Short Report

Field report: Exploring the oral health status of children in Kyabugumbi Village: A Survey in Bushenyi District, Uganda 2024

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ABSTRACT

Introduction: This study explores the oral health status of children in Kyabugimbi Village, Bushenyi District, Uganda, focusing on dental caries prevalence, oral hygiene, and tooth eruption patterns. **Methodology:** A cross-sectional survey was conducted among 256 children aged 6–12 years. Clinical examinations were performed using the Decayed, Missing, and Filled Teeth [DMFT] index and simplified oral hygiene index. **Results**: The findings revealed low caries prevalence, with 70% of children having no caries. Oral hygiene was generally acceptable, although some cases needed improvement. Unique eruption patterns, such as early maxillary canine emergence, were observed. Additionally, there was a significant prevalence of impacted canines and retained deciduous teeth. **Discussion**: These anomalies suggest the need for early orthodontic intervention. The study emphasizes the importance of community-based oral health education and regular dental check-ups in improving rural dental health outcomes. **Conclusion**: The findings provide valuable insights into oral health challenges in low-resource settings and support the development of targeted preventive and therapeutic interventions.

Keywords: Oral health, Dental caries, Oral hygiene, Tooth eruption patterns, Impacted canines, Rural health.

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INTRODUCTION

Oral health is a critical component of overall well-being, particularly in children, as it significantly affects their growth, development, and quality of life [1,2]. Despite global advancements in oral healthcare, disparities persist, especially in rural settings, where access to dental services remains limited [1] . The World Health Organization [WHO] emphasizes the importance of community-based oral health programs in addressing these challenges, particularly in low-resource settings [2].

In Uganda, rural communities often face barriers to accessing dental care, including limited infrastructure, lack of awareness, and financial constraints [3]. These challenges underscore the importance of assessing the oral health status of children to develop targeted interventions. Previous studies have shown that rural areas tend to have higher rates of untreated dental conditions, delayed dental visits, and limited preventive care [4].

Recent studies in rural African and Middle Eastern communities have consistently shown higher rates of untreated dental conditions, limited preventive services, and variations in eruption patterns compared to urban populations [5-7]. Such disparities are attributed to socio-economic factors, parental education, and geographic influences. Understanding these challenges is crucial to framing targeted community-based interventions that address both preventive and therapeutic oral health needs.

This survey, conducted among children at the Kyabugimbi Child Development Center, aimed to evaluate their oral health status, focusing on dental caries prevalence, oral hygiene standards, and variations in tooth eruption patterns. By examining these factors, the study seeks to contribute to the growing body of knowledge on rural oral health and provide actionable insights.

Objectives:

The primary objectives of the survey were:

1. Assess the prevalence of dental caries and oral hygiene status.
2. Identify deviations in tooth eruption sequences and other dental anomalies.
3. Provide recommendations for improving oral health through targeted interventions.

MATERIALS AND METHODS

Study Design

This study employed a cross-sectional design to assess the oral health status of children at the Kyabugimbi Child Development Center, located in Bushenyi District, Uganda. The survey was conducted as part of a broader initiative to promote oral & Mental health awareness in rural communities.

Participants

A total of 256 children, aged 6–12 years, were examined during the survey. These participants were selected based on their enrollment in the child development center and consent from their caregivers.

Data Collection

Data were collected through clinical oral examinations performed by trained dental professionals from Kampala International University Teaching & Research Hospital. The following parameters were assessed:

1. Dental Caries: Measured using the Decayed, Missing, and Filled Teeth [DMFT] index to evaluate the caries prevalence.
2. Oral Hygiene Status: Assessed visually based on the presence of plaque and gingival health.
3. Tooth Eruption Patterns: Observations of the sequence and timing of permanent tooth eruption.
4. Dental Anomalies: Incidence of retained deciduous teeth and impacted maxillary canines.

