



Parental Knowledge and Awareness Regarding Children's Teething

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Research Article

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ABSTRACT

Objectives: This study aimed to evaluate parents' knowledge, beliefs and practices concerning teething in children aged 0–4 years, and to determine how these are influenced by sociodemographic factors.

Materials and Methods: A cross-sectional study was conducted with 416 parents attending a paediatric dentistry clinic. Data were obtained via a 17-item structured questionnaire assessing demographic characteristics, perceived teething symptoms, management strategies, information sources and overall knowledge. Statistical analyses included Pearson's chi-square test, Fisher's exact test, Yates' continuity correction and Bonferroni-adjusted z-tests ($p < 0.05$).

Results: The most frequently reported symptoms were biting (95.0%), gingival itching (92.3%), irritability (90.1%), drooling (81.0%) and loss of appetite (80.5%). Mothers reported fever ($p = 0.003$) and appetite loss ($p = 0.004$) more frequently, whereas fathers more commonly observed biting behaviour ($p = 0.025$). The most frequently used management strategies were teething rings (78.4%), gingival massage with firm fruits or vegetables (59.9%) and teething gels (38.0%). Higher educational status was significantly associated with the use of cold applications ($p = 0.003$) and evidence-based information sources ($p = 0.001$).

Conclusions: Parental knowledge of teething was generally adequate; however, persistent misconceptions—particularly the attribution of systemic symptoms to teething and the use of unnecessary or potentially harmful interventions—were identified. Education level and gender emerged as the primary factors influencing symptom perception and management choices.

Brief, evidence-based guidance delivered during routine paediatric or dental appointments may support safer symptom management, reduce inappropriate practices and facilitate earlier recognition of systemic conditions.

Keywords: Child, parents, perception, signs and symptoms, teething, tooth eruption

Çocukları Dişlenme Döneminde Olan Ebeveynlerin Bilgi ve Farkındalık Düzeylerinin İncelenmesi

Araştırma Makalesi

Süreç

Geliş: 22/10/2025

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ÖZ

Amaç: Bu çalışmanın amacı, 0–4 yaş arası çocuğu olan ebeveynlerin diş çıkarma sürecine ilişkin bilgi, inanç ve uygulamalarını değerlendirmek ve sosyodemografik faktörlerin bu durum üzerindeki etkisini incelemektir.

Gereç ve Yöntemler: Kesitsel nitelikteki bu çalışmaya çocuk diş hekimliği kliniğine başvuran 416 ebeveyn katılmıştır. Veriler; demografik bilgiler, algılanan diş çıkarma belirtileri, kullanılan yöntemler, bilgi kaynakları ve genel bilgi düzeyini içeren 17 soruluk yapılandırılmış bir anketle toplanmıştır. Veriler Pearson Ki-kare, Fisher's exact, Yates düzeltmesi ve Bonferroni düzeltmeli z-testleri ile analiz edilmiştir ($p < 0,05$).

Bulgular: En sık bildirilen belirtiler; ısırma isteği (%95,0), diş eti kaşıntısı (%92,3), huzursuzluk (%90,1), salya akışı (%81,0) ve iştahsızlık (%80,5) olmuştur. Anneler ateş ($p = 0,003$) ve iştahsızlık ($p = 0,004$) belirtilerini daha sık bildirirken, babalar ısırma davranışını daha sık gözlemlemiştir ($p = 0,025$). En yaygın kullanılan yönetim yöntemleri; diş kaşıma halkaları (%78,4), sert meyve veya sebzelerle diş eti masajı (%59,9) ve diş çıkarma jelleri (%38,0) olarak belirlenmiştir. Yüksek eğitim düzeyi, soğuk uygulama kullanımında ($p = 0,003$) ve kanıta dayalı bilgi kaynaklarını tercih etmede ($p = 0,001$) anlamlı şekilde etkili bulunmuştur.

