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Association of Dietary Habits and Parental Reported Sleep Tooth Grinding Among Children in Chennai-A Questionnaire Study

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ABSTRACT

Sleep bruxism (SB) is an oral parafunction characterized by grinding or clenching of the teeth during sleep that is associated with an excessive or intense sleep arousal activity. Bruxism gradually reduces with increase in age. Tooth wear can occur due to various potential factors, among which sleep tooth grinding and dietary habits is one of the factors. The consumption of fruits and vegetables, sweets and chocolates, milk and milk products are related to sleep bruxism. The aim of the study is to associate the dietary habits and parental-reported sleep tooth grinding with tooth wear in children with mixed dentition in chennai. The questionnaire comprised 15 questions which were used to detect the association of dietary habits in children with bruxism. The questionnaire was uploaded on to an online survey platform and results were analysed using SPSS software. Results show that 27.9% children consuming bread and cereals regularly have found to have a habit of clenching teeth, 32.56% children consuming sweet and sugary food regularly clench their teeth and 20.93% children having fizzy drinks once a week have a habit of clenching teeth. Within the limits of the study, it is seen that children consuming bread and cereals, sweet and sugary food, soft/fizzy drinks have a higher incidence of sleep bruxism.

Key words: Sleep tooth grinding, Bruxism, Dietary habits, Children

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INTRODUCTION

Tooth wear is defined as "loss of the tooth substance by chemical or mechanical processes". During childhood, tooth wear increases with age [1], until reaching a prevalence of 80% by the end of the primary dentition [1,2] whilst decreasing to about 30% in adolescents with permanent dentition [1]. Sleep bruxism (SB) is "an oral parafunction characterized by grinding or clenching of the teeth during sleep that is associated with an excessive or intense sleep arousal activity [3]." SB is regarded as the most frequent parasomnias encountered by children [4]. The etiology of SB is complex and multifactorial demanding nutritional, systemic, psychological, occupational, and genetic factors. Recurrent provocation during sleep, which is associated with increased anxiety and stress, is regarded as the main cause of poor sleep quality [5]. SB in young children can also be associated with fatigue of the masticatory musculature, headaches, and noisy breathing during sleep [6,7].

Wear of the teeth in children is the result of combined progression of erosion, attrition, and abrasion [8]. Erosion is usually associated with intrinsic or extrinsic acids. This can be seen in children who tend to consume large quantities of sweets, non-natural juices, citric fruits, and highly carbonated drinks. This leads to more risk of developing tooth erosion [9]. However attrition is more prevalent in subjects with grinding-type bruxism habits, whilst abrasion occurs due to the wearing action of an external object like toothbrush [8]. When an acid environment is present, there is an increased risk of having all types of tooth wear. Due to

its multifactorial etiology, tooth wear should be assessed with various factors, including an evaluation of possible conditions, such as dietary habits, soft-drink intake [10], and oral habits like tooth grinding [11,12].

Our department is passionate about child care, we have published numerous high quality articles in this domain over the past 3 years [13-31]. With this inspiration we planned to pursue research on the association of dietary habits and parental-reported sleep tooth grinding with tooth wear in children with mixed dentition in Chennai.

MATERIALS AND METHODS

The questionnaire-based study was carried out among Parents with children between the ages of 1-17 years. The questionnaire comprised 15 questions which were used to detect the sleep association of dietary habits and sleep bruxism. The questionnaire was prepared and approved by the scientific review board of the institution. The questionnaire was uploaded on to an online survey platform (google forms) and the link was shared to the parents. The questionnaire was just a screening questionnaire and cannot be used for diagnostic purposes.

Part 1 of the questionnaire was developed to include questions about the child's age and sex of the child.

Part 2 of the questionnaire was developed to include questions about tooth grinding in sleep and various dietary habits of the child.

Part 3 of the questionnaire was concerned with presence of adverse oral habits in children, the awareness of the parents about the association of dietary habits with tooth grinding as well as presence of various treatments for the sleep bruxism. Based on the responses from the subjects, the statistics were done and the results were obtained in a systematic manner. The statistics was carried out using the IBM SPSS software.

