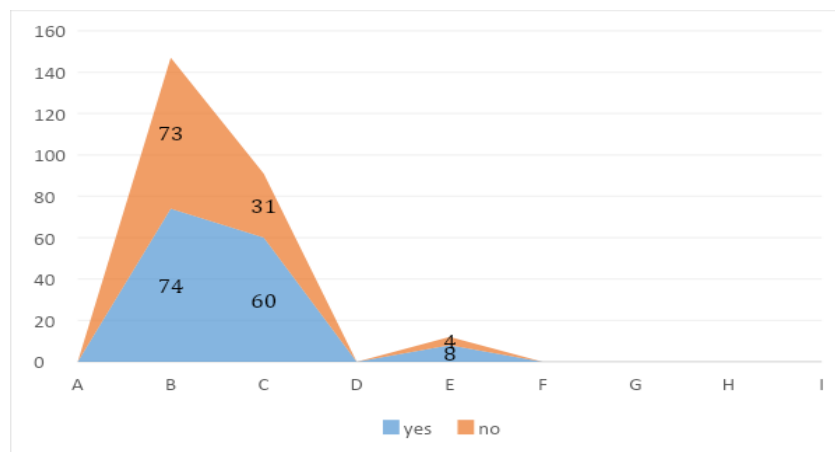
Graph 1: The above graph distribution depicts that out of 250 children, 147 are studying in state government boards of education, 91 children studying in CBSE, and 12 children studying in montessori system.

Graph 2 shows relation between the education system and the knowledge on dentition



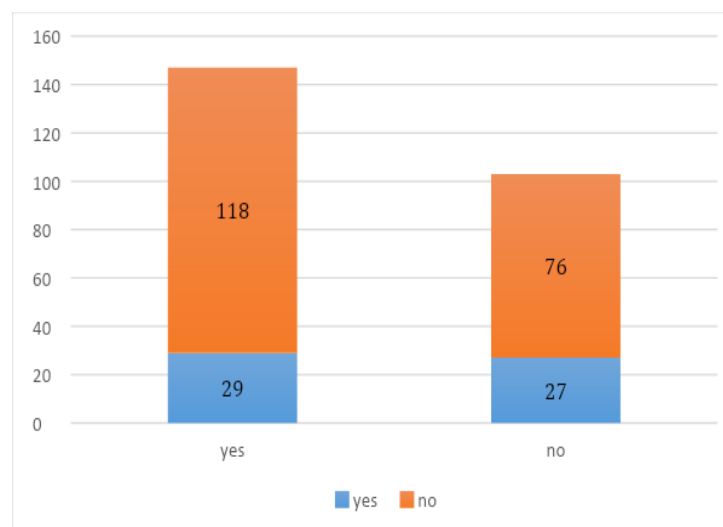
Graph 2 reveals 147 children from the state government, 91 children from CBSE and 12 students from montessori have education syllabus regarding dentition.

Graph 3 shows relation between the education system and the level of stress



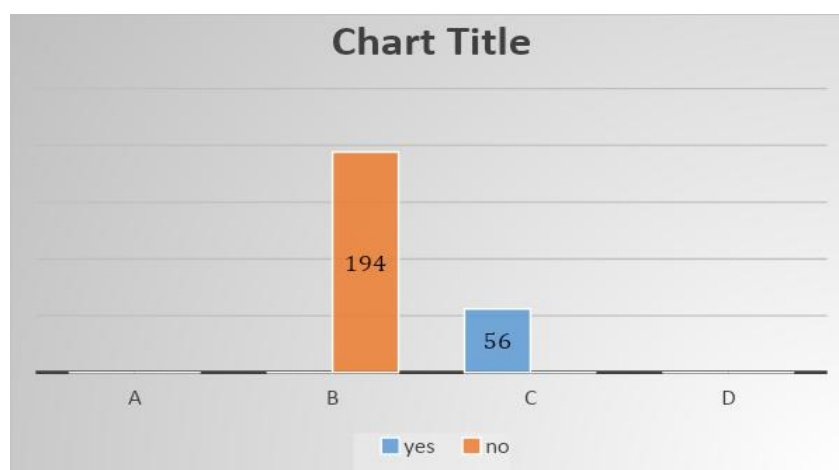
Graph 3 reveals 74 children from the state government board, 60 children from CBSE and 8 students from montessori are getting stressed out because of the education system

Graph 4 shows relation between children who has bruxism and level of stress in school



Graph 4 reveals 29 children who has bruxism complains about school, and 27 children who have bruxism does not complains about school.

Graph 5 shows relation between bruxism and academic performance of children



Graph 5 The graph distribution depicts that 56 children with bruxism had an average academic performance while 194 children without bruxism exhibited good academic performance.

