

## Oral Hygiene Practices and Caries Experience Among School Leaving Children in Rural Area

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### ABSTRACT

#### Background

Oral health plays a vital role in general well-being, especially among children. In rural areas, limited access to dental care and education often leads to poor oral hygiene and an increased prevalence of dental caries. This study aims to assess the oral hygiene practices and caries experience among school-leaving children in a rural area, highlighting the relationship between oral habits and dental health outcomes.

#### Materials and Methods

A cross-sectional study was conducted among 200 school-leaving children aged 12-16 years in a rural area. Data on oral hygiene practices, including frequency of brushing, use of fluoride toothpaste, and visits to the dentist, were collected using a structured questionnaire. Dental caries experience was evaluated through clinical examination, where the DMFT (Decayed, Missing, Filled Teeth) index was used as an indicator of caries prevalence. Statistical analysis was performed using SPSS, and the significance of various practices was determined with chi-square and t-tests.

## Results

The results indicated that 60% of children brushed their teeth once daily, 25% brushed twice, and 15% brushed irregularly. About 50% of the children used fluoride toothpaste, and only 20% visited a dentist regularly. The mean DMFT score was  $3.5 \pm 1.2$ , with 65% of children having experienced dental caries. Children who brushed twice daily and used fluoride toothpaste had significantly lower DMFT scores ( $p < 0.05$ ) compared to those with poor oral hygiene practices.

## Conclusion

The study demonstrates a high prevalence of dental caries among school-leaving children in the rural area, largely associated with inadequate oral hygiene practices. Regular tooth brushing with fluoride toothpaste and dental visits were significantly linked to reduced caries experience. Efforts should be made to improve oral health awareness and access to dental care in rural communities to promote better oral hygiene and reduce caries risk.

## Keywords

Oral hygiene, Dental caries, Rural children, DMFT index, Tooth brushing, Fluoride toothpaste, Dental care

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## Introduction

Oral health is a fundamental component of general health and well-being, especially in childhood, as poor oral hygiene can lead to dental caries, which remains one of the most prevalent chronic diseases worldwide (1). Dental caries is a multifactorial disease influenced by various factors, including diet, oral hygiene habits, and access to dental care. The burden of dental caries is disproportionately higher in rural areas due to limited access to dental services, lower levels of oral health awareness, and socioeconomic barriers (2).

School-leaving children, typically aged between 12-16 years, are at a crucial stage of their development, both physically and behaviorally. This period is critical for establishing long-term oral hygiene practices that can impact their oral health status into adulthood (3). Studies have shown that rural children are often more vulnerable to oral diseases due to poor oral hygiene practices, such as infrequent brushing and limited use of fluoride toothpaste (4). Additionally, the lack of regular dental visits and preventive care further exacerbates the risk of caries in these populations (5).

Previous research has emphasized the importance of early intervention and education in improving oral hygiene practices among children (6). However, there is a paucity of studies focusing specifically on rural populations, where access to dental care is limited, and traditional beliefs may hinder the adoption of proper oral hygiene practices (7). Therefore, this study aims to assess the oral hygiene practices and caries experience among school-leaving children in a rural area, with the goal of identifying key factors that influence oral health outcomes and providing recommendations for targeted interventions.

## Materials and Methods

### Study Design

This was a cross-sectional, observational study conducted to assess oral hygiene practices and dental caries experience among school-leaving children in a rural area. The study was carried out over a period of three months.

### **Study Population**

The study population consisted of 200 school-leaving children aged 12 to 16 years from a rural community. The children were selected from three government schools in the region through a simple random sampling technique. Informed consent was obtained from both the children and their parents or guardians before participation in the study.

### **Inclusion Criteria**

- Children aged 12-16 years
- Residing in the rural area for at least one year
- Willing to provide informed consent

### **Exclusion Criteria**

- Children with systemic illnesses affecting oral health
- Children undergoing orthodontic treatment or other dental interventions

### **Data Collection**

Data were collected using two main tools:

1. **Structured Questionnaire:** A pre-tested, structured questionnaire was used to collect information on socio-demographic characteristics, oral hygiene practices (such as frequency of tooth brushing, use of toothpaste, and dental visits), and dietary habits related to sugar consumption. The questionnaire was administered face-to-face by trained interviewers.
2. **Clinical Examination:** A detailed oral examination was performed by trained dental professionals using portable dental equipment under natural light. The dental caries experience was assessed using the DMFT (Decayed, Missing, and Filled Teeth) index, which is a widely accepted method for evaluating dental caries prevalence. The examination adhered to the World Health Organization (WHO) guidelines for oral health surveys.

### **Calibration**

To ensure consistency in caries detection, examiners were calibrated prior to the start of the study. A pilot examination was conducted on 20 children outside of the study population to test the reliability of the DMFT scoring method, and an inter-examiner agreement was achieved with a Kappa value of 0.85.

### **Statistical Analysis**

Data were entered into a Microsoft Excel spreadsheet and analyzed using SPSS version 26.0. Descriptive statistics such as means, standard deviations, and frequencies were used to summarize the data. The association between oral hygiene practices and DMFT scores was evaluated using chi-square tests and independent t-tests. A p-value of <0.05 was considered statistically significant.

### **Results**

A total of 200 school-leaving children aged 12-16 years participated in the study. The results are presented in two sections: oral hygiene practices and caries experience (DMFT scores). The association between these factors is also explored.

