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Evaluation And Impact Of Deleterious Oral Habits On Dental Caries Among 6 - 10 Years Old Children.

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Abstract

Introduction: Deleterious oral habits in children, such as thumb sucking, nail biting, and prolonged pacifier use, can adversely affect the stomatognathic system, leading to malocclusions, intraoral defects, and increased susceptibility to dental caries. This study aims to investigate the relationship between these habits and the development of dental caries in children aged 6-10 years, while also exploring the role of guardians and healthcare providers in implementing effective interventions.

Methodology: A cross-sectional study was conducted involving 211 children, aged 6-10 years, subjected with no severe systemic illness and comprising mixed dentition were selected from the outpatient department of M.A. Rangoonwala Dental College and its satellite centers. A close-ended questionnaire comprising 21 questions was filled by parents to gather demographic details, oral hygiene practices, and the presence of deleterious oral habits. Clinical examinations were performed to

assess dental caries using the deft (decayed, extracted, filled primary teeth) and DMFT (decayed, missing, filled permanent teeth) indices.

Results: The study revealed that 37% of children with dental caries exhibited no oral habits, while thumb sucking (16.5%) was the most prevalent habit, followed by nail biting (10.4%). The analysis indicated that children with oral habits had significantly higher mean deft scores (5.43 for thumb sucking) compared to those without habits (1.91). The mean DMFT score was also elevated among children with habits, particularly in those who engaged in thumb sucking and mouth breathing. The findings suggest a strong correlation between deleterious oral habits and increased dental caries prevalence.

Conclusion: The study reported the significant impact of deleterious oral habits on dental health in children, highlighting the need for targeted interventions and comprehensive oral health education. Early identification and management of these habits are important in preventing dental caries and promoting overall oral health.

Keywords: Deleterious oral habits, Children, Thumb sucking, Nail biting, Mouth breathing.

Introduction

Deleterious oral habits, such as thumb sucking, nail biting, and prolonged pacifier use, can significantly impact the functions of the stomatognathic system, due to which they lead to malocclusions, intraoral defects, and deformities in surrounding tissues if not addressed early in childhood. Beyond their physical implications, these habits can also contribute to poor oral hygiene practices, which are closely linked to the development of dental caries. Children who engage in deleterious habits often exhibit inadequate oral hygiene, increasing their susceptibility to dental caries due to plaque accumulation and bacterial growth [1,14].

Dental caries is an infectious microbiological disease of the teeth that results in localized dissolution and destruction of calcified tissues [Sturdevant]. It is often exacerbated by deleterious habits, can lead to plaque buildup, which is a significant contributor to caries development. The relationship between deleterious oral habits and dental caries is multifaceted; for instance, children with nonnutritive sucking [of the thumb, pacifier, and lips] and the habit of nail biting as well as grinding of the teeth and mouth breathing may have a higher prevalence of dental caries due to their tendency to neglect proper oral hygiene practices [1]. Furthermore, the persistence of these habits can create areas that are difficult to clean, further promoting plaque accumulation and increasing the risk of caries [2].

In addition to physical discomfort and pain, dental caries in childhood can have psychological and social implications. Dental pain and sensitivity can interfere with essential activities such as eating and speaking, while visible dental issues may affect a child's self-esteem and social interactions [3]. Addressing these early habits is not solely about preventing cavities; it involves promoting a holistic approach to health that encompasses physical, mental, and social well-being.

To summarise the interplay between deleterious oral habits and dental caries underscores the need for comprehensive oral health education and preventive strategies.

So this study was planned with the aim to understand how these habits contribute to the development of dental caries, and how guardians and healthcare providers can implement effective interventions

that promote healthier oral practices in children, ultimately leading to improved oral health and well-being.