Ethical Considerations

Verbal consent was obtained from caregivers prior to the examination. The study adhered to ethical guidelines for research involving minors, ensuring confidentiality and the right to withdraw at any time. Permission was taken from caregivers regarding picturing oral health findings and disclosure of students' pictures.

Verbal informed consent was obtained from each caregiver in line with community research protocols, due to common literacy barriers. Additionally, verbal assent was obtained from all children aged above 7 years. The procedure was approved by the Child development center as well. While written consent is ideal, the context

required adapted ethical methods that were documented using checklists and verbal confirmation scripts to ensure compliance. The study complied with the Declaration of Helsinki for research involving human subjects.

Photographic documentation was carried out with full caregiver consent. All identifiable facial features were excluded or blurred to maintain anonymity. These images were used solely for academic purposes and publication only with anonymization and ethical approval.

RESULTS

Dental Caries Profile

The survey revealed a low prevalence of dental caries among the students. The Decayed, Missing, and Filled Teeth [DMFT] scores were categorized as seen in Table 1. Moreover ; severe form of dental caries was barely seen

Oral Hygiene Standards

The majority of students demonstrated acceptable oral hygiene, with visible signs of plaque control and healthy gingiva.

The oral hygiene was assessed using simplified oral hygiene index in order to categorize participants according to level of plaque and calculus accumulation as described by the index.

Tooth Eruption Patterns

Variations in the sequence of permanent tooth eruption were observed. Maxillary canines erupted before premolars, contrary to global patterns, as explained in Figure 1.

Prevalence of impacted canines

A concerning finding was the high prevalence of buccal displacement and impacted maxillary canines, with some cases potentially linked to congenital absence. This underscores the need for early detection and intervention to address possible orthodontic and periodontal issues.

DISCUSSION

The findings of this study provide critical insights into the oral health status of children in rural Uganda, emphasizing the importance of early detection and preventive care.

Low Caries Prevalence

The low DMFT scores among the surveyed children are an encouraging sign of effective oral hygiene practices and dietary habits. Similar studies in rural communities have highlighted the role of reduced sugar consumption and community-led oral health education in minimizing caries prevalence, yet Topical Fluoride Application was added to those on need, with total of 10 cases who undergone fluoride intervention.

Similar findings were reported in Saudi Arabian rural children, where low sugar intake and traditional diets were associated with lower DMFT scores despite limited dental visits [5]. This suggests that dietary practices may compensate for lack of dental infrastructure to some extent.

Variations in Eruption Patterns

The unique eruption sequence observed, where maxillary canines precede premolars, deviates from global patterns. This may be attributed to genetic or environmental factors specific to the population. These findings align with research suggesting that geographic and genetic diversity can influence dental development.

In Tanzania, eruption patterns among schoolchildren similarly showed earlier eruption of maxillary canines compared to global norms [8]. These regional eruption differences highlight the need for localized orthodontic assessment protocols rather than reliance on Western eruption charts.

These eruption differences may be influenced by both environmental and genetic factors. Studies suggest that dietary habits, fluoride levels in drinking water, and systemic health can alter eruption timing [9,10]. Moreover, hereditary influences play a role, as several population-based studies have found significant eruption pattern differences linked to ethnic and genetic backgrounds [11,12]. Further investigation into regional genetic profiles and environmental exposures is warranted.

Prevalence of Retained Deciduous Teeth

A higher prevalence of retained deciduous teeth was noted, particularly among males. This condition may lead to malocclusion or other orthodontic complications if not addressed. The gender disparity aligns with previous studies, which have also reported a higher tendency of retained teeth in male children.

Nigerian studies also reported high rates of retained

primary teeth, particularly among male students, supporting the idea that gender-specific biological factors may influence tooth exfoliation timing and consecutively the overall oral health [7,11].