RESULTS AND DISCUSSIONS

The total number of responses were 80, the age of the participants ranged from 1 to 17 years. The highest number of participants were from the age group 5-8 years with 50% as shown in Figure 1 and almost 62.79% participants were females (Figure 2).

This questionnaire based study assessed the relationship of parental-report STG and dietary habits with tooth wear in children with a mixed dentition. To test the association, parents were requested to complete a questionnaire regarding prevalence of bruxism, and various dietary habits were correlated with presence of tooth grinding. Figure 3 shows response of the parents to the child consuming breads and cereals in their diet and its association to presence of clenching of his/her teeth at night. 27.9% children consuming bread and cereals regularly are found to have a habit of clenching teeth and 4.7% children who don't consume bread and cereals have found to have a habit of clenching teeth. Figure 4 shows response of parents to the child consuming milk and milk products in diet

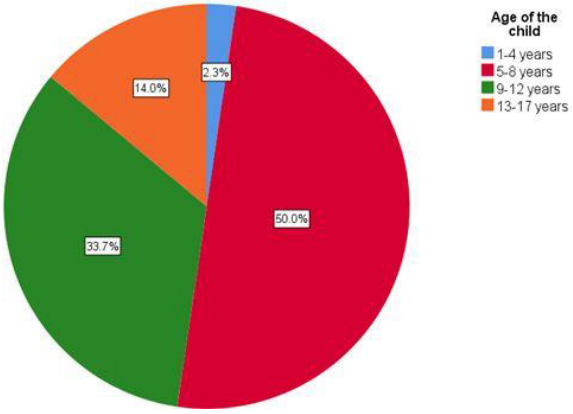

Figure 1: Pie chart showing age of the child in this study (Red represents 1-4 years, green represents 5-8 years, orange represents 9-12 years, and blue represents 13-15 years). The highest number of participants was from the age group 5-8 years with 50%.

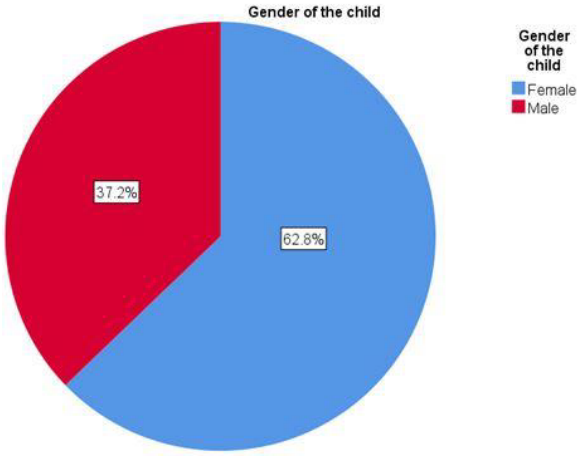

Figure 2: Pie chart showing gender of the child in this study (Red represents male participants and blue represents female participants). The highest number of participants was from females with 62.79%.