Sonuçlar: Ebeveynlerin diş çıkarma sürecine ilişkin bilgi düzeyi genel olarak yeterli olsa da, özellikle sistemik belirtilerin yalnızca diş çıkarma ile ilişkilendirilmesi ve gereksiz uygulamaların devam etmesi dikkat çekicidir. Eğitim düzeyi ve cinsiyet semptomların yorumlanması ve kullanılan yöntemler üzerinde belirleyici olmuştur. Rutin pediatri ve diş hekimliği kontrollerine kısa ve kanıta dayalı ebeveyn bilgilendirmelerinin eklenmesi, riskli uygulamaların önlenmesine ve olası sistemik hastalıkların erken fark edilmesine katkı sağlayabilir.

Anahtar Sözcükler: Algi, belirti ve bulgular, çocuk, diş çıkarma, ebeveyn

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Introduction

Teething is a physiological process whereby a tooth migrates from its bony crypt within the alveolar bone into the oral cavity and eventually reaches functional occlusion with its antagonist.¹ Primary teeth typically begin to erupt around

six months of age and are usually completed by approximately three years, a period commonly referred to as the primary dentition stage.²

Parents frequently associate teething with a variety of signs and symptoms such as irritability, crying, sleep disturbances, agitation, fever, rhinorrhoea, facial flushing, excessive drooling, gingival inflammation, diarrhoea and loss of appetite.³⁻⁵ However, current evidence suggests that these clinical findings are not directly caused by teething. For example, the maturation of the salivary glands around 2–3 months of age physiologically increases salivary flow, which is often mistakenly attributed to teething.^{6,7}

In an attempt to alleviate teething-related discomfort in their children, many parents resort to a range of pharmacological and non-pharmacological methods, often without consulting a dentist or physician.⁸ Some of these practices are based on traditional beliefs or folklore and may pose health risks—for instance, causing gingival swelling, ulceration due to cauterisation, or intentional trauma to the gingiva in an attempt to accelerate tooth eruption.⁹ Moreover, various culturally accepted yet potentially hazardous practices are reported in the literature, including amber necklaces that increase choking risk,¹⁰ the use of substances such as opium derivatives, lead acetate, mercury and bromide to reduce fever,⁹ or bathing the child in cold water.¹¹ Teething gels containing benzocaine or choline salicylate are also commonly used, although these agents may lead to serious complications such as methaemoglobinaemia, aspiration or toxicity.¹²

Cultural and sociodemographic factors significantly shape parental responses to childhood illness, utilisation of dental services and the likelihood of seeking professional care. In particular, limited access to education among women—often linked to lower socioeconomic status and early pregnancy—has been shown to negatively affect child health outcomes.¹³ Previous research has indicated that parents often have inadequate knowledge, inappropriate attitudes and suboptimal practices regarding teething.^{8,14-17}

Although various studies have examined parents' knowledge, beliefs and practices regarding teething, comprehensive and up-to-date data from socio-culturally diverse regions of Türkiye—particularly the eastern provinces—remain limited. In addition, most studies conducted in Türkiye have focused predominantly on mothers, while fathers' perspectives have frequently been overlooked, making it difficult to evaluate parental approaches within the broader family context.^{13,18-20} The considerable variation in parental beliefs and practices across different regions further highlights the clinical and public health relevance of this topic, as misconceptions may expose children to preventable health risks such as trauma, toxic substance exposure, airway obstruction and delayed professional care. Therefore, assessing parents' knowledge, attitudes and practices is essential for enabling clinicians to provide evidence-based guidance, identify harmful behaviours early and strengthen preventive oral health services. Furthermore, understanding regional differences and the influence of sociodemographic factors offers an important foundation for developing community-based educational initiatives, creating evidence-based awareness materials for parents and informing national oral health policies. The aim of the present study is to evaluate the

knowledge, attitudes and practices of parents living in the Eastern Anatolia Region of Türkiye regarding teething and to examine their association with sociodemographic variables such as education level, gender, age and income.

The null hypothesis of the study states that there is no statistically significant difference between parents' sociodemographic characteristics and their knowledge, attitudes and practices concerning their children's teething.

