

# Prevalence of Early Loss of Primary Molars among Schoolchildren Aged 5–9 years in Bangalore City: A Cross-Sectional Study

Isha Khurana, S.T. Prashanth, C.R. Sanjana, Yasin Salman<sup>1</sup>

Department of Pediatric and Preventive Dentistry, VS Dental College and Hospital, <sup>1</sup>Rajiv Gandhi University of Health Sciences, Bengaluru, Karnataka, India

## Abstract

**Introduction:** Early loss of deciduous molars has a great impact on the development of the dentition. Psychological, morphological, and functional problems may result from premature loss. Thus, early recognition and management play a crucial role in delivering effective dental treatment to the child patient. **Aim:** The purpose of the study was to evaluate the prevalence of early loss of primary molars in schoolchildren in Bangalore city, India. **Materials and Methods:** The study group included 200 children, that is, 115 boys and 85 girls. The dental examination was performed by an experienced examiner under sufficient natural light. Data including patient age and missing molars were collected, classifying the status of molars according to the WHO oral health assessment form for children (tooth). Collected data from each patient were subjected to statistical analysis to know the prevalence of early loss of primary molars. **Results:** The results showed that 31% of the sample had early loss of primary teeth with no statistically significant difference between genders. A higher prevalence was found among the 7–9-year-olds (69%), and the most commonly affected teeth were the right lower primary first molars (23%). **Conclusion:** The findings give an inference that untreated early childhood caries is the most common cause for early loss of primary molars resulting in occlusal discrepancy and functional problems. It is crucial to increase awareness among parents, pediatricians, and general dentists regarding the importance of primary teeth.

**Keywords:** Early loss, primary molars, schoolchildren

## INTRODUCTION

Universally pedodontists are responsible for active supervision of the developing dentition.<sup>[1]</sup> Premature loss of deciduous teeth can be termed as loss of primary teeth before their usual term of exfoliation<sup>[2]</sup> caused by dental caries, trauma, periodontal disease, and premature root resorption.<sup>[3]</sup> This can lead to deleterious effects such as tooth rotation, extrusion of the antagonist tooth, dental crowding, detrimental habits, craniofacial growth disturbances, and impaction of the successor tooth.<sup>[3]</sup> Furthermore, phonetic, psychological, morphological, and functional problems may also occur.<sup>[4]</sup> Primary molars have a paramount role in occlusion, phonetics, and psycho-emotional well-being; thus, they should be kept sound.<sup>[5]</sup>

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## MATERIALS AND METHODS

An observational cross-sectional study was conducted to assess the prevalence of early loss of primary molars. Before the study, ethical clearance was taken from the Ethical Committee of institution. Informed consent was obtained from the respective school headmasters and parents of the children. The study population included 200 schoolchildren (115 boys and 85 girls) of age 5–9 years in Bangalore city. The study sample was divided into two age groups of 100 each: 5–7 years (51 boys and 49 girls) and 7–9 years (64 boys and 36 girls) [Graph 1].

**Address for correspondence:** Dr. Isha Khurana,  
Department of Pediatric and Preventive Dentistry, VS Dental College  
and Hospital, KR Road, VV Puram, Bengaluru, Karnataka, India.  
E-mail: [ishakhurana202@gmail.com](mailto:ishakhurana202@gmail.com)

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All the children included in the study fulfilled the following inclusion criteria:

- 5–9 years of age
- Subjects provided informed consent wherein parents or guardians were willing to participate.

The exclusion criteria were as follows:

- Medically comprised children
- Parents or guardians not willing to participate
- Children with uncooperative behavior to receive a clinical examination.

Examination of the children was performed by a single examiner in a room reserved for the examination, under ambient light, with the aid of a wooden spatula. The data were documented in the forms specifically designed for this study.

Early loss of primary molar was recorded, classifying the status of molars according to the WHO oral health assessment form for children (tooth), 2013: A = Sound, B = Caries, C = Filled w/caries, D = Filled, no caries, E = Missing due to caries, F = Fissure sealant, and G = Fixed dental prosthesis/crown.<sup>[6]</sup>

All data were subjected to exploratory analysis. For continuous variables, the representation was using mean ± standard deviation, and discrete variables were represented using “*n*” and “%.” Some of the continuous variables were categorized and presented as discrete variables. Association between different discrete variables was found using Chi-squared test. To compare the proportion of a particular event in two groups, Z-test for proportions was used. In all the statistical test results,  $P < 0.05$  was considered statistically significant.

R software (R Foundation for Statistical Computing, Auckland, New Zealand) was used for statistical analysis.

