



Prevalence of Dental Caries and Oral Hygiene Practices Among School-Age Children

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ABSTRACT

Dental caries is a leading global child health problem among school-going children that has a significant impact on their health and quality of life in general. The paper explores the dental caries and oral hygiene practices among school children in Coimbatore, India. In this cross-sectional study, 500 children aged 6-12 years in urban and rural schools were used. A questionnaire and clinical dental examination were the instruments used to gather data. The researchers discovered that 38 percent of the children were experiencing dental caries, with a greater percentage reported to be among those children who brushed their teeth less often and were frequent consumers of sugary snacks. The researchers also determined that 42 percent of children had never been to a dentist, and 50 percent of them could not use a toothpaste with fluoride. The results indicate that more oral health education and dental care should be accessible, particularly in rural communities.

Keywords: *Dental Caries, Oral Hygiene Practices, School-Age Children, Tooth Decay, Preventive Dentistry, Oral Health Education, Pediatric Dentistry.*

INTRODUCTION

One of the most widespread childhood ailments in the whole world, dental caries, also referred to as tooth decay, has extensive key implications on health, social well-being, and education. It is brought about by an interplay between diet, mouth bacteria, and poor oral hygiene, with resultant demineralization of tooth enamel and tooth cavities [1]. Dental caries may lead to pain, infection, eating difficulties, and even loss of

teeth should it not be treated. It has far-reaching effects on children's education since children with dental pain may experience difficulty in concentration, attendance, and education.

The importance of oral hygiene habits in the prevention of dental caries cannot be overestimated [2]. To prevent the decay of the teeth, it is necessary to brush them using fluoride toothpaste, use the flossing tool, limit the number of sugar-containing foods, and visit the dentist regularly. Nevertheless, poor oral health is common among most children owing to the fact that most people have not mastered these practices, even though they are well-versed in them [5].

The proposed research will examine the most common patterns of dental caries and oral hygiene among school-age children in Coimbatore, India. It aims at determining the risk factors linked with dental caries, such as oral hygiene and dietary practices [6]. The results will be useful in the efforts by the public health sector in enhancing the oral health of children in India.

Key Contribution:

- The article offers useful knowledge on the high rate of dental caries in school-age children in Coimbatore, which shows a significant oral health issue.
- It determines the effectiveness of oral hygiene (frequency of brushing teeth and use of fluoride toothpaste) and diet in dental caries prevalence.
- The paper underlines the necessity to conduct specific oral health education and better dental access, particularly to rural communities, to combat the high rate of dental caries among children.

This is followed by the Introduction section, which provides background details on the significance of dental health and oral hygiene habits on school-going children, as well as the purpose of the research and why the research has to be conducted. The Literature Review explores past studies on dental caries prevalence and points out how the oral hygiene practices, diet, and socioeconomic conditions influence the prevalence of caries. Under the Methodology section, the research design, data collection, and statistical analysis that will be applied in measuring the prevalence of dental caries and oral hygiene practices are described. The Results section describes the most important findings, such as the prevalence of dental caries and the correlation of oral hygiene practices and caries prevalence. These results are interpreted in the Discussion in terms of the existing literature and factors that lead to dental caries and study limitations. The conclusion provides the findings summary, with recommendations on how the oral health of children can be improved by educating them and providing easier access to dental care.

LITERATURE REVIEW

Dental caries has continued to be one of the leading childhood diseases in the world, with a high proportion of school-going children being exposed to the disease [3]. The rate is terrifying in both developed and developing countries, with research showing that a large percentage of children experience dental caries, especially in urban and rural regions [4].

Various pieces of literature have underlined the close relationship that exists between oral hygiene behaviors and dental caries development [7]. Fluoride toothpaste has been considered one of the most effective preventive measures against caries since it is widely recognized that regular brushing with fluoride toothpaste is one of the most effective preventive measures against caries. The frequency of children brushing their teeth with fluoride toothpaste at least three times per day is also significantly lower than that of children who brush their teeth less often, who have a higher risk of developing dental caries [10]. More so, a high sugar diet is one of the leading factors that result in dental caries since sugar serves as the source of food to the bacteria that cause tooth decay.

Even with the preventive measures that are known, most children fail to practice optimal oral hygiene [8]. A high percentage of children, especially in rural regions, do not brush their teeth twice a day and do not attend the dentist regularly to have their teeth checked. Income, parental level of education, and health care facilities have been shown to be the socioeconomic aspects that contribute to dental caries prevalence, with

children in lower socioeconomic status having a greater likelihood of poor oral hygiene practices and untreated dental caries [9].

