



“PREVALENCE OF DENTAL CARIES AMONG SCHOOL-GOING CHILDREN IN NORTH KARNATAKA”

Community Medicine

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ABSTRACT

Background: Dental caries is a common oral health issue among children worldwide, with varying prevalence rates across different regions. Understanding the prevalence and associated factors is crucial for implementing effective preventive measures. **Aim & Objectives:** The aim of this study was to assess the prevalence of dental caries among school going children in an urban area of North Karnataka. **Materials and Methods:** A descriptive cross-sectional study was conducted among 400 school children in North Karnataka aged between 10 to 16 years. Four schools were randomly selected from four zones: north, east, west, and south. The sample size was distributed among the schools using population proportionate sampling. Within each school, students were selected randomly. Dental examinations were conducted to assess the prevalence of dental caries using DMFT index, plaque, and calculus. **Results:** The study revealed an overall prevalence of dental caries among participants at 62%, with plaque and calculus prevalence at 56.2% and 33.75%, respectively. The prevalence of dental caries varied across different age groups, ranging from 46.67% to 66.67%. The highest prevalence of dental caries was observed in the school located in the east zone (72%), followed by the west (68%), north (65%), and south (58%) zones. The DMFT assessment showed 65% decayed teeth, 10% missing teeth, and 22.5% filled teeth, resulting in a total DMFT score of 390. Plaque was most prevalent on the buccal surface (80%), while calculus was most prevalent on the same surface (25%). **Conclusion:** This study highlights a moderate prevalence of dental caries among school children in North Karnataka. The findings underscore the need for targeted oral health interventions, particularly in regions with higher prevalence rates. Implementing preventive strategies and promoting oral hygiene practices can help mitigate the burden of dental caries among children.

KEYWORDS

Dental caries, school children, prevalence, DMFT index

INTRODUCTION

Dental caries, commonly known as tooth decay or cavities, is a chronic infectious disease that affects the hard tissues of the teeth. It remains one of the most prevalent oral health issues globally, particularly among children. The World Health Organization (WHO) recognizes dental caries as a significant public health problem due to its widespread occurrence and potential impact on individuals' quality of life.

The prevalence of dental caries varies widely across different regions and populations, influenced by a complex interplay of factors including socioeconomic status, dietary habits, access to oral healthcare services, and cultural practices. (1) In low- and middle-income countries (LMICs), where resources for oral healthcare are often limited, dental caries can pose a significant burden on children's overall health and well-being.

In India, like many other LMICs, dental caries remains a prevalent oral health issue, particularly among children. (2) The National Oral Health Survey and Fluoride Mapping conducted in 2002-2003 reported a high prevalence of dental caries among Indian children, with rural areas exhibiting higher rates compared to urban areas. (3,4) This disparity underscores the importance of understanding the local epidemiology of dental caries to develop targeted interventions and allocate resources effectively.

Understanding the prevalence of dental caries among school children is crucial for informing public health policies and interventions aimed at reducing the burden of this preventable disease. (5) By assessing the prevalence of dental caries and its associated factors, researchers and policymakers can identify high-risk populations, prioritize resources, and develop tailored interventions to promote oral health and prevent dental caries among children in diverse settings globally.

Therefore, this study aims to fill this gap in the literature by conducting a comprehensive assessment of the prevalence of dental caries among school children. By elucidating the epidemiology of dental caries in this specific population, this study seeks to contribute valuable insights to the field of oral health research and guide the development of evidence-based interventions to improve oral health outcomes among children in various settings worldwide.

OBJECTIVE:

To assess the prevalence of dental caries among school going children in an urban area of north karnataka

MATERIALS AND METHODS:

A descriptive cross-sectional study was conducted to assess the prevalence of dental caries, plaque, and calculus among school children aged between 10-16 years in an urban area of North Karnataka. The sample size was calculated based on a previous study's prevalence rate of dental caries (62%) with a margin of error (5%). Using the formula for estimating sample size for a single proportion: $n = d^2 Z^2 \times p \times (1-p)$. Plugging in the values ($=0.62$, $p=0.62$, $=1.96$, $Z=1.96$, $=0.05$, $d=0.05$), (3) the calculated sample size came up to be 382. Rounding up to ensure adequate power and representation, a total of 400 school children were included in the study. Four schools were chosen at random from the urban region of North Karnataka, with the sample size distributed proportionately among them. Within each school, students aged 10 to 16 were randomly chosen to take part in the study. A self-administered, semi-structured questionnaire was utilized to gather demographic details and other pertinent variables. Dental examinations after consent from parents and assent from study participants were carried out by a trained professional to determine the prevalence of dental caries using the DMFT (Decayed, Missing, Filled Teeth) index. Dental caries was identified through visual inspection and tactile examination using a dental mirror and explorer. Plaque and calculus assessments were conducted and recorded for each tooth surface. Statistical analysis was performed using appropriate SPSS software. Descriptive statistics including frequencies, percentages, means, and standard deviations were calculated to summarize the data.

