

Parental Knowledge and Practice Associated with Dental Carries in Thalassemia Children 6 -12 Years old Attending at Children Hospital, Vientiane Capital, Lao PDR

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Abstract

Background: Thalassemia is an inherited haematological disorder characterized by abnormal haemoglobin synthesis, which often leads to skeletal deformities, including those affecting the craniofacial bones and jaws. These structural changes can result in dental malocclusion, subsequently increasing the risk of dental caries, gingivitis, and periodontal inflammation. This study aimed to investigate parental knowledge and practices associated with dental caries indices (dmft and DMFT) among children aged 6–12 years with thalassemia at the Children’s Hospital in Vientiane Capital, Lao PDR.

Methods: A cross-sectional, quantitative study was conducted involving 375 children with thalassemia registered for day care at the Children’s Hospital. Data were collected through face-to-face interviews covering

socio-demographic characteristics, medical history, and parental knowledge and behaviours regarding paediatric oral healthcare. Data analysis was performed using Epi Data version 3.1 and STATA version 13. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were utilized. Bivariate and multiple logistic regression analyses were employed to identify significant associations, with results reported as Odds Ratios (OR) with 95% Confidence Intervals (CI) and a significance level of $P < 0.05$.

Results: The study population was predominantly female (55.5%), with 63.7% of participants aged between 6 and 8 years. The prevalence of dental caries was notably high, affecting 86.9% of children with permanent teeth and 92.8% of those with primary (milk) teeth. Key factors significantly associated with oral health outcomes

included the 9–12 age group (OR = 0.12; 95%, CI: 0.05 - 0.25, $P < 0.001$), parental oral health behaviours (OR = 2.66; 95%, CI: 1.28 - 5.52, $P < 0.008$), and parental practices regarding professional dental visits (OR = 0.45; 95%, CI: 0.23 - 0.89, $P < 0.001$).

Conclusion: The prevalence of dental caries is critically high among thalassemia children aged 6–12 years in both primary and permanent dentitions. These findings underscore the urgent need for comprehensive oral health strategies and preventive programs tailored for children admitted to the hospital.

Keywords: Oral Health, Dental Caries, Parental Knowledge and Practice, Thalassemia.

Introduction

Dental caries is recognized as a major global health concern, frequently leading to adverse physical health outcomes, including malnutrition. This occurs because affected children often struggle to maintain adequate nutritional intake, resulting in body weights below standard developmental milestones (Calcagnile et al., 2019). Furthermore, dental caries remains a prevalent oral health issue across all age groups, particularly among preschool children and those aged 6–12 years (Jain et al., 2015).

Oral diseases represent a significant category of non-communicable diseases that continue to pose a substantial public health challenge. Research indicates that children with anaemia are particularly susceptible to oral health complications; for instance, mild periodontitis was observed in up to 66.7% of this demographic, while moderate cases accounted for 33.3%. Additionally, the prevalence of gingivitis reached 64.8%, followed by periodontitis at 33.0%. Notably, only 1.8% of individuals in these studies maintained optimal oral health (Arabsolghar et al., 2015).

The incidence of dental caries is also strikingly high among children with specific medical conditions. Ibrahim et al. (2019) reported a prevalence of 80.8% in children with thalassemia, while a 2017 study found that 51.2% of children suffered from dental caries (Farsi et al., 2017). Regional studies further highlight the severity of the issue: Syria: 94% prevalence among children aged 6–12 (Ibrahim, 2021). Afghanistan: 93.9% prevalence in children with beta-thalassemia (Shadlinskaya & Zeynalova, 2019). Thailand (KhonKaen University): 88.5% prevalence in children with beta Thalassemia and alpha Thalassemia (Weeraarchakul & Jetsrisuparb, 2010). Parental knowledge serves as a foundational element in fostering positive oral hygiene habits in children. A 2020 study in China emphasized that parental awareness is critical for ensuring children's dental well-being (Chen et al., 2020). Similarly, international research suggests that guardians with higher levels of health literacy play a decisive role in improving their children's oral health outcomes (Sitthisetpong et al., 2021; Ahmadzadeh et al., 2015). In India, enhanced parental knowledge was significantly correlated with the ability to correctly instruct children on oral maintenance ($P < 0.05$) (Paxar et al., 2018).

