

Research Paper



A cross-sectional study looked into the incidence of early missing primary teeth in children aged 6 to 12 in the southern Iraqi city of Nasiriya

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Article Info

Article History:

Received: 05 January 2024

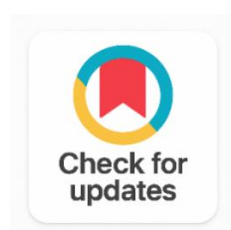
Revised: 13 March 2024

Accepted: 21 March 2024

Published: 06 May 2024

Keywords:

Missing Primary Teeth
Cross-Sectional Study
Primary School Student's
Premature Exfoliation
Southern Iraq
Prevalence



ABSTRACT

Background: The early loss of primary teeth is a pretty common childhood dental issue; it's also tied to a notable risk for problems in how the dental arch develops later. If the arch length isn't right, things like crowding can show up, and you can also see premature eruption or even impaction of the permanent teeth. That kind of situation might cause consequences that go well beyond the mouth, meaning it affects the student overall health and developmental path.

Objective: The goal was to figure out how often early primary tooth loss happens among school children aged 6–12 years, and also to look at how it spreads, by sex and by tooth type.

Methods: This was a cross-sectional study involving 259 students, 135 boys and 124 girls, ranging from 6 to 12 years. Dental assessments were done by a trained examiner, using standardized artificial lighting conditions. Patient age and the number of teeth lost prematurely were recorded in a systematic way. The data were handled with descriptive statistics, and Chi-square tests were used to check for associations, using a 5% significance threshold, $P \leq 0.05$.

Results: Early primary tooth loss occurred in both groups, and girls showed a slightly higher prevalence, 51% compared with boys at 49%. When we looked by tooth type, the first molars came up as the teeth most often involved, they made up 42.6% of all recorded early tooth losses inside the dental arch.

Conclusion: A relatively high prevalence of early primary tooth loss was found in this study group. Putting targeted oral health education in place, along with preventive intervention programs, could help children keep healthier primary dentition, so disruptions to normal occlusal development may be reduced. Also, early detection and prompt management of arch space discrepancies that happen after premature tooth loss are key steps if we want to lower the likelihood of malocclusion later in life.

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1. INTRODUCTION

For a normal permanent occlusion to be established, primary teeth must be maintained [1]. The most frequent reasons for early loss of primary teeth include poor oral hygiene, dental trauma, and tooth rot. The biggest contributing element to the high incidence of loss is still tooth decay. [2] Due to the early loss of these primary teeth in youngsters, those of us in the pedodontics and orthodontics practice commonly run into malocclusion issues [3].

One of the main things that might lead to malocclusion in the sagittal, transverse, and vertical planes is the premature loss of primary teeth [4]. According to studies, the early loss of primary teeth causes the dental arch to shorten and the antagonist and marginal teeth to move, which causes the permanent teeth to rotate, crowd, and impaction [5]. In addition, if a primary second molar rather than a primary first tooth is lost, the reduction of the dental arch length is larger in the mandible than in the maxilla [6]. Additionally, if tooth loss starts earlier in life this effect is also noticeable [7]. and if it happens in densely packed teeth as opposed to well-spaced teeth [8]. For instance, mesial migration of permanent first molars cause the arch length to be reduced as a result of early loss of primary second molar, particularly in the maxillary arch [9]. The permanent teeth in the permanent maxillary arch may need to be extracted in order to realign the dental arch, but the mandibular arch may not need to be extracted. In most circumstances necessitate long-term orthodontic treatment [10].

Early primary tooth loss in primary school students is strongly correlated with an increase in the occurrence of primary teeth extractions without further assessment of the necessity for spacing correction [11]. We made the decision to research the prevalence of early loss of primary teeth among students in primary school of Nasiriyah city due to the serious effects that result from the premature loss of primary teeth.

2. RELATED WORK

1. (Surveying the prevalence of widespread erosion, caries, and caries among kindergarten children in the city of Nasiriyah, southern Iraq) The article talks about the prevalence of tooth decay among children from 5 to 3 years of age, with a field survey of tooth erosion among those age groups.
2. (The prevalence of recurrent aphthous ulcers among students' Primary schools in the city of Nasiriyah, southern Ira) . The article includes a discussion of the spread of aphthous ulcers in children between the ages of 6 and 12 years and its causes.
3. (Bad breath, halitosis, smoking habits, and oral hygiene practices among dental students) A survey of the prevalence of poor oral hygiene, bad habits, and halitosis among dental students of various stages, comparison between females and males, and comparison with similar research in other regions of the world.
4. (Frequency and prevalence of smoking among dental students in southern Iraq) Research on the prevalence and amount of smoking among dental college students.
5. (Investigation of dental caries, poor oral hygiene practices, and malocclusion rates among adolescents enrolled in secondary schools in southern Iraq) Statement of poor eating habits and caries Teeth and their impact on malocclusion among adolescent students between the ages of 14 and 17 years.