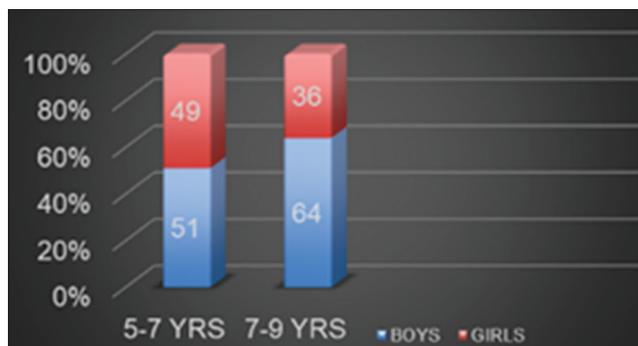
## RESULTS

Of the total number of children included in this study group, the results revealed loss of 173 primary molars among 61 participants (31%) [Graph 2]. Among the two age groups, 7–9 years had 42 participants (69%), having higher prevalence of loss when compared to 5–7 years with 19 participants (31%), which was statistically significant ( $P = 0.001$ ) [Graph 3].

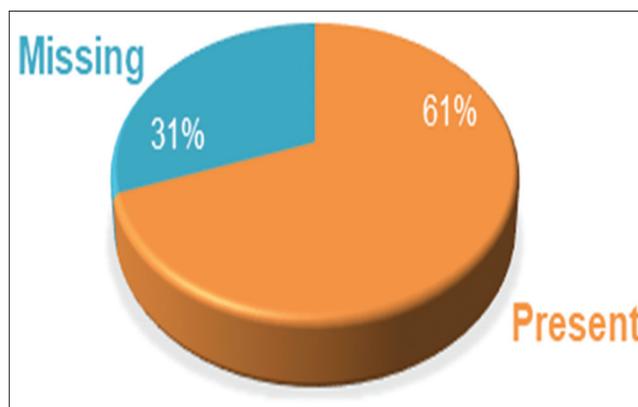
Furthermore, 37 males (61%) presented with a prevalence of early loss and 24 females (39%) were affected ( $P = 0.550$ ) [Graph 4]. The tooth with the highest loss prevalence was 84 (23%), followed by 74 (18%), 54 (14%), and 64 (11%) [Graph 5]. According to the distribution of prematurely lost teeth relative to the dental arch, the mandibular arch had loss of 107 teeth (62%) and maxillary arch had 66 teeth (38%) with early loss [Graph 6]. The study reveals a higher loss on the right side with 96 teeth (55%) affected of both the jaws [Graph 7].

## DISCUSSION

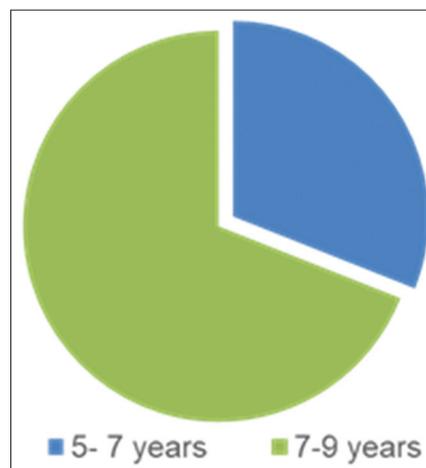
Loss of teeth is the last stage in the progression of dental caries.<sup>[5]</sup> Increased possibility of malocclusion and loss of function are the most important factors to be considered in



Graph 1: Gender of participants



Graph 2: Number of participants with missing teeth

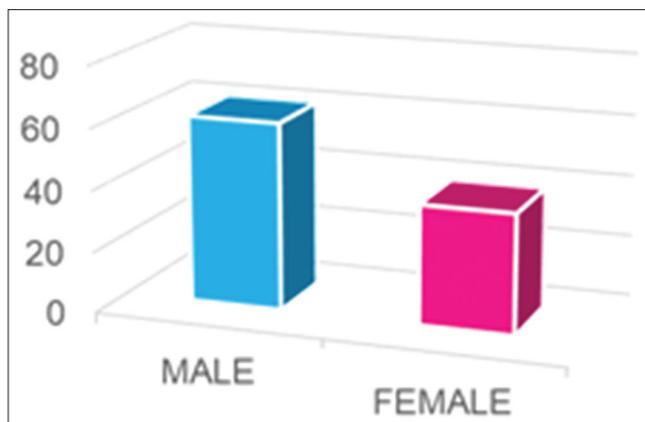


Graph 3: Age-wise distribution

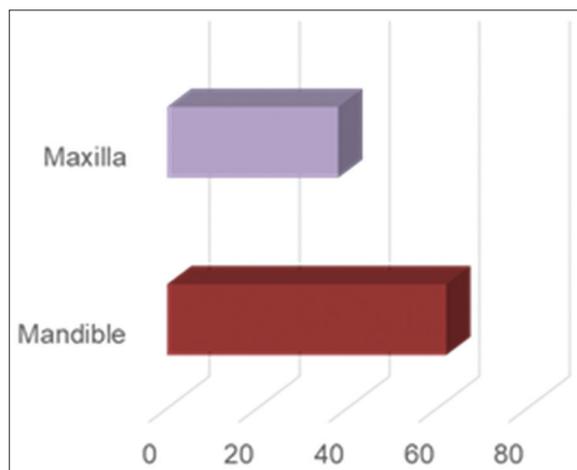
early loss of primary molars.<sup>[3]</sup> Dental decay and pulp necrosis increase the rate of root resorption and hasten the exfoliation of the deciduous dentition.

