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Assessment of Parental Awareness Regarding the Necessity of Space Maintainers in Cases of Early Primary Molar Loss: Cross-Sectional Study

Erken Süt Azı Diş Kaybı Durumlarında Yer Tutucu Gerekliliği Konusunda Ebeveynlerin Farkındalıklarının Değerlendirilmesi: Kesitsel Çalışma

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ABSTRACT Objective: This study aimed to evaluate parental awareness regarding the importance and necessity of space maintainers in cases of premature primary molar loss and to examine how this awareness correlates with children's actual oral health status, based on both questionnaire responses and clinical examination findings. **Material and Methods:** The study included 320 parents of children aged 4-9 years attending the Pediatric Dentistry Department at İnönü University. Data were collected using a 20-item validated questionnaire covering demographics, oral hygiene practices, and knowledge of space maintainers. Clinical oral examinations assessed the presence of caries, premature tooth loss, and use of space maintainers. Data were analyzed using chi-square and Fisher's exact tests ($p<0.05$). **Results:** Of the participants, 66.3% were mothers, and 43.8% had a high school education. Although 67.8% of parents valued primary teeth equally with permanent teeth, only 5.6% were aware of space maintainers. Clinical examinations showed that 85.2% of children had at least one decayed tooth, 36.5% had premature tooth loss; however, only 5.6% of children were using a space maintainer. Awareness of space maintainers was significantly higher among parents who valued primary teeth ($p=0.033$), and educational level significantly influenced regular dental visits ($p=0.019$). **Conclusion:** The findings emphasize a considerable gap in parental knowledge about space maintainers despite evident clinical need. This gap highlights the urgent need for targeted public health education programs and clinical counseling strategies to enhance preventive pediatric dental care. Addressing these deficiencies may contribute to improved oral health outcomes and reduced orthodontic complications in the long term.

Keywords: Primary teeth; space maintainers; parental awareness; pediatric dentistry; oral health

ÖZET Amaç: Bu çalışma, erken süt azı dişi kaybı durumlarında yer tutucuların önemi ve gerekliliğine ilişkin ebeveyn farkındalığını değerlendirmeyi ve bu farkındalığın, çocukların ağız sağlığı durumu ile hem anket yanıtlarına hem de klinik muayene bulgularına dayalı olarak nasıl ilişkili olduğunu incelemeyi amaçlamaktadır. **Gereç ve Yöntemler:** Çalışmaya, İnönü Üniversitesi Pedodonti Ana Bilim Dalına başvuran 4-9 yaş arası çocukların ebeveynlerinden toplam 320 kişi dâhil edilmiştir. Veriler; demografik bilgiler, ağız hijyeni uygulamaları ve yer tutucular hakkındaki bilgileri içeren 20 maddelik geçerliliği kanıtlanmış bir anket ile toplanmıştır. Ayrıca klinik ağız muayeneleri gerçekleştirilerek çürük varlığı, erken diş kaybı ve yer tutucu kullanımı değerlendirilmiştir. Veriler, ki-kare ve Fisher'ın kesin testleri ile analiz edilmiş, anlamlılık düzeyi $p<0,05$ olarak belirlenmiştir. **Bulgular:** Katılımcıların %66,3'ü annelerden oluşmakta olup, %43,8'i lise mezunudur. Ebeveynlerin %67,8'i süt dişlerini daimi dişler kadar önemli bulurken, yalnızca %5,6'sı yer tutucular hakkında bilgi sahibidir. Klinik muayeneler, çocukların %85,2'sinde en az bir çürük, %36,5'inde erken süt azı dişi kaybı olduğunu, ancak çocukların yalnızca %5,6'sının yer tutucu kullandığını göstermiştir. Yer tutucu farkındalığı, süt dişlerini önemli bulan ebeveynlerde anlamlı düzeyde daha yüksektir ($p=0,033$). Eğitim düzeyi ile düzenli diş hekimi ziyaretleri arasında da anlamlı ilişki bulunmuştur ($p=0,019$). **Sonuç:** Bulgular, belirgin klinik ihtiyaçlara rağmen ebeveyn bilgi düzeyinin düşük olduğunu ortaya koymaktadır. Bu boşluğun kapatılması için toplum temelli eğitim programlarına ve klinik danışmanlık stratejilerine ihtiyaç vardır. Bu tür müdahaleler, çocukların gelecekteki ağız sağlığı sonuçlarını iyileştirebilir.