The results obtained from the survey revealed that out of 250 children whose parents took part in the survey, 147 children from the state government, 91 children from CBSE and 12 students from montessori, 74 out of 147 children who are studying in state government boards of education, 60 out of 91 children studying CBSE, and 4 out of 12 children studying montessori system give a history of bruxism. All of the students who took part in the study have a curriculum consisting of information regarding the dentition, hence amount to the fact that all the students have some awareness about teeth and the oral cavity. It is also observed that 55 children from the state government board, 60 children from CBSE and 8 students from Montessori are subjected to stress because of the education system. Out of this, 29 children who have bruxism give reasons that direct the attention to the school, and 27 children who have bruxism give conflicting reasons which are not directed to the school or educational system. 56 children with bruxism had an average academic performance while 194 children without bruxism showed good academic performance.

DISCUSSION

In the present study the association between bruxism and education syllabi is evaluated from the questionnaire answered by parents of school going children of age ranging from 4 to 9 years.

It was found that there was no statistically significant association between education syllabus and bruxism. The results obtained from the survey revealed that children who were studying Montessori and CBSE education syllabus exhibited lower amount of tooth wear from bruxism than children studying in state board government syllabus. High levels of stress was encountered more frequently among the children studying in state board when compared to CBSE and Montessori while the reason for low stress levels in these education systems can be attributed to the use of activity based learning and creative reasoning.

Findings from a study by Bader et al.(Bader *et al.*, 1997) pointed out that, chronic bruxers had statistically significantly higher values at the somatic anxiety scale, and lower values at the socialization scale, which means that bruxers were more anxiety prone, succumb to pressure, and more vulnerable to psychosomatic disorders. From the present study it was concluded that the children studying in the state board schools are prone to much higher levels of anxiety and stress when compared to the other educational systems due to the lack of activity based learning and extensive focus on book based learning commanding the need for memory based recalling.

According to a study conducted by Nihan Arslan(Arslan, 2017) high emotional self efficacy decreases educational stress, however this emotional self efficacy cannot be expected in children of the age group that has been considered in the present study. Emotional self efficacy decreases vulnerability against stress and other similar conditions, therefore more awareness programmes should be conducted to enhance the emotional self efficacy of individuals in all age groups thereby increasing their coping mechanisms with stress and reducing the incidence of bruxism.

In a study conducted by Daniel Frías Lasserre et al(Frías-Lasserre, Villagra and Guerrero-Bosagna, 2018), Inadequate learning environments may affect epigenetic marks involved in developmental processes, leading to brain changes. Based on current evidence from epigenetic studies, these stress factors and unhealthy environments may alter the formation of neural circuits, affecting the acquisition of abilities linked to learning(Deepa G *et al.*, 2021). Thus with the present study indicating the level of stress with different education systems, the same has to be altered to produce a positive effect on the emotional health of an individual growing up in this society.

An authoritarian principal who backs the demanding requirements of the traditional education system may cause a climate of mistrust and fear, anxiety and psychosomatic troubles in the pupils and in teachers as well and learning and behaviour disorders in the pupils. The negative experience endangers healthy development of school population according to Halvinova et al (Halvinova and Schneidrova, 1995) From the present study as it is evident that the levels of stress are varied among the education systems, these factors are to be minimised through various exercises to improve the overall outcome if the same.

On the other hand, Restrepo et al., in a study among 3 to 6 year-old children, using Conner's questionnaires, found that bruxism levels and anxiety symptoms (using CTRS and CPRS tests) reduced after a six month application of psychological techniques, which showed a correlation between bruxism and anxiety disorders in this age group. (Pierce et al., 1995). Different findings may be the result of different age groups evaluated, sample size, and bruxism diagnostic criteria.

In a study conducted by Bahman Seraj et al in Tehran, 3.7% of the study population exhibited TMD whereas in the present study the maximum possible TMD that would be observed was 12%. This goes to show that the effects of bruxism on TMJ disorders is more prevalent in the Indian population when compared to other countries. However studies done by Widmalm (Widmalm et al., 1995), Restrepo (Restrepo et al., 2008) and Winocur (Winocur et al., 2001) but Cheifetz (Cheifetz et al., 2005) found no significant relationship between TMD and bruxism and hence further studies are to be done to confirm the correlation and precautions about the same can be taken in years to come.

Studies by various authors (Serra-Negra et al., 2014; Soares et al., 2017; Câmara-Souza, de Figueredo and Rodrigues Garcia, 2019) have shown a positive correlation between stress and bruxism, however these are studies which have been carried out in an older age group. From the present study it is evident that school going children undergo varied amounts of stress with the different education syllabi that are subjected to. The present study has not shown a correlation between the syllabus and bruxism, however varied amounts of stress are evident thus further studies are to be done to confirm the correlation between stress and bruxism in a younger population as that of the present study.

CONCLUSION

From this research, we can conclude that children studying in CBSE and Montessori had less number of bruxers compared to those children in state board curriculum. This can be attributed to the implementation of activity based learning, creative reasoning, high order thinking scenarios, multiple choice questions and model learning in the education system.

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