Premature extraction of primary teeth is dependent on a lot of factors that include age at the time of tooth loss, facial and dental growth potential, status of occlusion, oral habits, and study methodology.<sup>[7]</sup>

Thirty-one percent of the study population had early loss of primary molars, with males (61%) having higher prevalence



**Graph 4:** Gender-wise distribution



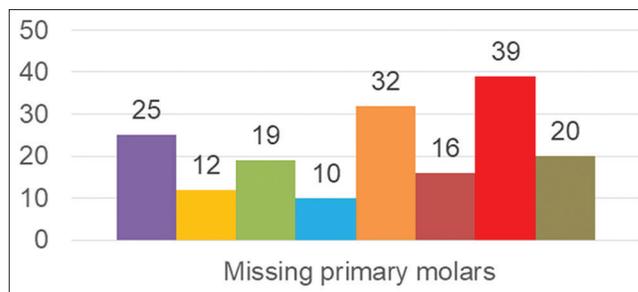
**Graph 6:** Dental arch distribution

when compared to females (39%). This was similar to a study done by Jayachandar *et al.*,<sup>[2]</sup> where 35% had early loss of primary molars and 55% affected children were males. It could be due to diet and cultural differences due to male priority prevalent in India.<sup>[8,9]</sup>

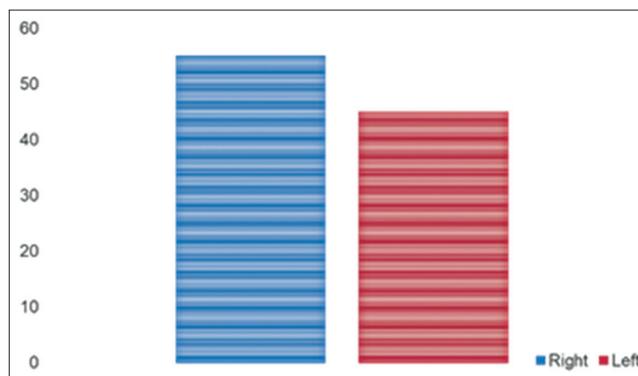
Early loss of teeth was significantly higher in the age group of 7–9 years when compared to the age group of 5–7 years ( $P = 0.001$ ). Due to lack of coordination to brush or floss their teeth on their own until about the age of 6 or 7 years, toothbrushing of children is supervised by parents until 7 years. This may be a contributing factor for comparatively lesser number of teeth affected among 5–7-year-old children.

The right lower first molar (23%) is affected maximum by early loss followed by lower left first molar (18%) which is in accordance to the study conducted by Jayachandaret *al.*,<sup>[2]</sup> Cavalcanti *et al.*,<sup>[10]</sup> and Alamoudi *et al.*<sup>[11]</sup> The primary first molars having erupted earlier, stay for longer duration of time in the oral cavity which increases their susceptibility to caries.<sup>[11]</sup>

Maxillary arch had a significantly lesser rate of early loss of primary teeth than the mandibular arch, similarly seen in Kelner *et al.*,<sup>[12]</sup> and Cavalcanti *et al.*<sup>[10]</sup> findings. According



**Graph 5:** Tooth-wise distribution



**Graph 7:** Arch side distribution

to Jayachandar *et al.*, anticarious effect seen in the upper posteriors can be attributed to immense salivary supply, whereas food lodgment and retention is more in the mandibular posteriors causing a greater risk of caries.<sup>[2]</sup>

There is a higher loss of teeth on the right side (55%) of both the jaws reflecting lack of teeth cleanliness, as to most of the population being right-handed, prophylactic methods on the left side are more effective. Hence, there is an increased tendency for plaque accumulation due to decreased toothbrushing forces on the affected side.<sup>[13]</sup>

Accumulation of *Streptococcus mutans* occurs on the fissured occlusal surfaces and concavities on the proximal surfaces of primary molars and increases as the age advances. This ultimately results in dental caries which when left untreated has to undergo extraction and hence early loss of the primary teeth.<sup>[14]</sup>

It is essential to increase oral health awareness among parents by conducting school dental health programs so that they are acquainted with deleterious effect caused due to early loss of primary molars. Thus, it is important to have a better understanding about the importance of the primary molars. If necessary, space maintainers should be advocated in children with early loss of primary molars.

## CONCLUSION

This study was an important step in providing information on early loss of primary molars, untreated early childhood caries being the most common cause resulting in malocclusion

problems. Hence, it is crucial to increase awareness among parents, pediatricians, and general dentists regarding the importance of primary teeth and preserving them until normal exfoliation.

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### Conflicts of interest

There are no conflicts of interest.

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