METHODOLOGY:

A cross sectional study was conducted to assess the evaluation and Impact of deleterious oral habits over dental caries among 6-10year old children. The participants were selected from M.A. Rangoonwala dental college OPD and its satellite centre, who satisfied the inclusion criteria. A total 211 children were included in the present study. Before commencing the study informed consent was obtained from the parents or legal guardian of the children. Inclusion criteria for participant's encompassed children aged 6-10year had no severe systemic illness, ensuring the study was focused on generally healthy children and subject with mixed dentition. Exclusion criteria included children outside the age range, children with special needs or disabilities, children with severe medical conditions, children who have undergone orthodontic treatment at the time of study or previously, children with congenital or acquired deformities (syndromic and cleft) and children whose parents refused their participation in the study.

The purpose of the survey was informed and explained to the participants and those parents voluntarily agreed to participate in the survey were asked to fill the questionnaire and also the oral health examination was carried out by the experienced examiner.

An close ended questionnaire was made which includes 21 questions to collect information regarding their demographic detail, child's oral hygiene, presence of deleterious oral habit or not and parental influence on oral health habits. Aiming to provide a comprehensive view of factors potentially influencing caries. The clinical examination conducted by an examiner to evaluate dental caries and effect of deleterious oral habits like crowding, protrusion, open bite, cross bite etc. The deft index (decayed, extracted and filled primary teeth) and dmft(decayed, missing, filled permanent teeth) was documented for each participant. Following data collection, the obtained data were entered into computerized data base for analysis. Appropriate statistical software was employed to performed analysis.

Pilot study was conducted among 30 children to check the reliability of the questionnaire and sample size estimation which gave us crohn back alpha = 0.8 with the sample size of 210 to 220.

Result

The study population consisted of 211 children with a mean age of 8.08 ± 1.55 years. The gender distribution included 112 males and 99 females. Regarding their medical history related to oral habits, 211 children reported no medical history. The dental history analysis revealed that 176 children had no relevant dental history, 18 had undergone extractions, and 16 had received dental restorations. None of the children presented with congenital or acquired deformities. The study revealed that 162 children (76.8%) brushed their teeth once a day, while 49 children (23.2%) brushed twice a day. Regarding brushing techniques, 136 children (64.5%) used the horizontal technique, 46 children (21.8%) used the vertical technique, and 29 children (13.7%) used the circular technique.

The analysis of oral habits revealed that among the participants, largest group (37%) exhibited no oral habits. Among the specific oral habits, Thumb sucking 16.5% (35) was the most common oral habit, followed by Nail biting 10.4% (22) and Tongue thrusting 9.0% (19). Lip biting 7.5% (16), Mouth

breathing 7.5% (16), and Pencil biting 7.1% (15) showed similar distribution, while Other habits 5.2% (11) was the least common., indicating a diverse range of oral habits in the study population.. Regarding the duration of these habits, the majority of children (45.11%) engaged in oral habits for 6 months to 1 year, followed by 32.33% who maintained these habits for 1 to 3 years. A smaller proportion exhibited longer durations of more than 3 years (16.54%), while only a minimal number (6.02%) reported habits lasting less than 6 months, indicating that most children in the study maintained their oral habits for an intermediate duration. The analysis further showed that 68 children (32.2%) engaged in habits many times throughout the day, 63 children (29.9%) exhibited occasional habits, and 2 children (0.9%) performed habits a few times a day. Boredom was the primary trigger (55.5%), followed by stress/anxiety (2.8%) and fatigue (2.4%). Most children reported no environmental factors affecting their habits (62.1%), no medical issues (63.0%), and no professional evaluation (63.0%). While 33.2% reported no interference with daily activities, regarding social interactions, 62.1% experienced no effect and 0.9% reported minor effects.