3. METHODOLOGY

During the 2017–2018 academic years, a cross-sectional survey was carried out on all primary school students in Nassiriya city, southern Iraq, aged 6 to 12 years. All students (n = 259) enrolled in Al-Fayhaa Primary School were given the opportunity to take part in the study. By means of a written communication in the hands of the students, for the consent of the parents of the children, and with a thorough explanation of the type of study, its purpose, and the specifics of the examination process, all students who met the study inclusion criteria (a) 6 to 12 years of age and (b) consent from a parent or guardian to participate in the study were invited to participate. Students who didn't have their parents' written authorization before participating in the study by writing communication in the students' possession, with the parents' permission, and after a thorough description of the nature and goals of the study as well as the specifics of the examination procedure. Students who did not have their parents' formal authorization to engage in the study were not allowed to participate. Individual interviews done by the researcher on the day of the dental exam allowed for the thorough documentation of each participant's personal information and general health. A single examiner conducted the dental examination in good artificial light. There were wooden spoons, masks, and gloves utilized. Early loss was classified using Kronfield's hypothesized timetable for the eruption of permanent teeth, [12] and falling by a year, as Cardoso et al. anticipated. [13] Models created especially for this study served as the documentation for the data. Age, gender, general health, oral hygiene, daily tooth cleaning after meals, and the kind of missing teeth were all taken into consideration.

The Statistical Package for Social Sciences, version 10, was used to conduct all statistical analyses (SPSS Inc., Chicago, Illinois, USA). To determine the absolute and percentage frequency, descriptive statistical techniques were applied to the data. At a threshold of significance of 5% (P 0.05), chi-square tests were used to confirm the existence of significant relationship among the variables.

4. RESULTS AND DISCUSSION

4.1. Result

Through the number of students included in the study group, which numbered only (259), 126 (48.64%) lost primary teeth prematurely, as the number of boys missing primary teeth was 62 boys with a percentage of 49% and in girls the number was 64 with a percentage of 51% so there is a slight increase in girls than boys, the peak prevalence was recorded at approximately 11 years of age [Table 1].

Table 1. Distribution of Individuals Who Have Early Tooth Loss by Age and Gender

Age by Years	6	7	8	9	10	11	12	Total, PPP, N (%)
Gender								
Boys	2(3)	5(4)	8(5.3)	9(7.2)	12(8.1)	14(9.7)	12 (11.7)	62(49)
Girls	1(1.3)	3(2.3)	8 (5.2)	9 (7.3)	11(9.5)	16(12.2)	16 (12.2)	64(51)
Tota	3(4.3)	8(6.3)	16(10.5)	18(14.5)	23 (17.6)	30(22.9)	28(23.9)	126(100)
% [^] =5.163,df=3,p=0.365,PPP= prevelance loss of primary teeth								

From the study outputs we found a total of 126 primary teeth lost prematurely in a total percentage (48.64%) of the total pupils studied [Table 2] with the highest loss rate per the FDI primary tooth numbering system.

Table 2. Gender Differences in the Distribution of Primary Teeth That Lost the Most Early

Tooth	Gender	Total PPP, N(%)
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	Boys PPP, N (%)	Girls PPP, N(%)	
51	1(1.4)	1(1.4)	2 (2.4)
52	2 (1.2)	4 (2.8)	6 (4)
53	6 (3.2)	6 (3.2)	12 (6.4)
54	6 (3.2)	4 (2.6)	10 (5.8)
55	2 (1.2)	1 (1.1)	3 (3.3)
61	2(1.2)	1 (1.1)	9 (2.3)
62	3(1.9)	4 (2.1)	4) (7
63	6 (3.2)	8 (3.6)	14(6.8)
64	5 (2.9)	3 (1.9)	(4.8) 8
65	7 (3.5)	0 (0)	7(3.5)
71	3 (1.9)	5 (2.8)	(4.7) 8
72	2(1.2)	(2.1) 4	6(3.3)
73	3(1.9)	5 (2.8)	4.7)(8
74	6 (3.2)	8 (3.6)	6.8)(14
75	6 (3.2)	9 (4)	15(7.2)
81	0 (0)	0(0)	(0) 0
82	6(3.2)	4(2.1)	(5.3) 10
83	6(3.2)	11 (4.4)	17(7.6)
84	8(3.6)	15 (5.9)	9.5)(23
85	9(4.4)	9 (4.4)	10.2) (18
Total	58(48.7)	68(51.3)	126(100)
PPP= prevalence loss of primary teeth , Number of percentage = n(%)			

In terms of the percentage of students who had lost teeth enough early, 49 students (41%) had one missing tooth, 35 students (28.7%) had two missing teeth, 19 students (15.3%) had three missing teeth, 7 students (5.3%) had four missing teeth, 6 students (4.4%) had five, 4 students (4.1%) had six missing teeth, and 1 student (1.2%) had eight missing primary teeth.

