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## Awareness of Oral Hygiene Maintenance and Correlation to the Dental Caries Status among School Going Children

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### ABSTRACT-

The prevalence of childhood dental caries remains a significant health concern, exerting detrimental effects on oral health and potentially impacting the overall well-being of affected individuals. This cross-sectional study aimed to assess the dental caries status among secondary school children aged 12-15 years and to gauge their awareness of oral hygiene practices. Conducting a questionnaire-based survey, we interviewed 200 school students to gather insights into their dental hygiene practices. The responses provided the foundation for a subsequent basic dental and oral examination, evaluating factors such as the condition of teeth, the number of carious teeth, and existing restorations. Each student underwent a personal interview and examination to ensure individualized attention. The results revealed a concerning prevalence of dental caries, with 65% of the participants exhibiting signs of the condition. However, a positive aspect emerged in the form of high awareness, as 92.5% of the children demonstrated a comprehensive understanding of dental hygiene. Despite this awareness, a disparity between knowledge and practice became apparent, with only 39.5% reporting twice-daily tooth brushing, and a mere 9% having visited a dentist. Additionally, 49% of participants reported rinsing their mouths after every meal, while 44% acknowledged frequent sugar exposure. Only 0.5% adhered to the recommended biannual dental check-ups. In conclusion, this study highlights the urgency of bridging the gap between awareness and effective oral hygiene practices among school children. The discrepancy between knowledge and action underscores the need for targeted interventions. Recommending regular dental check-ups and proposing dental camps within school settings could prove instrumental in improving the current situation. Moreover, an emphasis on comprehensive education for both children and parents is crucial to instill lasting habits that contribute to optimal oral health. Addressing these aspects can pave the way for a healthier future generation with improved oral hygiene practices and reduced prevalence of dental caries.

**Keywords:** Dental caries, Oral hygiene practices, secondary school going children

### I. INTRODUCTION

Childhood dental caries poses a significant and persistent threat to the oral health of young individuals, with potential implications for their overall well-being. Dental caries, if left untreated, can lead to severe consequences such as disruption of permanent teeth development, persistent pain, life-threatening infections, and the need for costly treatments. Recognizing the gravity of this issue, our study aims to assess the prevalence of dental caries among secondary school children aged 12-15 years. In addition to examining their dental condition, we seek to understand the current level of awareness regarding oral hygiene practices among this demographic. Dental health in children is a vital component of their overall health and development. The prevalence of dental caries serves as a key indicator of the efficacy of oral health practices within a given population. Despite advances in dental care and increased awareness, the persistence of dental caries among school-going children necessitates a closer examination of the factors contributing to this phenomenon. Our study adopts a comprehensive approach, employing a questionnaire-based cross-sectional design to gather insights directly from 200 secondary school students. By combining personal interviews and basic dental and

oral examinations, we aim to provide a holistic understanding of the relationship between awareness of oral hygiene practices and the actual dental caries status among these students. The findings of this study have the potential to inform targeted interventions aimed at improving oral health outcomes in this vulnerable demographic. As the prevalence of dental caries remains a pressing concern, identifying effective strategies to bridge the gap between awareness and practice is imperative. By doing so, we aspire to contribute to the development of practical and sustainable measures that promote optimal oral health and well-being among school children.

## II. METHODS

This well-structured cross-sectional study delves into the oral health status and hygiene practices of 200 school children aged 12-15 years in Karad Corporation Zone over a three-month period from July to September 2023. Focused on students in standard VIII to X, the study's sample size was meticulously calculated to include 200 children.

The inclusion criteria targeted school-aged children within the 10-15 age range who were present on the day of examination. Exclusion criteria were defined to exclude children with systemic illnesses and those lacking parental or guardian consent.

Data collection was executed through a pre-structured questionnaire, strategically designed to elicit socio-demographic information and insights into oral hygiene habits. This instrument facilitated the gathering of crucial details such as age, gender, socio-economic status, and oral health behaviors.