Table 1 Habitual Behavior Patterns

Category	Percentage (%)
No attempt to stop habits	63.0%
Punishment/scolding	62.6%
Habits during boredom	54.0%
Cooperative to intervention	53.1%
No family history	53.6%
Very aware & implementing	52.6%
Prefer professional counseling	21.3%
Goal: Reduce frequency	37.4%

Table 2 clinical parameters distribution among study population

Clinical Parameter	Count	Percentage (%)
Molar Relation - Class 1	147	69.7
Molar Relation - Flush Terminal Plane	58	27.5
Molar Relation - Class 2 variations	7	3.3
Crowding Present	43	20.4
No Crowding	152	72.0
Lower Anterior Crowding	16	7.5
Spacing	0	0.0
Deep Bite	4	1.9
Cross Bite	4	1.8
Open Bite	0	0.0
Midline Shift	2	0.9

The clinical analysis revealed that 69.7% of children exhibited a Class 1 molar relation, 27.5% had a flush terminal plane, and 3.3% showed Class 2 variations. Crowding was present in 20.4% of children,

with 72.0% showing no crowding and 7.5% exhibiting lower anterior crowding. Spacing was not observed in any child. Deep bite and cross bite were each present in 1.9% and 1.8% of children, respectively, while open bite was absent. Midline shift was observed in 0.9% of children, indicating minimal occurrence of this condition. The DMFT analysis showed a mean score of 0.82 ± 1.24, while the deft anis revealed a mean score of 3.86 ± 2.87.

Table 3 Correlation of Oral Habits with deft and DMFT Scores in Pediatric Populations

Habit	n	deft (Mean ± SD)	DMFT (Mean ± SD)
No habits	78	1.91 ± 1.62	0.53 ± 0.82
Thumb sucking	35	5.43 ± 3.05	1.1 ± 1.37
Nail biting	22	4.76 ± 2.51	0.18 ± 0.39
Tongue thrusting	19	4.93 ± 3.15	1.5 ± 1.95
Lip biting	16	5.82 ± 4.19	0.64 ± 0.92
Pencil biting	15	5.3 ± 3.62	1.4 ± 1.43
Mouth breathing	16	5.18 ± 2.96	1.45 ± 1.57
Other habits	11	5.17 ± 2.86	0.83 ± 0.98

The data reveals that among 211 children studied, the largest group was children without habits (n=78) showing the lowest mean scores (deft: 1.91 ± 1.62, dmft: 0.53 ± 0.82), while thumb sucking was the most prevalent habit (n=35) with elevated scores (deft: 5.43 ± 3.05, dmft: 1.1 ± 1.37). Notably, all oral habits demonstrated higher mean deft scores (ranging from 4.76 to 5.82) compared to their respective dmft scores (ranging from 0.18 to 1.50), indicating a greater impact of oral habits on primary dentition.