Furthermore, parental health-seeking behaviour—specifically taking children for dental consultations is a statistically significant factor in preventing tooth decay. Studies in Taiwan and India both demonstrated a strong correlation between regular dental visits and lower rates of caries ($P = 0.001$) (Liu et al., 2017; Thakur et al., 2017). Parental age also appears to influence oral health management; research in the UAE ($P < 0.04$) and India ($P < 0.05$) indicates that older parents, particularly those aged 30 and above, tend to be more effective in maintaining their children's dental hygiene (Abugharbieh et al., 2019; Chowdhury & Chakraborty, 2017).

In 2014, the Lao PDR integrated oral health into its national health policy. The Ministry of Health identified dental caries as a priority within its preventive and curative care frameworks, recognizing that oral health is inextricably linked to the overall quality of life of the population (Akkhavong et al., 2014).

Methodology

Study Population and Sampling

This cross-sectional study was conducted among 375 children with thalassemia, aged 6–12 years, who were registered at the Thalassemia Division of the Children’s Hospital in Vientiane Capital, Lao PDR. The research employed a mixed-methods approach, combining quantitative and qualitative analysis, with data collection spanning from January to December 2025.

A purposive sampling method was used to select the participants. The required sample size was determined based on the following formula for estimating a single proportion:

$$n = \frac{z_a^2 p(1 - p)}{e^2}$$

n= is the sample size proportion.

Za= is the standard normal distribution value at 95% confidence level (a =0.5) is equal to 1.96

p= is the proportion of children with dental caries is 28.6% = 0.286

e= is the precision of the estimate =0.05

The research instrument, a structured questionnaire, underwent a rigorous validation process. Content validity was assessed by three experts, yielding an Index of Item-Objective Congruence (IOC) ranging from 0.67 to 1.00. Reliability testing showed a Cronbach’s Alpha of 0.957, indicating high internal consistency, with a discriminatory power of 0.45. Following minor adjustments based on expert feedback, the questionnaire was finalized for administration.

Data Collection and Analysis

Quantitative data were gathered via questionnaires distributed to parents, which took approximately 10–15 minutes to complete. Qualitative data were obtained through a comprehensive review of children’s health records, focusing on documented symptoms and clinical conditions.

Data analysis was performed using Stata version 11. Descriptive statistics, including percentages, were used to summarize the data. To determine statistical significance, Multiple Logistic Regression was employed. Variables with a $P\text{-value} < 0.05$ in the univariate analysis were included in the final model. Results are presented as Adjusted Odds Ratios (AOR) with 95% Confidence Intervals (CI), and significance was set at $P < 0.05$.

Result

General Information

The analysis of data from 375 guardians revealed that a significant majority were female (72.3%), primarily consisting of mothers or grandmothers who accompanied the children for examination. The mean age of the guardians was 37.2 ± 7.64 years. Approximately two-thirds of the participants fell within the 31–45 age group (64.3%). Regarding educational attainment, 28.8% had completed upper secondary school, while 18.4% had completed primary education. In terms of occupation, the most prevalent category was housewife (30.6%), followed by trading/commerce (26.6%), whereas private sector employees represented the smallest proportion at 4.3%. The vast majority of participants were of Lao ethnicity (97.0%), with the remainder composed of Lao Soung (Hmong) and Khmu at 1.4%, 0.8%, and 0.8%, respectively. More than half of the households (56.2%) reported a monthly income exceeding 1,500,000 kip. Furthermore, 54.9% of parents had more than two children, and 92.5% of the children were diagnosed with

thalassemia. The majority of the child participants were female (55.5%), with 63.7% aged between 6 and 8 years. The mean age of the children in this study was 8.1 years,

with ages ranging from a minimum of 6 years to a maximum of 12 years (refer to Table 1).