Anahtar Kelimeler: Süt dişleri; yer tutucular; ebeveyn farkındalığı; çocuk diş hekimliği; ağız sağlığı

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Primary teeth play a central role not only in facilitating speech, chewing, aesthetic appearance, and the healthy development of oral functions but also in guiding the proper alignment and eruption of permanent teeth during children's growth and development.[1] In pediatric dentistry, preserving primary teeth is crucial due to their significant contribution to both oral health and general growth processes.[2]

The early loss of primary teeth often results from dental caries, trauma, periodontal diseases, or early root resorption. Children with a high incidence of dental caries and periodontal diseases are more susceptible to early tooth loss. Poor oral hygiene is a key behavioral risk factor for the early loss of primary teeth. Parents bear the responsibility for ensuring their children maintain proper oral hygiene and for supporting preventive care practices. Consequently, parental awareness of the importance of primary teeth and preventive oral care directly affects their children's oral health.[3]

Early tooth loss may lead to functional problems such as speech disorders and chewing difficulties in the short term, while in the long term, it can result in malocclusion and the misalignment of permanent teeth, causing complex orthodontic problems. Timely intervention in cases of early tooth loss is critical to prevent or mitigate these outcomes. Early detection of malocclusion can significantly reduce the complexity, duration, and cost of treatment. Accordingly, comprehensive management plans, including preventive and corrective strategies, must be established by dentists to address early loss of primary teeth. Space maintainers are preventive devices designed to prevent or reduce malocclusion issues during the primary or early mixed dentition periods.[4-6]

Recent studies have assessed both the effectiveness and clinical utilization patterns of space maintainers in pediatric dentistry. A systematic review reported that fixed space maintainers, such as band and loop appliances, offer superior long-term stability and lower failure rates compared to removable alternatives, including Hawley retainers. However, the effectiveness of removable appliances is largely influenced by patient compliance, as their success depends on consistent use and maintenance, with lower tolerance levels commonly observed among pediatric patients.[7] Additionally, recent innovations in digital manufacturing-particularly the use of 3D-printed space maintainers-have shown potential for improved patient comfort and clinical performance.[8]

In a retrospective study focusing on children aged 6 to 10 years, the prevalence of Nance space maintainer use was reported to be 76.5%. This finding underscores the widespread application of space maintainers during the mixed dentition period, particularly in cases requiring preservation of arch integrity.[9]

Despite their clinical benefits, significant gaps remain in the understanding and application of space maintainers. A cross-sectional study found that although 93.7% of participants acknowledged the necessity of space maintainers following premature loss of primary teeth, only 53.2% were aware of the factors influencing dental arch development. This discrepancy indicates that even among dental professionals, substantial knowledge deficiencies persist regarding the appropriate indications and clinical use of space maintainers.[2]

The statement "The best space maintainer is a primary tooth" is frequently emphasized in the literature, underscoring the critical role of primary teeth in guiding permanent teeth into proper alignment and preserving the ideal dental arch configuration. However, many parents perceive primary teeth as temporary and fail to provide adequate care or invest in their children's oral health. Even in developed countries, most parents take their children to the dentist only when treatment is required, rather than for preventive care.[1,2] Considering the limited number of studies in Türkiye evaluating parental awareness of the importance of primary teeth and the effectiveness of space maintainers, it can be inferred that the situation is similar in Türkiye.

This study was designed to evaluate the awareness levels of parents in Malatya province regarding space maintainers.

MATERIAL AND METHODS

This study was designed as a cross-sectional survey to evaluate the awareness of parents regarding the ne-

cessity of space maintainers following early primary molar loss. It was conducted among children aged 4-9 years who were randomly selected from patients presenting to the Pediatric Dentistry Department of İnönü University Faculty of Dentistry.