The oral health status of the participants underwent assessment via dental examinations conducted within the controlled environment of school premises, utilizing suitable natural lighting conditions. The examinations aimed to identify the presence of dental caries and their extent.

To quantitatively evaluate dental caries prevalence, the study employed the DMFT index, a widely recognized tool in oral epidemiology. This index provides a comprehensive assessment of Decayed, Missing, and Filled Teeth, offering valuable insights into the extent of dental caries within the studied population.

In adherence to ethical standards, the study obtained rigorous ethical approval from an Institutional Ethical Committee. Consent, both from educational institution authorities and the parents or guardians of participating children, was diligently acquired. These ethical measures were implemented to ensure the lawful and ethical conduct of the research, prioritizing the rights and privacy of the subjects involved.

## III. RESULTS:

### **SOCIO-DEMOGRAPHIC CHARACTERISTICS AND ORAL HYGIENE HABITS**

1. Dental Care Visits: 19 respondents (9.5%) had previously visited a dentist, while 181 individuals (90.5%) had not sought dental care.
2. Tooth Brushing Frequency: 79 participants (39.5%) reported adhering to a regimen of brushing their teeth twice a day, in contrast to 121 respondents (60.5%) who did not practice this routine.
3. Mouth Rinsing After Meals: Of the surveyed individuals, 98 respondents (49%) indicated the habit of rinsing their mouth after every meal, while 102 participants (51%) did not follow this practice.
4. Perception of Tooth Decay: A total of 47 participants (23.5%) self-reported believing that their teeth were decayed, while 153 individuals (76.5%) did not hold this perception.
5. Tongue Cleaning: A significant proportion of the participants, 74 individuals (37%), reported cleaning their tongue, while 126 respondents (63%) did not engage in this practice.
6. Awareness of Sugar Exposure and Caries: Eighty-eight respondents (44%) acknowledged that frequent sugar exposure could lead to dental caries, whereas 112 individuals (56%) did not share this awareness.
7. Response to Decay Signs: Only 34 participants (17%) reported seeking dental care upon observing signs of tooth decay, whereas 166 individuals (83%) did not adopt this course of action.
8. Belief in Oral Hygiene and Tooth Decay: The majority, 185 individuals (92.5%), believed that poor oral hygiene was a causal factor for tooth decay, while 15 participants (7.5%) did not subscribe to this belief.
9. Presence of Dental Fillings: Fifteen respondents (7.5%) indicated having filled teeth, whereas 185

individuals (92.5%) did not have any dental fillings.

10. **Belief in Toothbrush Efficacy:** All respondents (100%) were in agreement that regular tooth brushing can prevent tooth decay.

11. **Effect of Fizzy Drinks on Teeth:** Fifty-four respondents (27%) held the belief that fizzy drinks have an adverse effect on dental health, whereas 146 individuals (73%) did not share this belief.

12. **Bleeding Gums While Brushing:** Thirty-two participants (16%) reported experiencing gum bleeding while brushing, while 168 individuals (84%) did not encounter this issue.

13. **Dental Check-Up Frequency:** Only one respondent (0.5%) reported visiting a dentist every six months, while 199 individuals (99.5%) did not adhere to this routine.

14. **Toothbrush Replacement Interval:** A majority, 134 participants (67%), adhered to the practice of changing their toothbrush every three months, while 66 individuals (33%) did not follow this practice.

15. **Nighttime Tooth Brushing and Decay Prevention:** A total of 93 participants (46.5%) believed that brushing teeth at night could prevent tooth decay, while 107 individuals (53.5%) did not hold this belief.