Table 1: General information

Variable	n= 375 ຄົນ	(%)
Sex		
Female	271	72.3
Male	104	27.7
Age group		
21 – 30 ປີ	76	20.3
31 - 45 ປີ	241	64.3
46 -59 ປີ	58	15.4
Mean = 37.2 SD = 7.64 Min = 21 Max = 59		
Education level		
None	8	2.2
Primary school	69	18.4
Secondary school	67	17.8
Upper secondary school	108	28.8
Lower bachelor	56	14.9
Bachelor	65	17.3
Higher bachelor	2	0.6
Occupation		
Famer	22	5.9
Staff	91	24.3
Private staff	16	4.3
Commerce	100	26.6
Housewife	115	30.6
Worker	31	8.3
Ethnic group		
Lao	364	97
Hmong	3	0.8
kmou	3	0.8
Laothong	5	1.4
Monthly Family income		

Variable	n= 375 ຄົນ	(%)
≤ 1.500.000 kip	164	43.8
> 1.500.000 kip	211	56.2
Family member		
< 4	202	53.8
> 5	173	46.2
Child number		
1 child	97	25.9
2 children	206	54.9
>3 children	72	19.2
Child information		
Sex		
Female	208	55.5
Male	167	44.5
Age		
6 - 8 y	239	63.7
9 -12 y	136	36.3
Mean = 8.1 SD = 2.084 Min = 1 Max = 12		

Parents' Knowledge Regarding Risk Factors for Dental Caries

Regarding the comprehension of the aetiology of dental caries, it was observed that the question most frequently answered correctly by guardians pertained to the significance of dentition to systemic health, yielding a correct response rate of 97.6%. This was followed by knowledge of the primary causes of tooth decay namely, inadequate oral hygiene, consumption of cariogenic (sugary) foods, and the presence of oral bacteria which achieved a correct response rate of 89.8%.

However, 73.8% of guardians (nearly four-fifths) held the misconception that dental caries is primarily caused by

genetics, sharing toothbrushes, or the practice of pre-chewing food for children. Knowledge Assessment Summary: The evaluation of guardians' knowledge scores was categorized using a specific threshold: High Knowledge: A score of 80% or higher (8 points). Low Knowledge: A score below 80% (< 8 points). The findings indicated that 84.5% of guardians demonstrated a High/Good level of proficiency regarding the causes of tooth decay, while 15.5% were classified as having a Low level of knowledge. (Refer to Table 2 for comprehensive details).

Table 2: Guardians' Knowledge of Risk Factors for Dental Caries

Variable /questionnaires	Incorrect N(%)	Correct N(%)
Importance of teeth as a vital component of the body	9 (2.4)	366 (97.6)
Etiology of decay: poor hygiene, sugary foods, and microorganismes	38 (10.2)	337 (89.8)
Decay attributed to genetics, sharing toothbrushes, or pre-masticating Food*	98 (26.2)	277 (73.8)
A person with a toothache must have symptoms such as a swollen cheek, swollen eyes or red and swollen gums with pus.	71 (18.9)	304 (81.1)
Tartar stay on the teeth for a long time can cause tooth decay *	70 (18.7)	305 (81.3)
If a guardian has tooth decay, will it increase the chance of the child having tooth decay as well *	61 (16.3)	314 (83.7)
Knowledge level of guardians regarding the cause of tooth decay		
Low knowledge level (<80%)	58	15.5
High knowledge level (≥80%)	317	84.5
Mean = 5.174667; SD = 1.190323 Min = 1 Max = 6, KR20 = 0.5656		

Remark: * Negative/Reverse-scored question.

Parental Knowledge Regarding the Prevention of Dental Caries in Children

Regarding parental knowledge on the prevention of tooth decay—assessed through a 9-item questionnaire—it was found that the statement answered correctly most frequently (96.2%) was: "Dentists play an important role in preventing dental caries." This was followed by 94.4% of respondents correctly identifying that toothaches and tooth loss caused by decay are preventable. Conversely, the item with the lowest correct response rate (78.4%)

pertained to whether avoiding snacks such as sweets, bread, and soft drinks can prevent dental caries.

The summary of preventive knowledge revealed that the majority of parents possessed a high level of knowledge concerning the prevention of tooth decay in children, with an average score of 8.1 (SD = 1.22). When categorized, the proportion of respondents with a high level of knowledge was 90.4%, while those with a low level of knowledge accounted for only 9.6%. (Detailed data is provided in Table 3).