The sample size was determined in consultation with a statistician, and an a priori statistical power analysis was performed using G*Power software. Based on effect sizes reported in similar studies, a minimum of 300 participants was calculated (95% confidence interval, 80% power), and accounting for potential data loss, 320 parents were ultimately included. A simple random sampling method was employed to ensure balanced representation across age, gender, and socioeconomic status.

Inclusion criteria required children to be between 4-9 years, cooperative, and to have all primary teeth fully erupted. Written informed consent was obtained from parents. Clinical oral examinations were conducted by two experienced pediatric dentists (with at least 5 years of practice) using dental mirrors and explorers under appropriate illumination. Examinations included assessments of dental caries, missing teeth, filled teeth, and premature loss of primary molars, following the diagnostic criteria set by the World Health Organization. The presence or absence of space maintainers was also documented. These clinical findings were integrated with the questionnaire data to gain a comprehensive understanding of the children's oral health status and its association with parental awareness.

The survey instrument was specifically developed based on a detailed literature review and input from an expert panel. A pilot study with 30 parents was conducted to evaluate clarity and feasibility, and minor revisions were made accordingly. The final questionnaire comprised 20 items divided into three sections: 1) demographic data (age, gender, education level, income); 2) oral health knowledge, including attitudes toward primary teeth and dental visit habits; and 3) awareness and experience regarding space maintainers, covering indications, maintenance, dietary restrictions, and follow-up care.

To ensure validity, the questionnaire underwent expert review, and its internal consistency was confirmed by calculating Cronbach's alpha, which was found to be 0.82. Surveys were distributed and collected in person by the pediatric dentists, who also assisted parents in completing them when needed.

Data analysis was performed using IBM SPSS Statistics 25.0. Descriptive statistics (frequencies and percentages) were used to summarize categorical variables. Chi-square tests and Fisher's exact tests were applied to compare categorical variables between groups, with statistical significance set at $p<0.05$.

Ethical approval for the study was obtained from the Scientific Research and Publication Ethics Committee of İnönü University (date: December 3, 2024; no: 2024/6771). All procedures adhered to the principles outlined in the Declaration of Helsinki, ensuring the confidentiality and voluntary participation of all subjects.

RESULTS

DEMOGRAPHIC CHARACTERISTICS

Of the 320 participating parents, 66.3% were mothers and 33.7% were fathers. The majority of respondents were aged between 35-59 years (55.6%), followed by those aged 25-34 years (42.8%). Only 1.3% were between 18-25 years, and 0.3% were aged 60 or above. Regarding education level, 43.8% had completed high school, while 29.7% held a university degree or higher. Middle school and primary school graduates constituted 14% and 10% of the sample, respectively, and 2.5% of parents reported no formal education. In terms of family size, 46.3% of children had 1 sibling, 27.8% had 2, 20% had 3 or more, and 5.9% were only children (Table 1).

Parental Practices and Attitudes Regarding Oral Hygiene

As shown in Table 2, 67.8% of parents believed that primary teeth are as important as permanent teeth, whereas 26.3% considered them less important, and 5.9% did not regard them as important. In terms of dental visitation behavior, over half of the participants (52.2%) stated that they visit the dentist only when there is dental pain, while 26.2% reported attending check-ups every 6 months and 21.6% once a year.

TABLE 1: Demographic characteristics of participants

Variable	Category	n (%)
Parents	Mother	212 (66.3)
	Father	108 (33.7)
Age (years)	18-25	4 (1.3)
	25-34	137 (42.8)
	35-59	178 (55.6)
	60 and above	1 (0.3)
Education level	None	8 (2.5)
	Primary school	32 (10)
	Middle school	45 (14)
	High school	140 (43.8)
	University and above	95 (29.7)
Number of siblings	One sibling	148 (46.3)
	Two siblings	89 (27.8)
	Three or more siblings	64 (20)
	No siblings	19 (5.9)

Percentages (%) indicate distribution within each subgroup.

When asked about their involvement in their children's brushing routines, responses were nearly equally distributed: 34.1% reported brushing together with their children, another 34.1% supervised brushing, and 31.8% stated that their children brushed independently. These findings indicate that while a majority of parents recognize the importance of primary teeth, preventive dental behaviors such as regular check-ups remain limited.