**Table 1:socio-demographic characteristics and oral habits:**

S. No	Question	Yes Freque ncy	% Percent age	No Freque ncy	% Percent age
1	Have you ever visited a dentist?	19	9.5	181	90.5
2	Do you brush your teeth twice a day?	79	39.5	121	60.5
3	Do you rinse your mouth after every meal?	98	49	102	51
4	Do you think your teeth are decayed?	47	23.5	153	76.5
5	Do you clean your tongue?	74	37	126	63
6	Do you think frequent sugar exposure can cause caries?	88	44	112	56
7	If you have a sign of decay do you visit your dentist?	34	17	166	83
8	Do you think poor oral hygiene is the reason for tooth decay?	185	92.5	15	7.5
9	Do you have any filled teeth?	15	7.5	185	92.5
10	Do you think brushing teeth can prevent tooth decay?	200	100	0	0
11	Do you think fizzy drinks affects tooth adversely?	54	27	146	73
12	Do your gums bleed while brushing?	32	16	168	84
13	Do you visit your dentist after every 6 months?	1	0.5	199	99.5
14	Do you change your brush after every 3 months?	134	67	66	33
15	Do you think brushing teeth at night can prevent it from decay?	93	46.5	107	53.5

### ***The Prevalence of Dental Caries***

It was found that 130 out of the 200 children had dental caries. The overall prevalence of dental caries was 65 %

### ***Association between oral hygiene habits & Dental caries***

1. **Dental Visits:** A strong association was detected between visiting a dentist and dental caries. Those who had visited a dentist exhibited a significantly lower DMFT (Decayed, Missing, and Filled Teeth) index of 3 (15.7%), in contrast to those who had not visited a dentist, where the DMFT index was substantially higher at 127 (70.17%). This association was highly statistically significant ( $p < 0.0001$ ), suggesting that dental visits are closely linked to reduced dental caries.

2. **Tooth Brushing Frequency:** An important relationship was identified between brushing teeth twice a

day and dental caries. Individuals who adhered to this habit had a considerably lower DMFT index of 15 (18.9%), while those who did not brush twice a day exhibited a notably higher DMFT index of 115 (95.04%). This association was highly statistically significant ( $p < 0.0001$ ), indicating that frequent tooth brushing is correlated with reduced dental caries.

3. Mouth Rinsing After Meals: There was a significant relationship between the practice of rinsing the mouth after meals and dental caries. Those who rinsed had a notably lower DMFT index of 20 (20.4%), while those who did not rinse had a higher DMFT index of 110 (92.7%). This relationship was highly statistically significant ( $p < 0.0001$ ), suggesting that mouth rinsing is linked to reduced dental caries.

4. Awareness of Sugar Exposure and Caries: A robust and highly statistically significant association was observed between awareness of frequent sugar exposure as a causative factor for caries and the presence of dental caries. Individuals who acknowledged the role of sugar exposure exhibited a substantially higher DMFT index of 128 (69.84%), while those who were unaware had a much lower DMFT index of 2 (1.78%). This association was highly statistically significant ( $p < 0.0001$ ).

5. Belief in Poor Oral Hygiene and Tooth Decay: A significant and highly statistically significant relationship was found between the belief in poor oral hygiene as a cause of tooth decay and dental caries. Those who held this belief had a significantly lower DMFT index of 8 (4.32%), while those who did not share this belief exhibited a notably higher DMFT index of 122 (12.2%). This association was highly statistically significant ( $p < 0.0001$ ).

6. Belief in Toothbrush Efficacy: All participants believed that brushing teeth can prevent tooth decay; however, this belief did not show a statistically significant association with the DMFT index.

7. Gum Bleeding While Brushing: A highly statistically significant association was observed between gum bleeding during brushing and dental caries. Individuals who experienced gum bleeding had a notably higher DMFT index of 10 (31.25%), in contrast to those who did not experience gum bleeding, who exhibited a lower DMFT index of 120 (71.4%). This association was highly statistically significant ( $p < 0.0001$ ).

8. Nighttime Tooth Brushing and Decay Prevention: A robust and highly statistically significant association was observed between the belief that brushing teeth at night can prevent decay and the DMFT index. Participants who held this belief had a significantly lower DMFT index of 10 (10.7%), while those who did not share this belief had a notably higher DMFT index of 120 (89.1%). This association was highly statistically significant ( $p < 0.0001$ ).