Table 3: Parental knowledge regarding the prevention of dental caries in children

Variable/quationairs	Incorrect (%)	Correct (%)
Dentists play an important role in preventing dental caries	14 (3.8)	361 (96.2)
Toothache and tooth loss caused by dental caries can be prevented	21 (5.6)	354 (94.4)
Children should clean their mouths and teeth just like adult	27 (7.2)	348 (92.8)
It is necessary to take children for oral and dental health check-up	37 (9.9)	338 (90.1)
Brushing teeth is a primary way to preventoral and dental diseases	39 (10.4)	336 (89.6)
It is necessary for children to brush their teeth every morning and belor bed.	36 (9.6)	339 (90.4)
If a child’s tooth decay is left untreated, it will be affected to their oral and physical health	38 (10.2)	337 (89.8)

Taking a child for a dental check up early on result in better prevention and treated	29 (7.8)	346 (92.2)
Avoiding snacks such as sweets, bread and soft drinks can prevent dental caries	81 (21.6)	294 (78.4)
Overall knowledge level on dental caries prevention		
Low knowledge level (<80%)	36	9.6
High knowledge level(≥80%)	339	90.4
Mean = 8.141333; SD = 1.227, Min = 1 Max = 9, KR20 = 0.5603		

Guardian Behaviours in Paediatric Oral Health Care

The study examined the practices of guardians regarding their children's oral hygiene. Findings indicated that the most prevalent recommendation for brushing frequency was twice daily specifically in the morning and before bedtime at 69.0%. Conversely, the least common practice was brushing three times a day (morning, after meals, and before bed), accounting for only 4.9%. Overall, the majority of children (69.6%) adhered to a twice daily brushing routine, while only 4.6% brushed three times per day. Regarding specific hygiene techniques, more than half of the parents (54.6%) did not advise their children to brush their tongues. In terms of dental products, 70.4% of children regularly used fluoride-containing toothpaste, whereas 13.9% of parents were uncertain about the fluoride content in the products used. The study further

identified prevalent brushing methods and post meal habits: Brushing Technique: The horizontal brushing method was the most common (46.4%), while the multi-directional technique (up, down, and across) was the least utilized (18.7%). Post-Meal Hygiene: After eating, nearly half of the children (49.3%) performed no oral cleaning. This was followed by 31.2% who used mouthwash, while dental floss was the least utilized method at only 2.4%. Summary of Parental Behaviours: The overall assessment revealed that parental involvement in preventive oral health care was suboptimal, with an average behavioural score of 12.0 (±1.458). When categorized, more than half of the guardians (62.1%) exhibited poor oral health behaviours, whereas only 37.8% were classified as having good behavior patterns. (Detailed data is provided in Table 3).

Table 4 : Behavior of gardians in caring for the oral health of children

variable	Number (n =375)	Percentage(%)
When did you advise the Child to brush		
- Morning	98	26.1
- Morning and befor bed	259	69.0
- Morning, after meals and befor bed	18	4.9
Frequency of brushing per day		
- 1 time	97	25.8
- 2 times	261	69.6
- 3 times	17	4.6
When your Child brushes their teeth, do you let them brush their tongue?		
- Yes	170	45.4

- No	205	54.6
Does the toothpaste you give your child regularly contain fluoride?		
- Yes	264	70.4
- No	59	15.7
- Not sure	52	13.9
How does the child brush their teeth		
- Up and down	131	34.9
- Across	174	46.4
- Up, down and across	70	18.7
How does the child clean their teeth		
- Mouthwash	117	31.2
- Dental floss	9	2.4
- Toothbrush	51	13.6
- Not done	185	49.3
- Toothpick	13	3.5
Parental Behaviors in Maintaining Children's Oral and Dental Health		
- Low Behaviors (<80%)	233	62.1%
- High Behaviors (≥80%)	142	37.8%
Mean = 11.97 sd = 1.4586 Min = 7 Max = 16, KR20 = 0.5796		

Parental Behavior Regarding Pediatric Dental Consultations

According to the data presented in Table 5, an analysis of parental health-seeking behavior reveals that 53.1% of guardians had previously taken their children for professional dental services. Among this group, the primary reasons for consultation included fillings (45.8%), followed by extractions (35.7%), and general oral health check-ups (23.7%). Only a marginal proportion (3.5%) sought services for scaling (prophylaxis). Regarding the choice of healthcare provider:

Central hospitals were the most utilized facilities, accounting for 50.2%. Private clinics followed closely at 46.8%. In terms of visit frequency, a significant plurality of guardians (44.7%) reported taking their children for

check-ups every three months, while 26.2% attended annually. Conversely, the lowest frequency recorded was for visits occurring less than once a year (9.6%).