METHODOLOGY

This research uses a cross-sectional research design to determine the prevalence of dental caries and the oral hygiene behavior of school-going children in Coimbatore, India. The cross-sectional design was chosen as a means to get a picture of current dental health and oral hygiene practices of children at a particular period of time. To identify any disparity in dental health in various socioeconomic backgrounds, the data were collected in 10 schools, both urban and rural, to include any differences in dental health. The research took place in 2025, where 500 children aged between 6 and 12 years were used in the study; the sampling was done using stratified random sampling to get the same number of children in the urban and rural areas.

Study Population and Sampling

The population sample was comprised of school-going children in Coimbatore, both in urban and rural schools. It used stratified random sampling as the sample, where schools were grouped as urban or rural to have a wide representation. The children taking part in the study were registered in the chosen schools, and those with pre-existing diseases that may interfere with the evaluation (orthodontic treatment or serious illnesses) could not take part in the study.

Data Collection

The two major tools that were used to determine the data were a parental questionnaire and a clinical dental examination. The parental questionnaire was employed to obtain the data about the oral hygiene behaviors of the children, mainly the frequency of brushing their teeth, the use of fluoride toothpaste, dietary (consumption of sugars), and dental (frequency of visiting the dentist) habits. The socioeconomic background of the children (parental education level and family income), which is also essential in determining oral health outcomes, was also taken into account in this questionnaire.

Trained dental professionals conducted the clinical dental examination of the patient, and the severity and prevalence of the dental caries were determined by the DMFT (Decayed, Missing, Filled Teeth) index. This standard index gave a complete assessment of the dental health of every child, identifying the count of decayed teeth, lost teeth (extracted), and fixed teeth (filled with a restoration as a result of caries). The test also made an objective assessment of dental caries prevalence in the children.

Variables

The study's primary outcome variable was the prevalence of dental caries, determined by the DMFT index. Key independent variables included:

- **Brushing frequency:** Children who brush their teeth twice a day were compared to those who brush once or less.
- **Use of fluoride toothpaste:** Children who used fluoride toothpaste versus those who used non-fluoride toothpaste.
- **Dental visits:** Frequency of dental check-ups, categorized as once a year or more and less than once a year.
- **Dietary habits:** Consumption of sugary foods, categorized as frequent (more than 3 times a week) and infrequent (less than 3 times a week).
- **Socioeconomic factors:** Family income and parental education level.

Data Analysis

The SPSS (Statistical Package for the Social Sciences) version 25.0 was used to analyse the data obtained with the questionnaires and clinical examination. The frequency of dental caries and the prevalence of oral hygiene practices were summarized using descriptive statistics as they were distributed among the study population. The relationship between the presence of dental caries and the behavior of oral hygiene (e.g., brushing frequency and fluoride toothpaste) was investigated by chi-square tests. The logistic regression

analysis was done to determine the significant predictors of dental caries, controlling for them using the potential confounders such as the socioeconomic status and dietary habits.

Ethical Considerations

The Coimbatore Medical College Institutional Ethical Review Board gave a green light to the study. Any ethical consideration was adhered to. The parents or guardians of the children involved have informed consent. The respondents would be guaranteed the privacy of their answers, and the information gathered would be utilized in the course of research only. In case of children with serious dental caries during the clinical examination, the children were referred to the dental clinics in the area to receive proper treatment.

RESULTS

Demographic Information

The study population was made up of 500 children aged 6 to 12 years old, including 52 percent male ($n = 260$) and 48 percent female ($n = 240$). The gender balance in this sample was good since the sample was well-balanced in terms of gender. Both urban and rural schools in Coimbatore were used to select the children so that a total picture regarding the health of the population in terms of dental health could be offered. The general rates of dental caries of the study were determined to be 38, indicating that close to two children in every five children in the sample had observed signs of tooth caries. Under the analysis of the prevalence by age groups, 45% of 45% among children between the ages of 9-12 years was significantly higher than the 30% prevalence among children between the ages of 6-8 years. This implies that the prevalence of dental caries increases with age, and it is possibly because of long-term exposure to cariogenic factors like poor oral care or diets.

Oral Hygiene Practices

The research evaluated different oral health behaviours to ascertain how the behaviours correlated with dental caries. One of the most important practices that was explored was that of brushing frequency. Sixty percent of the children treated for dental caries ($n = 350$) indicated that they brushed their teeth twice a day, which was equivalent to the recommended level of dental caries prevention. Nevertheless, a quarter of children ($n = 100$) brushed once a day, and a tenth of children ($n = 50$) brushed less often than once a day. The results indicate a worrying rate of the population with poor brushing habits and, consequently, a risk of plaque formation and tooth decay. In the case of fluoride toothpaste, half of the children ($n = 250$) were using fluoride toothpaste, which is very necessary in preventing decay and building tooth enamel. Nonetheless, half of the children ($n = 250$) were not taking fluoride toothpaste, which might make their teeth more susceptible to decay.