Clinical Oral Examination Results

Examination of children's oral health revealed that 85.2% had at least one decayed tooth, and 65.7% had at least one filled tooth. Premature loss of primary molars was identified in 36.5% of children. Despite this clinical need, only 5.6% of children had a space maintainer in place, underscoring a significant gap between dental necessity and intervention.

Awareness of Space Maintainers

Parental knowledge and experience regarding space maintainers were generally limited (Table 3). Only 5.6% of parents reported prior experience with space maintainers, while 78.8% stated they had no such experience, and 15.6% were unsure. Similarly, 78.8% of participants did not know when a space maintainer should be used, and only 21.2% responded correctly.

TABLE 2: Parental practices and attitudes regarding oral hygiene

Survey item	Response option	n (%)
Are primary teeth as important as permanent teeth?	Yes	217 (67.8)
	No	19 (5.9)
	Less important	84 (26.3)
Frequency of dental visits	Every 6 months	84 (26.2)
	Once a year	69 (21.6)
	When there is dental pain	167 (52.2)
Do you accompany your child while brushing?	Observing	109 (34.1)
	Brushing together	109 (34.1)
	Child brushes alone	102 (31.8)

Percentages (%) indicate distribution within each subgroup.

TABLE 3: Parental knowledge levels regarding space maintainers

Variable	Category	n (%)
History of space maintainer usage	Yes	18 (5.6)
	No	252 (78.8)
	I don't know	50 (15.6)
Knowledge of when to use a space maintainer	Yes	68 (21.2)
	No	252 (78.8)
Knowledge about food restrictions during space maintainer usage	Yes	28 (8.8)
	No	292 (91.2)
Importance of oral hygiene during space maintainer usage	Yes	117 (36.5)
	No	12 (3.8)
	I don't know	191 (59.7)
Knowledge of frequency of space maintainer check-ups	Yes	158 (49.4)
	No	32 (10.0)
	I don't know	130 (40.6)
Knowledge of when to	Yes	29 (9.1)
	No	291 (90.9)

Percentages (%) indicate distribution within each subgroup.

Knowledge about specific care practices related to space maintainers was also found to be low. Only 8.8% of parents were aware of dietary restrictions associated with their use, and 9.1% knew the appropriate timing for removal. While 36.5% of participants acknowledged the importance of maintaining oral hygiene during space maintainer use, the majority (59.7%) were unaware, and 3.8% reported it was not important. Regarding follow-up visits, 49.4% of parents knew the recommended frequency for check-ups, 10.0% responded incorrectly, and 40.6% were unsure.

Gender-Based and Brushing Behavior Comparisons

As shown in Table 4, no statistically significant differences were found between mothers and fathers re-

TABLE 4: Comparison of parental awareness of space maintainers and attitudes towards oral hygiene

Variable	Mother n (%)	Father n (%)	Total n (%)	p value
Are primary teeth as important as permanent teeth?				
Yes	145 (66.8)	72 (33.2)	217	
No	10 (52.6)	9 (47.4)	19	**0.426**
Less important	57 (67.9)	27 (32.1)	84	
Frequency of dental visits				
Every 6 months	56 (66.7)	28 (33.3)	84	
Once a year	48 (69.6)	21 (30.4)	69	**0.766**
When there is dental pain	108 (64.7)	59 (35.3)	167	
Accompanying while brushing				
Observing	79 (72.5)	30 (27.5)	109	
Brushing together	67 (61.5)	42 (38.5)	109	**0.211**
Child brushes alone	66 (64.7)	36 (35.3)	102	
Knowledge about food restrictions during space maintainer usage				
Yes	19 (67.9)	9 (32.1)	28	**0.851**
No	193 (66.1)	99 (33.9)	292	

Percentages (%) indicate distribution within each subgroup; p value denotes statistical significance based on chi-square test.

garding their awareness of space maintainers or general oral hygiene behaviors (p>0.05). For instance, 66.8% of mothers and 33.2% of fathers agreed that primary teeth are as important as permanent teeth. Among parents who reported regular dental visits every 6 months, 66.7% were mothers and 33.3% were fathers.