Furthermore, while 53.8% of guardians adhered to an annual dental visit schedule, a smaller segment (17.5%) sought consultations three times per year. Notably, 46.9% of guardians reported that they had never utilized dental services for their children. The predominant reason cited for this lack of utilization was the absence of dental pain (36.2%), followed by the presence of only minor discomfort (31.6%). A negligible minority (2.3%) resorted to self-medication when pain occurred.

Table 5: Parental behavior in taking children to see the dentist

Variable	Person (N =375)	Percentage(%)
Have you ever take the child to see dentist		
- Never	176	46.9
- Ever	199	53.1
Reasons for not seeing dentist (n=176 people)		
- Not time due to work	46	29.4
- A little bite pain and better itself	55	31.6
- Buy medicine	4	2.2
- not hurt	63	36.2
Reasons for taking children to the dentist (multiple answers allowed) (n=199)		
- Filling	91	45.8
- Extract	71	35.7
- Tartar scaling	3	1.5
- Oral health check-up	47	23.6
Taking children to see the dentist for one year ago		
- 1 time	107	53.8
- 2times	57	28.6
- 3 times	35	17.6

Deciduous and Permanent Teeth with Caries(d)(D)

A study of 375 children with Thalassemia examined the prevalence of dental caries (D) in both deciduous and permanent teeth. The findings indicated that 30.9% of the participants had decay in their permanent teeth. Among this subgroup: The maximum number of decayed teeth recorded was 5 (0.3%). This was followed by 4 decayed teeth, found in 3.7% of the children. The lowest frequency was 1 decayed tooth, observed in 7.2% of the sample.

Regarding deciduous teeth (baby teeth), the caries rate was significantly higher than that of permanent teeth, standing at 78.4%. Within this group: The highest incidence was 12 teeth with caries, occurring in 3 children (1.0%). This was followed by 11 teeth with caries in 1 child (0.3%), and 8 teeth with caries in 14 children (3.7%). The lowest frequency recorded was 1 tooth with caries, found in 27 children (7.2%).

(Detailed data is provided in Tables 6 and 7).

Table 6: permanent with caries (D)

Variable/dental caries	Number of teeth	Person N/ (%)
None	0	259 (69)
carie	1	27 (7.2)
carie	2	71 (18.9)
carie	3	3 (0.8)
carie	4	14 (3.8)
carie	5	1 (0.3)

Table 7: Primary with caries (d)

Variable/dental caries	Number of teeth	Person n=375 (%)
None	0	81 (21.6)
carie	1	27 (7.2)
carie	2	74 (19.7)
carie	3	41 (10.9)
carie	4	65 (17.3)
carie	5	23 (6.1)
carie	6	34 (9.1)
carie	7	8 (2.1)
carie	8	14 (3.7)
carie	9	1 (0.3)
carie	10	3 (1.0)
carie	11	1 (0.3)
carie	12	3 (1.0)

Number of primary and permanent teeth were extracted (m)(M)

The least proportion of permanent teeth were extracted found 2 teeth in 1 child (0.3%), the number of teeth were not extracted as high as 374 Person was 99.7%. while deciduous teeth were extracted at 18.7%. The most extracted teeth were 4 teeth in 2 children (0.6%), 3 teeth in 5 person (1.3%), 2 teeth in 32 person (8.5%), and 1 tooth in 31 person (8.3%) (details in Tables 8 and 9).

Table 8: number of primary and permanent teeth were extracted (m)(M)

Variables/ Missing teeth (M)	Person/ n=375	(%)
Missing teeth 0	374	99.7
Missing 2	1	0.3

Table 9: number of primary teeth were extracted (m)

Variables/ Missing teeth (M)	Person/ n=375	(%)
missing 0	305	81.3
missing 1	31	8.3
missing 2	32	8.5
missing 3	5	1.3
missing 4	2	0.6

Number of permanent teeth were filled (F)

At least percentage of permanent teeth were filled (F) due to caries were only 6.4%, while 0.3% had 3 teeth in 1 person was filled, 2 teeth in 12 people was 3.2%, and at least was 1 tooth in 11 people was 2.9%. Those deciduous teeth were 12.0%.