**Table 2 association between oral hygiene habits and dental caries**

No	Question	DMFT (yes)	DMFT (no)	p value
1	Have you ever visited a dentist?	3	127	<0.0001
2	Do you brush your teeth twice a day?	15	115	<0.0001
3	Do you rinse your mouth after every meal?	20	110	<0.0001
4	Do you think your teeth are decayed?	40	90	
5	Do you clean your tongue?	40	90	
6	Do you think frequent sugar exposure can cause caries?	128	2	<0.0001
7	If you have a sign of decay do you visit your dentist?	15	115	
8	Do you think poor oral hygiene is the reason for tooth decay?	8	122	<0.0001
9	Do you have any filled teeth?	15	115	
10	Do you think brushing teeth can prevent tooth decay?	125	5	<0.16
11	Do you think fizzy drinks affect teeth adversely?	38	92	
12	Do your gums bleed while brushing?	10	120	<0.0001
13	Do you visit your dentist after every 6 months?	7	123	0.6
14	Do you change your brush after every 3 months?	10	120	
15	Do you think brushing teeth at night can prevent decay?	10	120	<0.0001

#### IV. DISCUSSIONS:

In the current investigation, the study revealed an overall prevalence of dental caries at 65%. Specifically, within the population of school children in Karad Taluka, 65% exhibited dental caries. Notably, a higher prevalence of dental caries, reaching 65.6%, was observed among school children in Nellore district as reported in a previous study<sup>8</sup>. Comparable findings were also documented in a study conducted in Bharatpur city, Rajasthan<sup>9</sup>

Shanthi Ramesh and colleagues' research from Chennai unveiled a caries prevalence of 48.9% among individuals aged 10 to 15 years<sup>10</sup>. In a separate study conducted by Saravanan et al in rural Tamil Nadu, a lower caries prevalence of 27% was found in the age group of 5 to 10 years<sup>11</sup>.

The authors of this study noted that a substantial majority, specifically 99.5% of the children, had never availed themselves of dental health care services. This is consistent with findings from a study in Nepal, which reported that 93% of children had never sought dental care services<sup>12</sup>. It is worth emphasizing that regular dental checkups and the practice of good oral hygiene were associated with a reduced incidence of dental caries<sup>13</sup>

Recent guidelines issued by the World Health Organization (WHO) recommend limiting the consumption of free sugars to less than 5% of total daily energy intake to mitigate the risk of dental caries<sup>14</sup>. Dental caries is primarily attributed to the interplay between oral bacteria, predominantly *Streptococcus mutans*, and dietary carbohydrates acting upon tooth enamel. This interaction results in the bacterial fermentation of dietary sugars, generating organic acids that lead to a decrease in oral pH. Consequently, this process induces demineralization, a progressive erosion of tooth enamel, and the formation of cavities in the teeth<sup>4</sup>. In alignment with these principles, the present study also found that children who consumed sweets on a daily basis exhibited a higher prevalence of caries, reaching 44%. These findings parallel those observed in previous studies<sup>15,16</sup>.

#### V. CONCLUSION:

Optimal dental health plays a pivotal role in upholding comprehensive nutritional well-being and overall physical health. Within the confines of this investigation, a heightened prevalence of dental caries was discerned among the student population. Furthermore, this study underscored that a greater propensity for dental caries was observed among children who engaged in daily sweet consumption, lacked consistent daily intake of vegetables and fruits, and did not adhere to nighttime tooth brushing practices.

Consequently, it is imperative to emphasize health education initiatives geared toward instilling the significance of maintaining sound dental hygiene. This encompasses the adoption of proper oral hygiene protocols, including the practice of nighttime tooth brushing, dietary modifications characterized by increased incorporation of vegetables and fruits alongside curtailed sugar consumption, and periodic dental check-ups for all students. These interventions hold substantial potential for mitigating the incidence of dental caries.

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