Materials and Methods

Study Design

This research was designed as a cross-sectional study. Ethical approval was obtained from the

Non-Interventional Clinical Research Ethics Committee of Van Yüzüncü Yıl University (Decision No: 2025/05-02). The study was conducted in accordance with the principles of the Declaration of Helsinki and adhered to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines.²¹ The questionnaire included an informed consent statement explaining the purpose of the study and voluntary participation. Data were collected from parents of children aged 0–4 years who attended the paediatric dentistry clinic and agreed to participate voluntarily between June and August 2025. Written informed consent was obtained from the parents of all participants.

Sampling Criteria

A pilot study was conducted by the authors with 51 parents to obtain the effect size required for the sample size estimation. In this preliminary study, contingency tables were constructed for key categorical variables, and Cohen's w was calculated based on the discrepancy between observed and expected frequencies ($\chi^2 = 3.139$, $p = 0.548$). The largest effect size derived from the pilot data ($w = 0.232$) was then entered into G*Power v3.1.9.7 using a 95% confidence level ($1-\alpha$) and 95% test power ($1-\beta$). According to this power analysis, a minimum of 346 participants was required. Considering a potential 20% non-response or dropout rate, the final minimum sample size for the present study was determined to be 433.

Inclusion criteria were: parents of children aged 0–4 years, voluntary participation, provision of informed consent and completion of the questionnaire in full. Exclusion criteria included: parents of children older than 4 years, refusal to participate and incomplete or incorrectly filled questionnaires.

Questionnaire

Data were collected using a structured 17-item questionnaire developed by the researchers based on previous studies in the literature.^{18,19,22} To ensure content validity, the initial version of the questionnaire was reviewed by two experts in paediatric dentistry, who evaluated all items for clarity, relevance and appropriateness. Before data collection, the questionnaire was piloted with 30 parents to assess clarity, comprehensibility and cultural relevance. Minor wording adjustments were made based on the feedback obtained. The internal consistency of the final

version of the questionnaire was good, with a Cronbach's alpha value of 0.84.

The questionnaire was administered through face-to-face interviews and consisted of four main sections: (1) sociodemographic characteristics, (2) perceived teething symptoms, (3) management methods used during teething and sources of information, and (4) parental knowledge regarding primary dentition.

Monthly household income was classified using a combined approach based on the official net minimum wage for 2025 and national income distribution data.^{23,24} The net monthly minimum wage announced by the Ministry of Labor and Social Security for 2025 was 22,104.67 TL. Accordingly, income categories were defined as follows: low income (<33,200 TL; i.e., less than 1.5 times the minimum wage), middle income (33,200–66,300 TL; i.e., 1.5–3 times the minimum wage), and high income (>66,300 TL; more than 3 times the minimum wage).

Incomplete questionnaires, as well as forms in which more than one option was selected for single-answer items, were excluded prior to statistical analysis. Only fully completed questionnaires were included in the final dataset.

Statistical Analysis

Data were analysed using the R software (version 4.4.1). Descriptive statistics (frequency and percentage distributions) were calculated for sociodemographic variables. Relationships between categorical variables were evaluated using Pearson's chi-square test, Yates' continuity

correction and Fisher's exact test (with Monte Carlo simulation when required). Pairwise comparisons were performed using Bonferroni-adjusted z-tests. A *p*-value of <0.05 was considered statistically significant for all analyses.

Results

A total of 435 parents agreed to participate in the study. However, four questionnaires were excluded due to incomplete responses, and 15 were omitted because more than one option was selected for single-answer questions. Consequently, a total of 19 questionnaires were excluded, and the final sample consisted of 416 valid and fully completed forms included in the statistical analysis.

Sociodemographic Characteristics

Of the 416 parents included in the study, 83.4% were mothers (*n* = 347) and 16.6% were fathers (*n* = 69). The majority of participants were aged 30–39 years (54.6%, *n* = 227). Regarding educational status, 57.2% (*n* = 238) were university graduates, 19.0% (*n* = 79) held a postgraduate degree, while 1.7% (*n* = 7) had no formal education. When the number of children per family was evaluated, 46.7% (*n* = 198) had one child, 37.3% (*n* = 155) had two children and 15.1% (*n* = 63) had three or more children. Regarding household income, six participants (1.4%) did not report their income. Among those who responded, 4.3% (*n* = 18) were in the low-income group, 19.7% (*n* = 82) were in the middle-income group and 74.5% (*n* = 310) were classified as high-income (Table 1).