There were 4 teeth to be filled in 2 people (0.5%), followed by 3 teeth in 3 people (0.9%), and 1 tooth in 9 people (2.4%). Details are in Tables 11 and 12.

Table 11 : Number of permanent teeth were filled (F)

Variables/ Missing teeth (M)	Person/ n=375	(%)
Filling teeth 0	351	93.6
Filling teeth 1	11	2.9
Filling teeth 2	12	3.2
Filling teeth 3	1	0.3

Table 12: Number of primary teeth were filled

Variables/ Missing teeth (M)	Person/ n=375	(%)
filling teeth 0	330	88.0
filling teeth 1	9	2.4
filling teeth 2	31	8.2
filling teeth 3	3	0.9
filling teeth 4	2	0.5

Parental knowledge associated with dental caries in thalasemia child

Parental knowledge about factors dental caries and prevention was not associated with dental caries occurred with thalassemia child in 6-12 years group (P –Value >0.05). (Details in Table 13)

Table 13 : Parental knowledge associated with dental caries in thassemia child

Variable	Status of teeth		OR	95%CI		P-value
	None decay	decay		Lower	upper	
	N(%)	N (%)				
Parents' knowledge about the risk factors for dental caries in children						
Lower	6 (5.5)	104 (94.5)	1			
uppeer	16 (6.1)	249(93.9)	1	0.3	2.6	0.983

Parental behavior associated with take care oral and teeth for their children with thalasemia

Parental behavior oral health in children found that who had never taken their children to take care dental services at various places before had a 3.2 times higher risk of developing tooth decay compared to children whose parents had taken their children to take care dental services at various places before. However, parental behavior was not related to children's oral health (see Table 14 for details).

Table 14: Parental behavior associated with take care oral and teeth for their children with thalasemia

Variable	Status of teeth		OR	95%CI		P-value
	None decay	decay		Lower	upper	
	N(%)	N (%)				
Parental behavior in taking care oral and teeth for children						

Never	13 (7.3)	164(92.7)	1			
Done	9 (4.6)	189(95.4)	1.6	0.6	3.9	0.25
Parental behavior in taking their children to see dentist						
Never	16(9.1)	160(90.9)	1			
Ever	6(3.0)	193(97.0)	3.2	1.2	8.4	0.017*

Risk Factors for Dental Caries in Thalassemic Children (Aged 6-12 Years)

The study revealed that parental education level is a significant determinant of oral health; children whose parents attained an education level lower than secondary school were 10.2 times more likely to develop dental caries compared to those whose parents held a vocational certificate or higher. Furthermore, age played a critical role, with children in the 6-9 year age bracket being 3.6 times more susceptible to dental caries than those aged 10-12. Additionally, dental visit patterns showed a strong correlation: children whose parents had never taken them to a dentist faced a 5.8-fold increase in the likelihood of developing caries compared to those with a history of dental visits (refer to Table 15 for comprehensive data).

Table 14: Analysis of Risk Factors for Dental Caries in Thalassemic Children (Aged 6-12 Years)

Variables	Dental Status		COR (95% CI)	AOR (95% CI)	P-value
	None caries (%)	Caries n (%)			
Parental education level					
≥ vocational	10 (8.1)	113 (91.9)	1		
Secondary school	1 (1.3)	76 (98.7)	6.7 (0.8-53.6)	10.2 (1.2-85.6)	0.032
≤ primary school	11 (6.9)	164 (93.7)	1.3 (0.5-3.2)	2.4 (0.8-6.6)	0.081
Age					
10-12 years	10 (10.0)	27 (90.0)	1		
6-9 years	12 (4.3)	263 (95.6)	2.4 (1.0-5.8)	3.6 (1.3-9.8)	0.009
Family history of Thalassemia					
Never	20 (8.6)	212 (91.3)	1		
Ever	2 (1.4)	140 (98.6)	6.6 (1.5-28.6)	7.9 (1.7-35.5)	0.007
Taking children to see dentist					
Ever	16 (9.1)	160 (90.9)	1		
Never	6 (3.0)	193 (97.0)	3.2 (1.2-8.4)	5.8 (1.9-17.5)	0.001