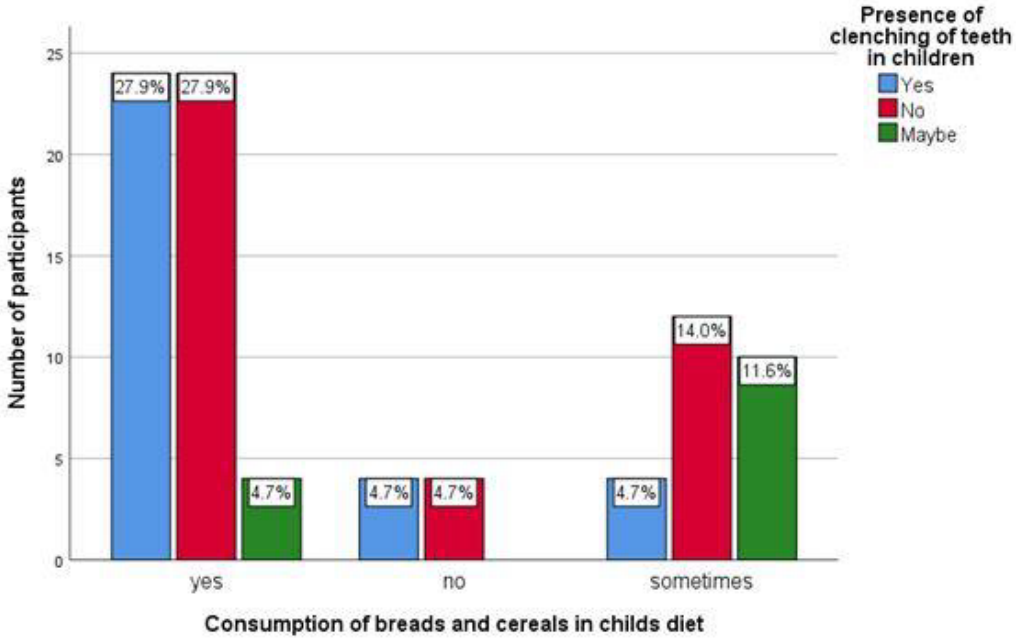

Figure 3: Bar graph showing response to the child consuming breads and cereals in their diet and its association to presence of clenching of his/her teeth at night (Blue graph depicts yes, red- no, green- maybe). X axis shows response to consumption of breads and cereals in diet and Y axis shows number of participants. 27.9% children consuming bread and cereals regularly have found to have a habit of clenching teeth. However this was statistically significant (Pearson's chi square test; p value=0.00-significant).

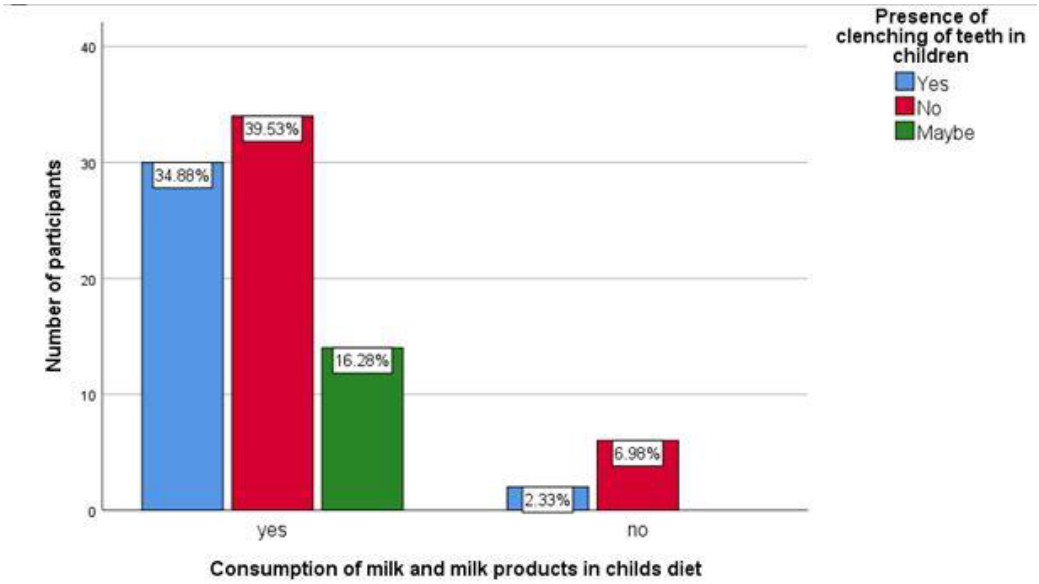

Figure 4: Bar graph showing response to the child consuming milk and milk products in their diet and its association to presence of clenching of his/her teeth at night (Blue graph depicts yes, red- no, green-maybe). X axis shows response to consumption of milk and milk products in diet and Y axis shows number of participants. 39.53% children consuming milk and milk products regularly do not have a habit of clenching teeth and 34.88% have a habit of clenching teeth. However this was statistically significant (Pearson's chi square test; p value=0.00-significant).