RESULTS:

A total of 400 students aged between 10 and 16 years participated in the study conducted in urban areas of North Karnataka. The mean age of the participants was 13.5 years, with a standard deviation of 1.2 years, indicating a relatively narrow age range. Among the participants, 52.5% were male (210 students) and 47.5% were female (190 students). 318 (79.44%) of the study participant belonged to socioeconomic class I according to Modified B. G. Prasad's classification.

Overall prevalence of the students who participated in the study is as follows: Dental Caries: 62%, Plaque: 56.25%, Calculus: 33.75% (Table:1)

Table 1: Prevalence of Dental Caries:

Oral Health Parameter	Prevalence (%)
Dental Caries	62%
Plaque	56.2%
Calculus	33.75%

The prevalence of dental caries among school children aged 10 to 16 years in urban areas of North Karnataka varies across different age. It ranges from 46.67% to 66.67%, with an overall average prevalence of approximately 62%. (Table:2)

Table 2: Age wise Prevalence of Dental Caries:

Age in years	Prevalence of Dental Caries Number (%)
10	14 (46.6%)
11	32 (64%)
12	46 (65.7%)
13	50 (62.5%)
14	60 (66.6%)
15	36 (60%)
16	10 (50%)

The school in the east zone shows the highest prevalence of dental caries at 72%, followed by the west zone school at 68%. In comparison, the school in the north zone exhibits a slightly lower prevalence at 65%, while the south zone school has the lowest prevalence at 58%.

The DMFT assessment showed that 65% of the teeth had decay, 10% were missing, and 22.5% were filled. This resulted in a total DMFT score of 390 and the mean DMFT score is 0.975 (Table 3)

Table 3: Distribution of DMFT Scores Among School Children

DMFT Component	Number of Teeth Affected	Percentage (%)
Decayed Teeth (D)	260	65%
Missing Teeth (M)	40	10%
Filled Teeth (F)	90	22.5%
Total DMFT Score	390	

Plaque was found to be present on a significant percentage of tooth surfaces, with the highest prevalence observed on the buccal surface 320 (80%). (Table 4)

Table 4: Distribution of Plaque Presence on Different Tooth Surfaces

Tooth Surface	Number of Teeth with Plaque	Percentage (%)
Buccal Surface	320	80 %
Lingual Surface	280	70 %
Occlusal Surface	180	45 %
Mesial Surface	240	60 %
Distal Surface	200	50%
Total Teeth	1220	

Calculus was found to be present on a smaller percentage of tooth surfaces compared to plaque, with the highest prevalence observed on the buccal surface 100 (25%). (Table 5)

Table 5: Distribution of Calculus Presence on Different Tooth Surfaces

Tooth Surface	Number of Teeth with Calculus	Percentage (%)
Buccal Surface	100	25%
Lingual Surface	80	20%
Occlusal Surface	60	15%
Mesial Surface	40	10%
Distal Surface	50	12.5%
Total Teeth	330	

DISCUSSION:

The prevalence of dental caries varies significantly across different age groups among school children in urban North Karnataka, ranging from 46.67% to 66.67%. This variation underscores the intricate interplay of various factors such as biological, behavioral, socio-economic, and environmental influences. Factors like parental supervision of oral hygiene may contribute to lower prevalence rates among younger children, while adolescents may face heightened susceptibility due to dietary choices and limited access to preventive care. Additionally, socio-economic disparities and environmental factors further shape these differences. Comparing our study findings with existing literature, Khanat et al. (2017) reported a prevalence of 62% among primary school children in Kathmandu district, Nepal, which closely aligns with our study's results (6). In contrast, Shailee et al. (2013) found lower prevalence rates of 32.6% and 42.2% among 12- and 15-year-old school children in Shimla city, respectively. Their reported mean DMFT scores also indicate a relatively lower caries experience

compared to our findings (7). Karunakaran et al. (2014) observed a slightly higher prevalence of 65.88% among 4-6-year-old school children in Namakkal district, emphasizing the persistent challenge of dental caries prevalence across different age groups and geographical regions (8).

LIMITATIONS:

The study's cross-sectional design captures only a momentary snapshot of dental health, lacking the capacity to track changes over time. Longitudinal studies would offer a more thorough comprehension of dental health trends. Moreover, the study concentrated exclusively on the prevalence of dental caries, plaque, and calculus among school children, without exploring crucial factors like access to dental care or fluoride exposure that significantly influence dental health.

CONCLUSION:

In conclusion, this study provides valuable insights into the prevalence of dental caries, plaque, and calculus among school children in urban North Karnataka. The findings highlight the importance of addressing oral health issues in this population through targeted interventions. By identifying areas of concern, such as variations in prevalence rates across different age groups, the study contributes to the development of effective oral health strategies tailored to the needs of school children in the region. Moving forward, further research is warranted to deepen our understanding of oral health dynamics and to inform comprehensive interventions aimed at promoting better oral health outcomes among school children.

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