Brushing behavior showed that 72.5% of those who observed their children brushing were mothers, compared to 27.5% fathers. Similarly, 61.5% of those who brushed together with their children were mothers, and 38.5% were fathers. The overall comparison of brushing behaviors between mothers and fathers did not reach statistical significance (p=0.211); however, mothers tended to supervise or brush with their children more frequently.

Awareness of dietary restrictions during space maintainer use was also similar between genders (p=0.851), with 67.9% of those aware being mothers and 32.1% fathers. Overall, gender did not significantly influence awareness or attitudes related to pediatric oral hygiene or space maintainer usage.

Influence of Parental Education Level

Parental education level had a statistically significant impact on oral health attitudes and behaviors. Regarding the question "Are primary teeth as important as permanent teeth?", responses varied significantly by education level (p<0.001). Among those who answered "yes," 40.1% were high school graduates, and 36.4% held university degrees. In contrast, among parents who answered "no," the majority were middle school graduates (36.8%), followed by equal proportions from university graduates and those with no formal education (15.8% each). This indicates that lower educational attainment was more frequently associated with underestimating the importance of primary teeth.

A similar pattern was observed in dental visit frequency (p=0.019). Among parents who reported attending regular 6-month checkups, 39.3% had university degrees and 33.3% were high school graduates. Conversely, 49.1% of those who only visited the dentist in cases of dental pain were high school graduates, while 22.2% were university graduates. This suggests that higher education is positively associated with preventive dental behaviors.

Parental involvement in children's brushing routines also differed significantly across education levels (p=0.039). Of those who brushed together with their children, 43.1% were high school graduates and 34% had university degrees. Parents with lower educational levels (none or primary) were less likely to engage in brushing together. Additionally, among those who allowed their children to brush alone, a sizable proportion were high school (34.3%) and university (29.4%) educated, but there was still a notable presence of those with no formal education (3.9%). These findings highlight that higher parental education is associated with more active involvement in promoting children's oral hygiene.

Detailed data on the relationship between parental education level and oral health-related attitudes and behaviors are provided in Table 5. For instance, higher rates of university graduates acknowledged the importance of primary teeth compared to parents with lower education levels. Likewise, regular dental check-ups every 6 months were more common among parents with higher education, while lower education was associated with visiting the dentist only in case of pain. Brushing practices

TABLE 5: Distribution of responses and statistical significance based on parental education levels

Variable	None n (%)	Primary school n (%)	Middle school n (%)	High school n (%)	University and above n (%)	Total n (%)	p value
Are primary teeth as important as permanent teeth?							
Yes	2 (0.9)	18 (8.3)	31 (14.3)	87 (40.1)	79 (36.4)	217	
No	3 (15.8)	2 (10.5)	7 (36.8)	4 (21.1)	3 (15.8)	19	**0.000**
Less important	3 (3.6)	12 (14.3)	7 (8.3)	49 (58.3)	13 (15.5)	84	
Frequency of dental visits							
Every 6 months	0 (0)	10 (11.9)	13 (15.5)	28 (33.3)	33 (39.3)	84	
Once a year	0 (0)	5 (7.3)	9 (13)	30 (43.5)	25 (36.2)	69	**0.019**
When there is dental pain	8 (4.8)	17 (10.1)	23 (13.8)	82 (49.1)	37 (22.2)	167	
Accompanying while brushing							
Observing	4 (3.7)	9 (8.2)	10 (9.2)	58 (53.2)	28 (25.7)	109	
Brushing together	0 (0)	11 (10.1)	14 (12.8)	47 (43.1)	37 (34)	109	**0.039**
Child brushes alone	4 (3.9)	12 (11.8)	21 (20.6)	35 (34.3)	30 (29.4)	102	

Percentages (%) indicate distribution within each subgroup; p value denotes statistical significance based on chi-square test.

also differed significantly by education level, with parents having higher education more likely to brush together with their children (Table 5).

Relationship Between Awareness of Primary Teeth and Other Variables

As presented in Table 6, a strong relationship was observed between parents' recognition of the importance of primary teeth and their oral health-related behaviors. Among those who took their children for routine dental check-ups every 6 months, 83.3% agreed that primary teeth are as important as permanent teeth. This rate was even higher (89.9%) among parents who scheduled annual visits. In contrast, only 50.9% of parents who visited the dentist solely in cases of pain shared the same view.