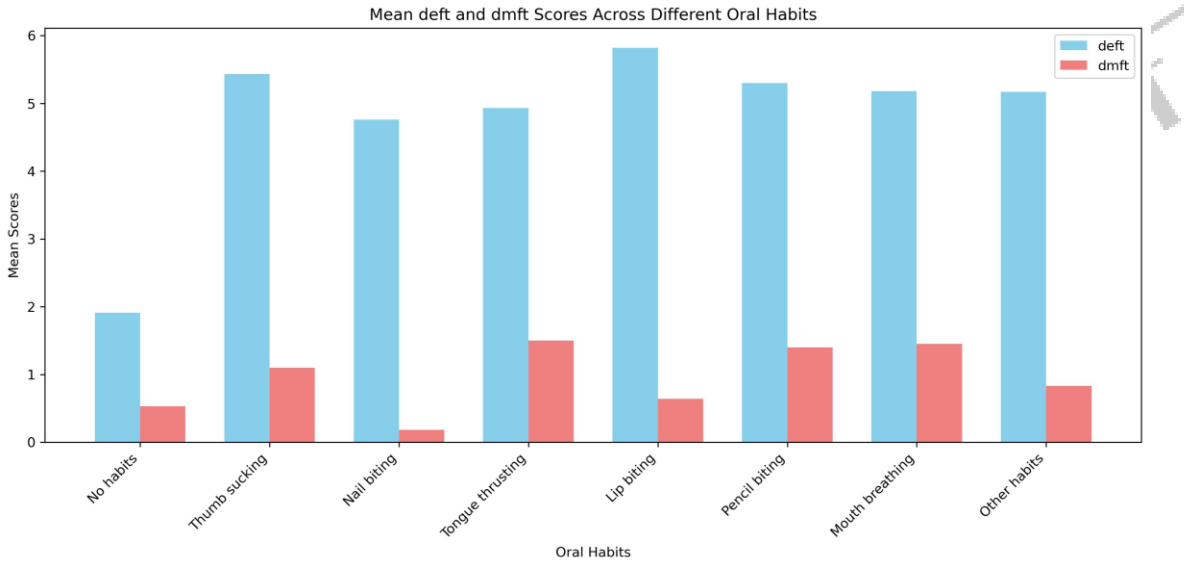

Fig 1Mean deft and dmft Scores Distribution Across Oral Habits

The graph demonstrates consistently higher deft scores (ranging from 1.91 to 5.82) compared to dmft scores (ranging from 0.18 to 1.50) across all oral habits, with lip biting showing the highest deft score (5.82) and nail biting the lowest dmft score (0.18). Children with no habits exhibited notably lower scores in both indices (deft=1.91, dmft=0.53), while other oral habits such as thumb sucking, tongue thrusting, and mouth breathing showed elevated scores in both categories, suggesting a significant impact of these habits on dental health.

Discussion

The study of oral habits among children is important for understanding their impact on dental health. The findings of the study, which involved 211 children with a mean age of 8.08 years, reveal significant insights into the prevalence and types of oral habits, as well as their correlation with deft and DMFT scores.

For instance, the study reported a prevalence of 34.1% for oral habits among children aged 11 to 13 years in Jaipur, which is comparable to the 37% of children in the current study who exhibited oral habits [4]. In contrast, the other study found a higher prevalence of 44.9% in school-going children from Karnataka, highlighting regional variations in oral habit prevalence [2]. This discrepancy may be attributed to differences in sample sizes, demographic factors, and methodologies employed in these studies.

The current study Identified thumb sucking as the most prevalent habit (16.5%), followed by nail biting (10.4%) and tongue thrusting (9.0%). These findings are consistent with those of [11], who also noted thumb sucking as a common oral habit among children. However, the prevalence of nail biting in the current study is notably higher than that reported by Oyedele [12], which found a lower incidence of similar habits. This suggests that cultural and environmental factors may influence the types of oral habits exhibited by children in different regions.

The analysis of oral examination revealed that children with oral habits had significantly higher deft scores compared to those without habits. Specifically, children who engaged in thumb sucking had the highest mean deft score of 5.43, indicating a strong association between this habit and dental caries.

Interestingly, the study also highlights the role of environmental and psychological factors in the development of oral habits. The majority of children reported boredom as the primary trigger for their habits. Additionally, the lack of professional evaluation for a significant number of children indicates a gap in dental care accessibility, which could be addressed through community outreach programs aimed at educating parents and guardians about the importance of monitoring and addressing oral habits early on.

Moreover, the study's findings regarding the correlation between oral habits and deft, DMFT scores emphasize the importance of early intervention strategies. The significantly higher deft scores among children with oral habits suggest that these habits may lead to increased dental caries, particularly in primary teeth. This is consistent with the findings of Kharbanda [8], who reported a similar association between oral habits and dental caries in their study of Indian children. The implications of these findings suggest that addressing oral habits early on could potentially reduce the burden of dental caries in pediatric populations.

It is also essential to implement community-based oral health education programs targeting parents and guardians to raise awareness about the significance of oral hygiene and the potential consequences of deleterious habits. Regular dental check-ups should be encouraged to facilitate early detection and intervention for children exhibiting harmful oral habits. Furthermore, integrating behavioral therapy and counseling into pediatric dental practices could provide effective strategies for habit cessation. Additionally, engaging children in structured activities could help reduce boredom and the possibilities of developing oral habits.

Conclusion

In conclusion, the study highlights the impact of oral habits on dental health among children. The findings emphasize the need to address these habits and promote better oral health outcomes. By promoting awareness and providing resources for parents and guardians, it is possible to reduce the prevalence of deleterious oral habits and improve the overall dental health of children.

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