The molars (67.5%) were the most frequently lost teeth, with the first molar accounting for the largest percentage of these cases (42.6). Incisors and canines were the next most frequently lost teeth after the molars, at a rate of (23.2%) and (9.3%), respectively, according to [Table 3, Table 4].

Table 3. According to Tooth Types (Central Incisors, Lateral Incisors, Canine, First Molars, Second Molars), The Distribution of Primary Teeth That Were Lost Too Soon Varies by Gender

Tooth Type	Gender		Total PPP, N(%)
	Boys PPP, N (%)	Girls PPP, N(%)	
Central incisors	4 (5.8)	6.8)(5	9 (12.6)
Lateral incisors	4 (5.8)	3 (4.8)	7 (10.6)
Canine	2 (3.5)	4 (5.8)	6 (9.3)
First molars	33 (20.2)	37 (22.4)	70 (42.6)
Second molars	11.2) 15(	19 (13.5)	24.9) (34
Total	58 (46.5)	68 (53.5)	126 (100)
% ^Λ =5.163,df=3,p=0.365,PPP= prevalence loss of primary teeth			

Table 4. Distribution of the Tooth Types (Incisors, Canine, and Molars) That Were Affected by Early Tooth Loss in Relation to Gender

	Gender	Total PPP, N(%)
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Tooth Type	Boys PPP, N (%)	Girls PPP, N(%)	
Incisors	8 (11.6)	11.6)(8	16 (23.2)
Canine	2 (3.5)	4 (5.8)	6 (9.3)
Molars	48 (31.4)	56 (35.9)	104 (67.5)
Total	58 (46.5)	68 (53.5)	126 (100)
% [^] =5.163,Df=3,P=0.365,PPP= Prevalance Loss Of Primary Teeth			

The distribution of missing teeth by dental arch is shown in [Table 5, Table 6] they show that the mandibular arch (54%) had more cases than the maxillary arch (46%). The most primary teeth were lost (27.4%) in the mandibular right quadrant.

Table 5. In Relation to Dental Quadrants and Gender, the Distribution of Primary Teeth That Were Lost Early

Dental Quadrant	Gender		Total PPP, N(%)
	Boys PPP, N (%)	Girls PPP, N(%)	
Right quadrant of maxilla	12 (11)	11.4)(14	26 (22.4)
Left quadrant of maxilla	14(11.4)	17 (12.2)	31(23.6)
Right quadrant of mandible	19 (15.3)	16 (12.1)	35 (27.4)
Left quadrant of mandible	16(12.1)	18 (14.5)	34 (26.6)
Total	61 (49.8)	65 (50.2)	126 (100)
% [^] =5.163,df=3,p=0.365,PPP= prevalence loss of primary teeth			

Table 6. In Relation to Dental Arches and Gender, the Distribution of Primary Teeth That Were Lost Early

Dental Arch	Gender		Total PPP, N(%)
	Boys PPP, N (%)	Girls PPP, N(%)	
Maxilla	26 (22.4)	23.6)(31	57(46)
Mandible	35 (27.4)	34 (26.6)	69 (54)
Total	61 (49.8)	65 (50.2)	126 (100)
% [^] =5.163,df=3,p=0.365,PPP= prevalence loss of primary teeth			

4.2. Discussion

Particularly in cases of early loss of primary teeth among primary school students, there was a noticeable increase in the prevalence of primary tooth extraction that was not followed by space maintenance. With no interest in generalizing our findings to Total primary school students in the cities of southern Iraq, the main goal of this cross-sectional study is to provide a thorough overview of the early loss of primary dental status in the target sample in order to predict future healthcare needs in preventing disturbances in the normal development of occlusion in children. Additionally, to our knowledge, this study is the first to examine this issue among elementary school pupils in the southern Iraqi city of Nasiriya. Our study found a significant prevalence rate (48.64%) of early primary tooth loss in the study group, which is comparable with a recent Saudi Arabian study. [14] A sample of pupils from Al-Fayhaa Primary School in the southern Iraqi city of Nasiriya served as a representation of the early loss of primary teeth in the current study. We may therefore anticipate that these pupils do not require dental care any more frequently than other elementary school students in general.