Brushing behaviors also demonstrated significant differences. Of those who brushed together with their children, 83.5% emphasized the importance of primary teeth, compared to 62.8% of parents who allowed their children to brush independently. This difference was statistically significant ($p<0.001$). Similarly, among parents who correctly answered when space maintainers should be used, 80.9% acknowledged the importance of primary teeth, compared to 64.3% of those who did not ($p=0.033$).

TABLE 6: Comparison of responses to the question "Are primary teeth as important as permanent teeth?" with other variables

Variable	Yes n (%)	No n (%)	Less Important n (%)	Total n (%)	p value
Frequency of dental visits					
Every 6 months	70 (83.3)	5 (6.0)	9 (10.7)	84	
Once a year	62 (89.9)	0 (0.0)	7 (10.1)	69	**0.000**
When there is dental pain	85 (50.9)	14 (8.4)	68 (40.7)	167	
Accompanying while brushing					
Observing	62 (56.9)	5 (4.6)	42 (38.5)	109	
Brushing together	91 (83.5)	1 (0.9)	17 (15.6)	109	**0.000**
Child brushes alone	64 (62.8)	13 (12.7)	25 (24.5)	102	
Knowledge of when to use space maintainers					
Yes	55 (80.9)	2 (2.9)	11 (16.2)	68	**0.033**
No	162 (64.3)	17 (6.7)	73 (29.0)	252	

Percentages (%) indicate distribution within each subgroup; p value denotes statistical significance based on chi-square test.

These findings suggest that greater parental awareness of the value of primary teeth is associated with more proactive oral hygiene habits and a better understanding of preventive pediatric dental care.

DISCUSSION

Parents play a pivotal role in managing their children's oral and dental health. Preserving primary teeth is of significant importance not only for aesthetic and functional purposes but also to ensure the proper alignment of permanent teeth and maintain the dental arch.[1,10] Additionally, the use of space maintainers is a key preventive strategy in pediatric dentistry, aiming to mitigate the adverse effects of early primary tooth loss and prevent future complications.[11,12] However, existing literature highlights that parental awareness regarding space maintainers is generally low.[1,3,13] For example, a recent cross-sectional survey in Türkiye reported that only 35.8% of parents were aware of what a space maintainer is, reflecting a substantial knowledge gap among caregivers.[14]

The findings of this study underscore a significant gap in parental awareness regarding the use of space maintainers, despite a general recognition of the importance of primary teeth. Moreover, this lack of awareness aligns with observations from various regions, where studies have highlighted insufficient parental knowledge about the role of space maintainers in preventing malocclusion and guiding the proper eruption of permanent teeth.[1,3,15-17] Such deficiencies may arise not only from a lack of direct education provided by dental professionals but also from broader systemic factors, including limited access to pediatric dental care and cultural tendencies to undervalue primary teeth. In Türkiye, for instance, the virtual absence of coordinated public oral health promotion programs for children has been noted to result in many carious lesions remaining untreated until they cause pain.[18] This indicates that these systemic factors may further exacerbate the problem.

The absence of governmental support in disseminating information on space maintainers and other preventive care strategies likely contributes to this gap by failing to provide structured education and accessible guidance to families. In addition, variations in reported awareness rates across studies could stem from methodological differences, such as disparities in sample size, urban versus rural populations, and whether data were collected via interviews or self-administered surveys. Addressing this multifaceted issue therefore requires targeted educational initiatives aimed at informing parents about the significance of early intervention and the preventive benefits of space maintainers in pediatric oral health.

Parental education level emerged as a significant determinant of oral health attitudes and behaviors in this study. Specifically, higher educational attainment was associated with greater awareness of the importance of primary teeth, more consistent engagement in preventive behaviors such as regular dental check-ups, and more active involvement in children's brushing routines. These findings are consistent with previous research, which has repeatedly demonstrated a positive correlation between parental education and oral health practices.[10,19,20] Notably, a large-scale survey conducted by Chen et al., involving over 8,000 families, further supports this association, showing that parents with higher education levels possess greater oral health knowledge and that their children are more likely to adopt favorable hygiene behaviors. Moreover, the study reported increased demand for preventive interventions, such as fissure sealants, among better-educated parents.[21] Moreover, this trend holds true in Türkiye as well: a recent study found that mothers with lower education were significantly more likely to believe that treating primary teeth is not necessary.[22] Such evidence underscores the importance of tailoring oral health education strategies to account for educational disparities, ensuring equitable access to information and care for all socioeconomic groups.