The frequency of dental visits was also studied. It was established that 58 percent ($n = 290$) of the children had attended a dentist within the last year, which is a fairly satisfactory rate of dental care attendance. But the number of those who had never been to a dentist is 42 percent ($n=210$), which is an alarm as to the availability of oral health and the loss of chances at early diagnosis and treatment of dental caries.

Regarding eating patterns, especially snacks and drinks containing sugars, 65 percent of children ($n = 325$) said that they have consumed snacks or drinks with sugars at least once a day. The common use of sugary food is a common risk factor of dental caries because sugar has been found to be the source of food for the bacteria that cause tooth decay. Alternatively, a smaller proportion of children (35 percent; $n = 175$) took in less sugar food, which probably provides certain protection against caries, in contrast to children who took in sugar food on a daily basis.

Statistical Analysis

In order to examine the data, chi-square tests were employed to investigate whether there were relationships between oral hygiene practices and the occurrence of dental caries. The findings demonstrated that brushing frequency and caries in the mouth had a statistically significant relationship ($p < 0.05$). In particular, children with lower brushing of their teeth were prone to dental caries. There was an overwhelming

probability that children who only brushed their teeth less than once per day were more likely to have dental caries than those who brushed their teeth twice per day. This implies that brushing is a very important preventive activity that prevents tooth decay.

On the same note, there was a strong relationship observed between dental caries and consumption of sugary food ($p < 0.05$). The children who had dental caries had a higher tendency to have sugary snacks or drinks on a daily basis compared to the children who lacked dental caries and had sugary foods less often. The constant availability of sugar exposes the mouth to the danger of an increase in bacteria, and this results in the production of acid and, consequently, tooth decay.

In order to further analyse the effects of these variables on dental caries, a logistic regression analysis was conducted. The review has found that children who brushed their teeth less than once daily had 2.5 times higher chances of having dental caries as compared to children who brushed their teeth in the morning and evening. This reiterates the need for regular oral health maintenance in the prevention of dental caries. Also, the review revealed the good use of sugar intake in the etiology of dental caries, which supports the dietary interventions to supplement good oral hygiene habits.

Socioeconomic Factors

The paper also looked at how socioeconomic factors could have contributed to dental caries prevalence. It was established that children of lower socioeconomic status had more dental caries than those of higher socioeconomic status. It aligns with the literature available, in which dental and other medical care, educational resources, and oral hygiene products are usually of limited access in lower-income households. The results indicate that children living in a poor neighborhood might have reduced access to dentists and are prone to poor oral health habits that add to the increased dental caries prevalence.

DISCUSSION

The occurrence of dental caries in this study is in tandem with the results of the other studies in India, where dental caries impacts a significant percentage of school-going children. The relationship between oral hygiene and caries prevalence shows the relevance of brushing teeth with fluoride toothpaste and a reduction in the consumption of high levels of sugary food.

The major observation made during this research is that a large number of children do not attend a dentist often. Dental treatment is also a key element in the prevention and treatment of dental caries, and most children, particularly in rural communities, do not have access to affordable dental treatment. This indicates a requirement to have better dental facilities and outreach in low-income neighborhoods. It was also established that children who ate sugary foods regularly had higher chances of having dental caries. The above observation highlights the importance of dietary intervention and awareness of the dangers of sugary foods and beverages.

Even though the study showed a strong association between the practices of oral hygiene and dental caries, the study had limitations. The cross-sectional design does not provide the possibility to determine causality, and self-reported information on oral hygiene practices can be recalled. Longitudinal studies should also be incorporated in future research in order to determine the long-term effects of oral hygiene practices on caries.

CONCLUSION

To sum up, dental caries is a critical health problem among school-going children in Coimbatore, and poor oral hygiene behaviors, such as lack of brushing of teeth and poor diets, have been some of the reasons why the prevalence of dental caries is high. The research mentions the necessity of specific oral health programs in schools to encourage people to brush their teeth regularly, use fluoride toothpaste, and eat well. The intervention of dental care should also be given to the public, particularly in rural settings, in order to alleviate the load of dental caries among children. More studies are also required to examine the efficacy

of school-based oral health education programs and whether the overall outcome of dental health among children will be improved after the enhancement of oral hygiene practices.

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