and it is seen that 39.53% children consuming milk and milk products regularly do not have a habit of clenching teeth and 34.88% children have a habit of clenching teeth. Figure 5 shows response of the parents to the child consuming sweet and sugary foods in their diet and its association to presence of clenching of his/ her teeth at night , 32.56% children consuming sweet and sugary food regularly have a habit of clenching teeth. According to Figure 6 it is seen that 20.93% children having fizzy drinks once a week have a habit of clenching teeth. Only 4.65% of children having fizzy drinks more than 3 times a week show clenching of teeth. Figure 7 shows response to the child having fruits and vegetables in their diet and its association to presence of clenching of his/her teeth at night. 23.26% children having fruits and vegetables

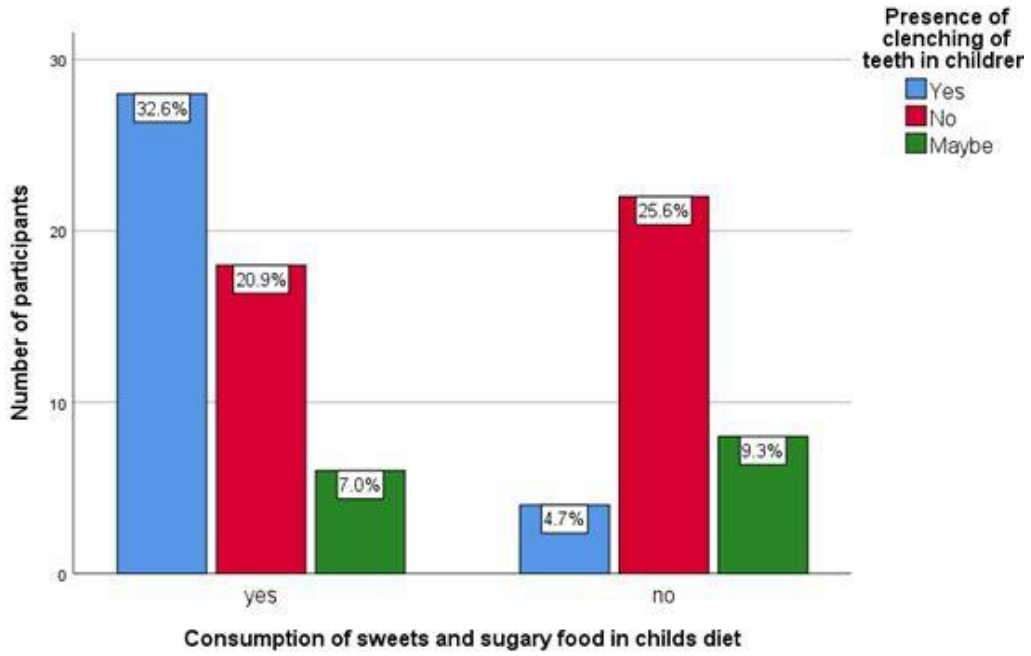

Figure 5: Bar graph showing response to the child consuming sweet and sugary in their diet and its association to presence of clenching of his/her teeth at night (Blue graph depicts yes, red- no, green-maybe). X axis shows response to consumption of sweet and sugary food in diet and Y axis shows number of participants. 32.56% children consuming sweet and sugary food regularly have a habit of clenching teeth. However this was statistically significant (Pearson's chi square test; p value=0.00-significant).