The lack of awareness regarding space maintainers can have long-term negative consequences for children's oral and dental health. Early use of space maintainers is crucial in preventing malocclusion, dental crowding, and functional disorders.[5,6] Despite their clinical significance, this study, in line with prior literature, revealed that many parents lack essential knowledge about the indications and care protocols associated with these appliances.[23,24] This gap in prac-

tical understanding-particularly regarding dietary considerations and follow-up requirements-highlights the importance of implementing targeted educational strategies to equip parents with the necessary skills and information for effectively supporting their children's oral health needs.

The clinical oral examination conducted in this study further corroborated the survey findings, revealing that while the majority of children had untreated dental decay or premature tooth loss, the application of space maintainers was extremely limited. This discrepancy between clinical need and actual intervention represents a missed opportunity in preventive pediatric care. In one Turkish hospital-based study, dental caries was identified as by far the most common reason for primary tooth extractions (accounting for over 57% of cases) yet the utilization of space maintainers in such cases remains exceedingly low.[25] Therefore, incorporating parental education at the point of care-especially when premature extractions are necessary-could help close this gap and promote more timely intervention with space maintenance when indicated.

Limited engagement in routine dental visits reflects a broader issue of insufficient adoption of preventive oral health practices among caregivers. Numerous studies have highlighted that in populations with lower levels of oral health awareness, dental appointments are often scheduled reactively-typically in response to pain-rather than proactively for preventive care purposes.[26-28] Indeed, it has been observed that many children do not receive dental treatment until problems become acute, resulting in higher rates of emergency visits and extractions.[25] This reactive approach not only delays necessary early interventions but also increases the risk of progression of dental diseases. Clinically, these observations underscore the importance of integrating oral health education into school and community settings to reach parents before dental issues become symptomatic. Consequently, enhancing public awareness and promoting preventive strategies-such as routine check-ups and early professional evaluations-remain essential components of community-level oral health promotion initiatives.

The importance of space maintainers is frequently emphasized in the literature, often encapsulated in the phrase "The best space maintainer is the primary tooth".[1,10] Despite this, many parents perceive primary teeth as temporary and fail to prioritize their children's oral health. This study highlights the existing gaps in parental knowledge about space maintainers, reinforcing the need for public education. For instance, Sajadi et al., demonstrated that educational interventions significantly improved parental awareness and attitudes toward space maintainers.[11] Similar programs implemented across Türkiye could result in substantial improvements in children's oral health management.

LIMITATIONS

This study has several limitations. The cross-sectional design prevents establishing causal relationships between variables. Additionally, the reliance on self-reported data introduces the potential for social desirability bias, which may have influenced the results. Furthermore, the study was conducted at a single institution, which may limit the generalizability of the findings to the broader population. Future longitudinal studies and intervention-based research are recommended to further explore the impact of educational strategies on parental awareness. Despite these limitations, the study possesses several strengths. It includes a relatively large and demographically diverse sample size, which enhances generalizability within the study population. Additionally, the use of a validated questionnaire and the inclusion of clinical oral examination data provide both subjective and objective insights into parental awareness and pediatric oral health conditions.

CONCLUSION

This study highlights a critical gap in parental awareness regarding the importance of primary teeth and the use of space maintainers. Clinical oral examinations confirmed a high prevalence of untreated dental caries and premature tooth loss among children, yet the use of space maintainers remained exceptionally low-revealing a disconnect between clinical need and parental knowledge or action.

To address this issue, comprehensive strategies are needed. These should include school-based oral health education, parental counseling during pediatric dental visits, and collaboration with public health institutions to disseminate accurate and accessible information through community programs, media campaigns, and digital platforms. Equipping parents with the knowledge and tools to act preventively can promote early and appropriate dental care and ultimately improve long-term oral health outcomes in children.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

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