Table 1. Descriptive characteristics of the participants

Characteristic		n	%
Sex	Female	347	83.4
	Male	69	16.6
Age group (years)	20–29	76	18.3
	30–39	227	54.6
	40–49	113	27.2
Education level	No formal education	7	1.7
	Primary/secondary school	29	7.0
	High school	63	15.1
	University	238	57.2
	Postgraduate	79	19.0
Number of children	1 child	198	46.7
	2 children	155	37.3
	3 or more children	63	15.1
Household income	Not declared	6	1.4
	Low income (<33,200 TL/month)	18	4.3
	Middle income (33,200–66,300 TL/month)	82	19.7
	High income (>66,300 TL/month)	310	74.5
	Total	416	100.0

Teething Symptoms

The most frequently reported symptom was the desire to bite objects (95.0%), followed by gingival itching (92.3%), irritability (90.1%), drooling (81.0%) and loss of appetite (80.5%). Less frequently reported symptoms included fever (74.8%), gingival redness (75.0%), finger sucking (66.1%), reduced interest in solid foods (55.3%) and diarrhoea (48.1%). The least commonly reported findings were vomiting (11.5%), susceptibility to other illnesses (20.7%) and rhinorrhoea (26.2%). An analysis of symptom reporting by

gender revealed that mothers were significantly more likely than fathers to report fever (*p* = 0.003) and appetite loss (*p* = 0.004), fathers more frequently reported the desire to bite objects (*p* = 0.025) (Table 2). When assessed by age groups, a statistically significant difference was found only for the variable "increased susceptibility to other illnesses" (*p* = 0.026). Parents aged 30–39 years reported this symptom more frequently, while those aged 20–29 years more often selected the response "I don't know." Regarding education level, significant differences were detected for diarrhoea (*p* =

0.008), vomiting ($p = 0.010$) and gingival itching ($p = 0.027$). Diarrhoea ($p = 0.008$) and vomiting ($p = 0.010$) were more commonly reported by parents with university or postgraduate education, whereas gingival itching was more

prominent among participants with high school and university education levels ($p = 0.027$). No statistically significant association was found between income level and teething symptoms ($p > 0.05$).