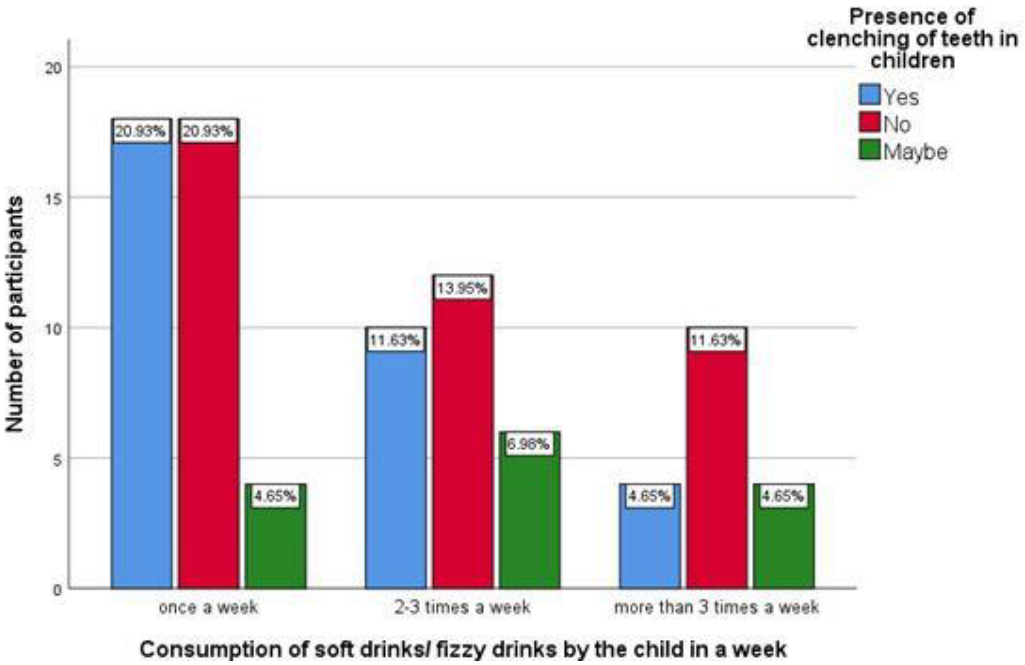

Figure 6: Bar graph showing response to the child having fizzy drinks in their diet and its association to presence of clenching of his/her teeth at night (Blue graph depicts yes, red- no, green- maybe). X axis shows response to consumption of fizzy drinks in diet once a week, 2-3 times a week, and more than 3 times a week and Y axis shows number of participants. 20.93% children having fizzy drinks once a week have a habit of clenching teeth. Only 4.65% of children having fizzy drinks more than 3 times a week show clenching of teeth. However this was statistically significant (Pearson's chi square test; p value=0.00-significant).

once a week do not have a habit of clenching teeth. Only 16.28% of children having fruits and vegetables 2-3 times a week show clenching of teeth.

Figure 8 depicts the response of parents regarding the presence of any abnormal oral habits in the children. It is seen that according to the parents, 48.84% of children have the presence of abnormal oral habits. Children have various adverse oral habits as they grow up. Figure 9 shows the distribution of various

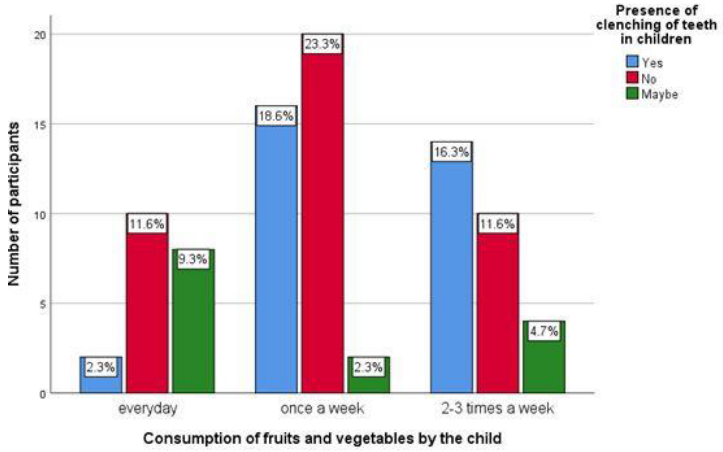

Figure 7: Bar graph showing response to the child having fruits and vegetables in their diet and its association to presence of clenching of his/her teeth at night (Blue graph depicts yes, red-no, green-maybe). X axis shows response to consumption of fruits and vegetables in diet 2-3 times a week, every day and once a week and Y axis shows number of participants. 23.26% children having fruits and vegetables once a week do not have a habit of clenching teeth. Only 16.28% of children having fruits and vegetables 2-3 times a week show clenching of teeth. However this was statistically significant (Pearson's chi square test; p value=0.00-significant).