Remark: * P-value <0.25 gof=0.49, AIC =309

Table 15 show that the risk factors associated with dental caries in child thalassemia between 6-12 years of age

Table 15: the risk factors associated with dental caries in child thalassemia

Variable	Dental status		AOR	95% CI		P-value
	None caries	Caries		Lower	Upper	
	N(%)	N (%)				
Age						

6 - 8 ̄	14 (5.9)	225 (94.1)	1			
9 - 12 ̄	35(25.8)	101(74.2)	0.12	0.05	0.25	<0.001*
Parental behavior take care teeth and oral health in children with thalasemia.						
Never	35 (15.1)	198 (84.9)	1			
Ever	14 (9.9)	128 (90.1)	2.66	1.28	5.52	<0.008*
Parental behavior in taking their children to dental check up in various services						
Ever	22 (11.1)	177 (88.9)	1			
Never	27 (15.4)	194 (84.6)	0.45	0.23	0.89	<0.023*

Discussion

The results of this study indicate a high prevalence of dental caries among children with anemia aged 6–12 years. These findings align with a study conducted at Srinagarind Hospital, Khon Kaen University, Thailand, which reported a prevalence of 88.5% in children with β -thalassemia and α -thalassemia (Weeraarchakul & Jetsrisuparb, 2010). However, the prevalence in this study was lower than that observed in the Republic of Azerbaïdjan, where the rate was 93.9% (R.V. & G.K., 2019), and in Syria, where 94% of children aged 6–12 years with thalassemia were affected by dental caries (Ibraheem, 2021). In this study, the 9–12 years age group showed a statistically significant correlation with caries prevention ($P < 0.05$).

This result is consistent with other research because, during this period, most primary teeth have been exfoliated or extracted, and permanent teeth have erupted in large numbers, typically leading to a lower incidence of caries in permanent teeth at that specific stage. These findings are supported by Major (2018), who found the 7–10 year age group to be statistically significant ($P < 0.05$), and Arora et al. (2014), who identified a significant Relationship within the 6–12 year age group ($P < 0.05$).

Furthermore, parental behavior regarding children's oral health—particularly oral hygiene through

toothbrushing—was found to be significantly associated with the occurrence of dental caries ($P = 0.008$). This is consistent with international studies, including research in Egypt. ($P < 0.0012$; Ibrahim et al., 2019), Cambodia ($P = 0.02$; Chu et al., 2008), Iran ($P = 0.05$; E. et al., 2013), Taiwan ($P = 0.001$; Liu et al., 2017), and India ($P = 0.001$; Thakur et al., 2017).

This study indicates that a significant number of parents prioritize taking their children for dental check-up. This practice shows a statistically significant association with the prevention of dental caries ($P = 0.023$), aligning with the findings of Rakhmilla (2017), who observed similar parental behavior regarding annual dental visits ($P < 0.05$). Comparable results were reported in Taiwan by Liu et al. (2017) and in India by Thakur et al. (2017) and Health (2011), all of whom identified a strong correlation between dental visits and caries prevention ($P = 0.001$).

Conclusion

The study reveals a high prevalence of dental caries among children with Thalassemia, recorded at 86.9% for permanent teeth and 92.8% for primary teeth. Among children aged 9–12 years, the combined prevalence for both types of teeth was 74.26%.

Statistical analysis showed a highly significant correlation between treatment duration (8–11 years) and the prevention of dental caries ($P < 0.001$). Furthermore,

parental involvement in maintaining children's oral hygiene varied significantly by the child's age ($P < 0.006$). Regarding oral health behaviors: 90.1% of children received direct guidance and assistance from parents. 84.9% of children practiced oral hygiene independently. The study found a significant Relationship between these behaviors and over all oral health out Comes ($P < 0.008$). Additionally, dental visit patterns showed that 88.9% of children had been taken to dental facilities, while 84.6% had not, with a statistically significant difference observed between these groups ($P < 0.023$).

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