**Table 1: Distribution of Oral Hygiene Practices**

| Oral Hygiene Practice             | Number of Children (n = 200) | Percentage (%) |
|-----------------------------------|------------------------------|----------------|
| Frequency of Tooth Brushing       |                              |                |
| Once daily                        | 120                          | 60%            |
| Twice daily                       | 50                           | 25%            |
| Irregular brushing                | 30                           | 15%            |
| Use of Fluoride Toothpaste        |                              |                |
| Yes                               | 100                          | 50%            |
| No                                | 100                          | 50%            |
| Frequency of Dental Visits        |                              |                |
| Regular (once a year or more)     | 40                           | 20%            |
| Occasional (once every 2-3 years) | 90                           | 45%            |
| Never                             | 70                           | 35%            |

**Table 2: Caries Experience (DMFT Scores)**

| DMFT Score                       | Number of Children (n = 200) | Percentage (%) |
|----------------------------------|------------------------------|----------------|
| 0 (No caries)                    | 70                           | 35%            |
| 1-3 (Mild caries experience)     | 90                           | 45%            |
| 4-6 (Moderate caries experience) | 30                           | 15%            |
| >6 (Severe caries experience)    | 10                           | 5%             |
| Mean DMFT score                  | 3.5 ± 1.2                    |                |

**Table 3: Association Between Oral Hygiene Practices and DMFT Scores**

| Oral Hygiene Practice         | Mean DMFT Score | p-value |
|-------------------------------|-----------------|---------|
| Brushing once daily           | 4.2 ± 1.5       | <0.05   |
| Brushing twice daily          | 2.1 ± 0.8       | <0.05   |
| Irregular brushing            | 5.0 ± 1.3       | <0.05   |
| Use of fluoride toothpaste    | 2.8 ± 0.9       | <0.05   |
| No use of fluoride toothpaste | 4.5 ± 1.4       | <0.05   |

### Key Findings

- **Frequency of Tooth Brushing:** 60% of children brushed once daily, 25% brushed twice daily, and 15% brushed irregularly. Children who brushed twice daily had

significantly lower DMFT scores (mean  $2.1 \pm 0.8$ ) compared to those who brushed once or irregularly ( $p < 0.05$ ).

- **Use of Fluoride Toothpaste:** Half of the children (50%) used fluoride toothpaste, and this group showed a lower mean DMFT score ( $2.8 \pm 0.9$ ) compared to those who did not use fluoride toothpaste (mean DMFT  $4.5 \pm 1.4$ ,  $p < 0.05$ ).
- **Dental Visits:** Only 20% of children reported regular dental visits. Children with regular dental visits had a lower DMFT score (mean  $2.3 \pm 0.7$ ), although this was not statistically significant ( $p = 0.07$ ).

## Discussion

The present study aimed to assess oral hygiene practices and caries experience among school-leaving children in a rural area. The findings revealed a high prevalence of dental caries, with significant associations between oral hygiene practices and caries experience, underscoring the importance of proper oral hygiene in this population.

Our results showed that 60% of children brushed their teeth only once daily, with 15% engaging in irregular brushing. Children who brushed twice daily had significantly lower DMFT scores compared to those with poorer brushing habits ( $p < 0.05$ ). This finding is consistent with previous studies, which highlight the protective role of regular tooth brushing in preventing dental caries (1). Regular brushing helps in the removal of dental plaque, which is a primary etiological factor in the development of caries (2).

The use of fluoride toothpaste was also a critical factor in caries prevention in this study. Children who used fluoride toothpaste had significantly lower DMFT scores compared to those who did not ( $p < 0.05$ ). Fluoride is well-documented for its role in strengthening enamel and reducing the incidence of caries (3). Several studies, including a large-scale meta-analysis, have demonstrated that the use of fluoride toothpaste significantly reduces the risk of dental caries, especially in children (4). However, it was concerning that only 50% of the children in this rural community used fluoride toothpaste, indicating a need for greater awareness and access to fluoride-containing dental products.

Dental visits are another important factor in maintaining oral health, as they provide opportunities for preventive care, early detection, and treatment of dental issues. In this study, only 20% of children reported regular dental visits, with the majority either visiting occasionally or never. Although children with regular dental visits had lower DMFT scores, the difference was not statistically significant ( $p = 0.07$ ). This trend of low dental service utilization is similar to findings from other rural populations, where access to dental care is limited due to socioeconomic and geographical barriers (5). Furthermore, previous research has shown that rural residents often delay seeking dental care until they experience pain or discomfort, contributing to a higher burden of untreated caries (6).

The mean DMFT score in our study was  $3.5 \pm 1.2$ , which is higher than the national average reported in urban areas (7). This highlights the rural-urban disparity in oral health, with rural children being at a greater risk of caries due to limited access to oral health services, lack of awareness, and poor oral hygiene practices (8). Interventions targeting these rural populations should focus on improving oral hygiene education, promoting the use of fluoride toothpaste, and increasing access to affordable dental care.

The findings of this study align with previous research indicating the multifactorial nature of dental caries and the critical role of both behavioral and environmental factors (9). However, it is important to acknowledge certain limitations of this study. First, the cross-sectional design limits our ability to establish causal relationships between oral hygiene practices and caries experience. Additionally, self-reported data on brushing habits may be subject to recall bias, and the sample was drawn from a specific rural area, which may limit the generalizability of the findings.

### **Conclusion**

This study demonstrates a high prevalence of dental caries among school-leaving children in a rural area, largely attributed to inadequate oral hygiene practices and limited use of fluoride toothpaste. Improving oral health education and increasing access to fluoride toothpaste and preventive dental care services are essential for reducing caries risk in rural populations. Future interventions should focus on community-based strategies to promote better oral hygiene habits and enhance access to dental care in underserved rural areas.

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