This conclusion can also be drawn from the fact that parents and occasionally some dentists fail to emphasize the value of a child's primary teeth or accord them the same weight as permanent teeth. These people could believe that preventing and treating deciduous teeth is unnecessary because they would eventually be replaced [15], which could account for the high risk of early tooth loss in the current study.

The recent study also revealed that there is no statistically significant difference between boys and girls in the early loss of primary teeth. Although there is a little tendency (2%) for girls to outnumber boys, this small tendency is not thought to be significant. This outcome was consistent with earlier research. [16] This finding suggests that oral hygiene issues, not gender, are to blame for the research group's early loss of primary teeth.

Similar to what was discovered in a prior study, the majority of students in this study had one or two teeth that had fallen out early. Similar to earlier studies, the current study found that early tooth loss peaked at age 11 and that main molars lost teeth more frequently than other primary teeth [17]. The lower right first primary molars were the teeth that were missing the most; however, we concur with the study that they are molars and that they are located in the lower jaw. This finding differs from the findings of the previous study, which assumed that the lower left second primary teeth are the most likely to be lost.

This conclusion could be explained by the fact that newborns are more likely to acquire *Streptococci mutans* as they age or as their number of erupting teeth rises. [18] Because they erupt into the oral cavity between the ages of 1.5 -2 years and have an impact on both concave approximal surfaces and fissured occlusal surfaces, the primary molars may be particularly vulnerable to the early colonization of *S. mutans*. [19] *S. mutans* is more likely to colonize occlusal fissures than smooth surfaces [18].

This may lead to primary molar caries, which, if addressed, could lead to early extraction and contribute to early loss. In addition, we noted a higher incidence in the mandibular arch by examining the distribution of early loss on the arches. These results agreed with earlier research. [20] The greater potential for food packing and increased plaque buildup in the mandibular posterior region may be the cause of the mandibular arch's greater loss of primary teeth. Additionally, the maxillary molar teeth have relatively high levels of saliva, which has anticaries characteristics, lowering the rate of early tooth loss [21].

Early primary tooth loss might lead to issues owing to function loss and a higher likelihood of other teeth migrating. With passing time from the point of extraction, compartment closure occurs more frequently. [16] The rate of vacuum closure is higher for the upper jaw than the lower jaw, although it starts to decline after the first six months, according to earlier studies. Therefore, it is crucial to educate adolescents about the value of oral health and to warn parents about the possibility of malocclusion issues as a result of the early loss of primary teeth in primary second molar extractions [22]. Parents of young children who lost their primary teeth should be encouraged to take their kids to the dentist to have space maintainers if necessary [23].

The fact that the sample size was tiny is the primary drawback of this study. This study sample might not accurately represent the extent of early primary tooth loss among students in other Iraqi schools, hence it shouldn't be generalized. To solve this issue and observe big student cohorts from various places, additional research is required in order to draw a valid conclusion. This will be considered by the study team in subsequent investigations.

5. CONCLUSION

The Findings of this Study Allow for the Following Inferences:

- Early primary tooth loss was common (48.64%) and more prevalent in children under the age of 11 years.
- (41%) of students have just one lost tooth.
- The mandibular arch (54%) lost more teeth than another arch.
- The most frequent missing tooth is the first primary right lower molar by (4.62%).

In the study population, early loss of primary teeth occurred often. In view of recent research that has shown malocclusion issues to be connected to the early loss of deciduous teeth, this finding is significant. Therefore, it is essential to develop oral health awareness among students and their parents in order to inform them of the value of deciduous teeth, how to care for them, and the negative effects of losing primary teeth too early. Parents of primary school students who lost their deciduous teeth should be instructed to take their kids to the dentist so that, if necessary, a space maintainer can be given to them.

Acknowledgments

The authors have no specific acknowledgments to make for this research.

Funding Information

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Ghazwan Hasan Jasim	✓	✓	✓	✓		✓		✓	✓	✓	✓			

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

Conflict of Interest Statement

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Informed Consent

All participants were informed about the purpose of the study, and their voluntary consent was obtained prior to data collection.

Ethical Approval

Not Applicable.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

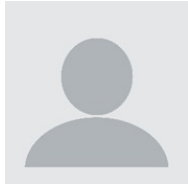
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How to Cite: Ghazwan Hasan Jasim. (2024). A cross-sectional study looked into the incidence of early missing primary teeth in children aged 6 to 12 in the southern Iraqi city of Nasiriya. Journal Healthcare Treatment Development (JHTD), 4(1), 83–91. <https://doi.org/10.55529/jhtd.42.33.42>

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