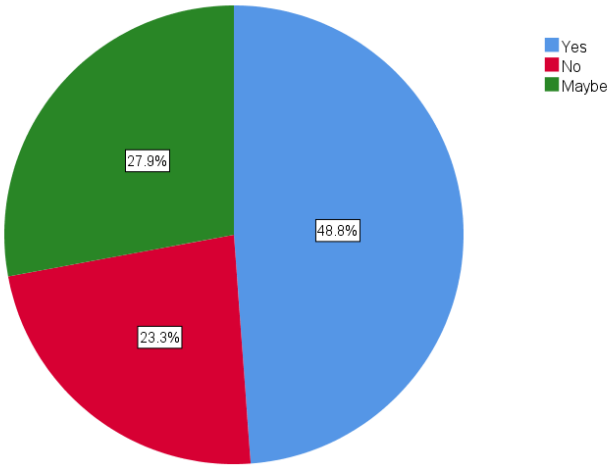

Figure 8: Pie chart showing response of parents regarding presence of any abnormal oral habits in the children (red represents no, green represents maybe, and blue represents yes). 48.84% of children have the presence of abnormal oral habits.

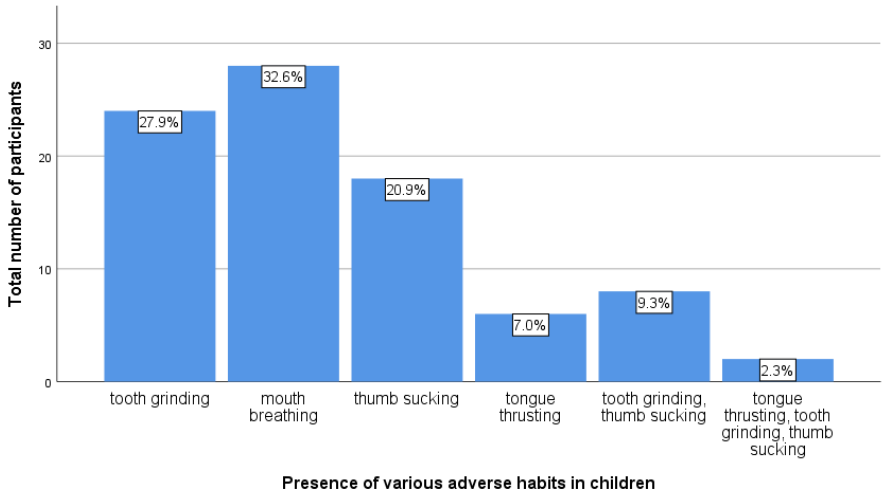

Figure 9: Bar graph showing presence of various adverse oral habits in the children such as mouth breathing, thumb sucking, and tongue thrusting and tooth grinding. X axis represents various adverse oral habits and Y axis represents total number of participants. 27.9% of children have a habit of tooth grinding.

adverse oral habits in the children such as mouth breathing, thumb sucking, tongue thrusting and tooth grinding. It is seen that 27.9% of children have a habit of tooth grinding. Majority of children have mouth breathing habits more commonly (32.6%). Figure 10 shows response of parents regarding relation between sleep bruxism and dietary habits, 51.16% of parents believed that sleep bruxism may have a relation with the dietary habits of children. Parents are not well aware of the various treatment options for bruxism and almost 72.09% of parents were not aware of treatments done for children with sleep bruxism as shown in Figure 11.

Tooth wear can occur due to various potential factors, among which sleep tooth grinding and dietary habits is one of the factors. Unfortunately, there are limited reports on the effects of parental-report sleep tooth grinding and dietary habits, especially in children [11,32,33]. Overall, the findings show that Parental-report STG is not completely associated with tooth wear in the mixed dentition. The consumption of fruits and vegetables, sweets and chocolates, milk and milk products were found to be correlated with tooth wear patterns, but the correlation values are considered weak. Previous studies showed a positive association of parental-report STG and tooth wear in the mixed and permanent dentitions among children [11,32,33]. Regarding the dietary habits, previous investigations were done to assess the risk factors for tooth wear in the primary, mixed, and permanent dentitions and found a positive association with the consumption of soft drinks, non-natural juices, citrus flavored sweets/gums, and citrus fruits [9,34]. It is seen that there is some amount of wear of permanent molars and deciduous canines in children with consumption