Impacted Maxillary Canines

The survey identified a significant number of impacted or buccally displaced maxillary canines. This underscores the need for early orthodontic assessment and intervention to prevent long-term dental issues, including malocclusion and periodontal disease. A rural screening project in Nigeria identified impacted canines as a major contributor to future orthodontic burden [11]. Early radiographic screening programs have been recommended in similar settings to prevent complications.

Conclusion

The oral health survey conducted at Kyabugimbi Child Development Center provides valuable insights into the dental health of children in rural Uganda. The findings, such as the low prevalence of dental caries, acceptable oral hygiene standards, and unique eruption patterns, highlight the positive impact of ongoing community oral health education programs. However, the notable prevalence of retained deciduous teeth and impacted canines emphasizes the need for regular dental check-ups and early orthodontic intervention with further studies to discuss the eruption patterns.

Key Recommendations

1. Sustain Preventive Care Programs: Focus on promoting oral hygiene and dietary awareness.
2. Regular Dental Check-ups: Encourage periodic assessments to monitor and address dental anomalies.
3. Further Research: Investigate genetic and environmental factors influencing eruption patterns and dental anomalies.

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TABLES AND FIGURE

Tables

Table 1: DMFT Scores and Percentage of students

Category	Interpretation	Percentage of students %
No caries	DMFT =0	**70%**
Mild caries	DMFT =1-2	**20%**
Moderate caries	DMFT = 3-4	**8%**
Severe caries	DMFT >4	**2%**

The table 1 shows that most of the student's have no caries at all.

Table 2: Oral Hygiene practice measures across different ages and genders using Simplified oral hygiene index.

Category	Proportion of children		Recommendation
	Males	Females	
0 – 0.6 [Excellent oral hygiene]	71%	49%	Healthy oral hygiene
0.7 – 1.8 [Acceptable oral hygiene]	24%	43%	Needs improvement
1.9 – 3.0 [Poor oral hygiene]	4.9%	7.5%	Requires attention
3.1– Above [Very poor oral hygiene]	0.1%	0.5%	Urgent improvement needed

Table 3: Multivariate Logistic Regression Results for Predictors of Poor Oral Hygiene

Variable	Odds Ratio (OR)	p-value	Interpretation
Age	1.02	0.07	Not statistically significant
Gender (Male)	1.5	< 0.05	Significant predictor
Caries Presence	2.2	< 0.01	Strong predictor

Figures

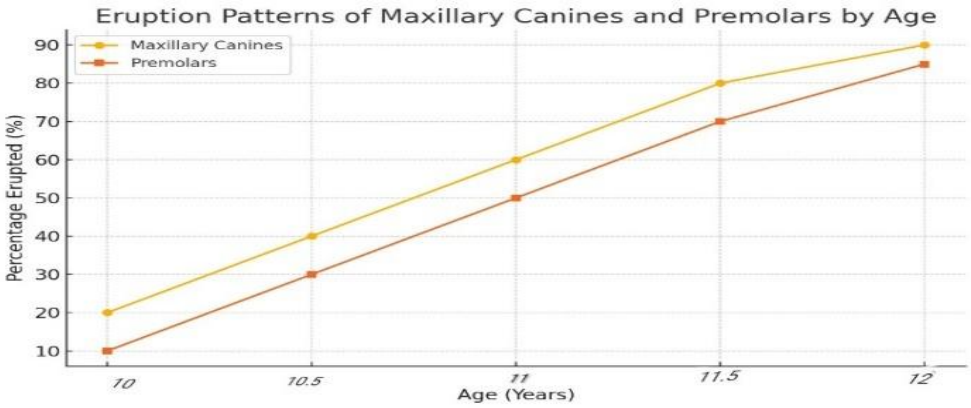

Fig 1. Eruption patterns by age among school children

The Figure shows that maxillary canine precedes the premolars in eruptions and full eruption of permanent dentition achieved by age of 12.

Picture 1: maxillary impacted canine.

Picture 2: Topical Fluoride Varnish application

Picture 3: Proper Oral hygiene practice model