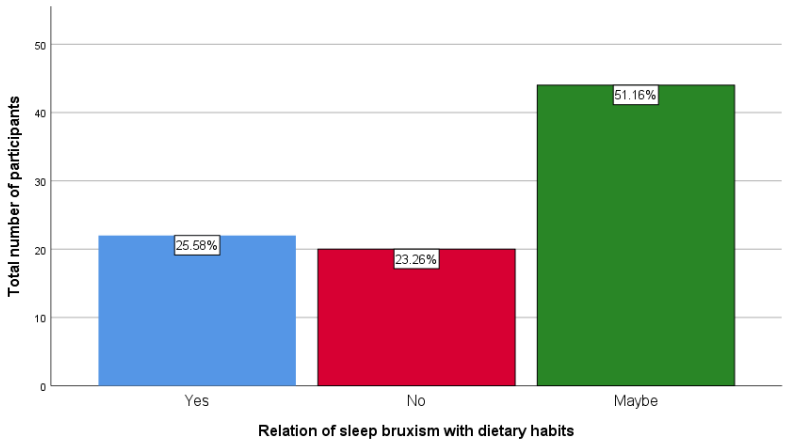

Figure 10: Bar graph showing response of parents regarding relation between sleep bruxism and dietary habits (red represents no, green represents maybe, and blue represents yes). X axis represents the response of parents regarding the relation between sleep bruxism and dietary habits and Y axis represents total number of participants. 51.16% of parents believe that sleep bruxism may have a relation with the dietary habits of children.

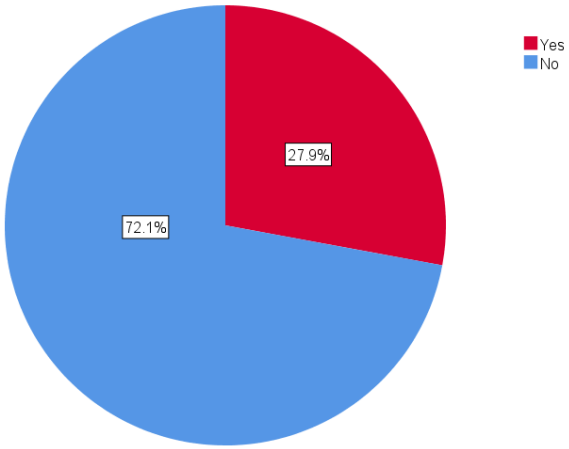

Figure 11: Pie chart showing response of parents regarding awareness of various treatments for sleep bruxism (red represents no, and blue represents yes). 72.09% of parents are not aware of treatments done for children with sleep bruxism.

of fruits and vegetables, sodas, and sweets and chocolates. According to the study by Restrepo et al. [35] increase in the consumption of fruits and vegetables has a clinical influence on the increasing severity of occlusal wear of teeth 16, 36 and 64, while sweets and chocolates have the same effect on the severity of wear of 16. Age has to be taken into account as an important cofactor when designing investigations on the etiology of tooth wear in the different dentitions and association with dietary habits [34].

One of the factors to be considered is the presence of mixed dentition, since the teeth eruption time is different among individuals and that plays a key role in such studies. This must be considered as a study limitation, since the time the teeth erupted and stood in the mouth cavity can show the variations in exposure to attrition, abrasion and erosion [35]. It is noted that sociodemographic factors and cultural practices influence dietary habits and their effects on tooth wear [36]. According to a study by Suwa et al. [37] eating a snack after dinner every day was found to be a significant risk factor for severe bruxism. This finding may indicate that sleep bruxism is independently associated with dietary factors. However additional research is needed to confirm any connection between dietary habits and bruxism.

CONCLUSION

Within the limits of the study it is conclusive that dietary habits can be related to parental reported sleep tooth grinding. In our study it is seen that children consuming bread and cereals, sweet and sugary food, soft/fizzy drinks have a higher incidence of sleep bruxism. However additional research is needed to confirm any connection between dietary habits and bruxism.

ACKNOWLEDGEMENT

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CONFLICT OF INTEREST

There are no conflicts of interest as declared by the authors.

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