Table 2. Comparison of teething-related symptoms by sex

Symptom	Female n (%)	Male n (%)	Total	p-value
Fever				
Yes	249 (71.8) ^a	62 (89.9) ^b	311 (74.8)	0.003 ^x
No	93 (26.8) ^a	6 (8.7) ^b	99 (23.8)	
I don't know	5 (1.4)	1 (1.5)	6 (1.4)	
Diarrhoea				
Yes	167 (48.1)	33 (47.8)	200 (48.1)	0.073 ^x
No	161 (46.4)	27 (39.1)	188 (45.2)	
I don't know	19 (5.5)	9 (13.0)	28 (6.7)	
Loss of appetite				
Yes	286 (82.4) ^a	49 (71.0) ^b	335 (80.5)	0.004 ^x
No	54 (15.6)	13 (18.8)	67 (16.1)	
I don't know	7 (2.0) ^a	7 (10.1) ^b	14 (3.4)	
Gingival redness				
Yes	263 (75.8)	49 (71.0)	312 (75.0)	0.080 ^x
No	65 (18.7)	11 (15.9)	76 (18.3)	
I don't know	19 (5.5)	9 (13.0)	28 (6.7)	
Desire to bite objects				
Yes	333 (96.0) ^a	62 (89.9) ^b	395 (95.0)	0.025 ^x
No	7 (2.0) ^a	6 (8.7) ^b	13 (3.1)	
I don't know	7 (2.0)	1 (1.5)	8 (1.9)	
Increased salivation				
Yes	282 (81.3)	55 (79.7)	337 (81.0)	0.645 ^x
No	56 (16.1)	11 (15.9)	67 (16.1)	
I don't know	9 (2.6)	3 (4.4)	12 (2.9)	
Rhinorrhoea				
Yes	94 (27.1)	15 (21.7)	109 (26.2)	0.589 ^x
No	207 (59.7)	46 (66.7)	253 (60.8)	
I don't know	46 (13.3)	8 (11.6)	54 (13.0)	
Respiratory problems				
Yes	105 (30.3)	17 (24.6)	122 (29.3)	0.162 ^x
No	193 (55.6)	36 (52.2)	229 (55.1)	
I don't know	49 (14.1)	16 (23.2)	65 (15.6)	
Vomiting				
Yes	37 (10.7)	11 (15.9)	48 (11.5)	0.173 ^x
No	280 (80.7)	49 (71.0)	329 (79.1)	
I don't know	30 (8.6)	9 (13.0)	39 (9.4)	
Ear pain				
Yes	141 (40.6)	27 (39.1)	168 (40.4)	0.165 ^x
No	161 (46.4)	27 (39.1)	188 (45.2)	
I don't know	45 (13.0)	15 (21.7)	60 (14.4)	
Susceptibility to other illnesses				
Yes	69 (19.9)	17 (24.6)	86 (20.7)	0.675 ^x
No	191 (55.0)	36 (52.2)	227 (54.6)	
I don't know	87 (25.1)	16 (23.2)	103 (24.8)	
Reduced appetite for solid foods				
Yes	193 (55.6)	37 (53.6)	230 (55.3)	0.169 ^x
No	112 (32.3)	18 (26.1)	130 (31.3)	
I don't know	42 (12.1)	14 (20.3)	56 (13.5)	
Finger sucking				
Yes	221 (63.7)	54 (78.3)	275 (66.1)	0.051 ^x
No	113 (32.6)	13 (18.8)	126 (30.3)	
I don't know	13 (3.8)	2 (2.9)	15 (3.6)	
Gingival itching				
Yes	323 (93.1)	61 (88.4)	384 (92.3)	0.184 ^x
No	14 (4.0)	3 (4.4)	17 (4.1)	
I don't know	10 (2.9)	5 (7.2)	15 (3.6)	
Irritability				
Yes	312 (89.9)	63 (91.3)	375 (90.1)	1.000 ^x
No	19 (5.5)	3 (4.4)	22 (5.3)	
I don't know	16 (4.6)	3 (4.4)	19 (4.6)	
	249 (71.8) ^a	62 (89.9) ^b	311 (74.8)	

^x: Fisher's exact test with Monte Carlo correction; $p < 0.05$; ^{a-b}: Values with the same superscript letter indicate no significant difference between groups; n (%).

Management Methods Used During Teething

The methods used by parents to manage teething-related discomfort were also evaluated. The most frequently reported practices were the use of teething rings (78.4%), gum massage with firm fruits or vegetables (59.9%), teething gels (38.0%), analgesic medication (37.7%) and cold application (32.9%). In contrast, herbal products (17.8%) and amber necklaces (17.5%) were less commonly preferred, while the proportion of parents who reported using no method was notably low (5.0%). In terms of gender, mothers were more likely than fathers to use teething rings ($p = 0.035$) and gum massage with fruits or vegetables ($p = 0.006$) (Table 3). When evaluated by age group, significant differences were found in the use of

cold applications ($p = 0.016$) and amber necklaces ($p = 0.032$). Cold applications were most frequently reported by parents aged 30–39 years and least by those aged 40–49 years, while the use of amber necklaces was particularly common among parents aged 30–39 years. Regarding education level, significant differences were identified for cold application ($p = 0.003$) and not using any method ($p = 0.042$). The use of cold applications increased with higher education levels, whereas the proportion of parents who reported using no method was higher among those with lower education levels. No statistically significant association was found between income level and the methods used to manage teething symptoms ($p > 0.05$).

Table 3. Association between sex and methods used during the teething period

Method	Sex		Test Statistic	p-value
	Female n (%)	Male n (%)		
Teething gel				
No	216 (62.2)	42 (60.9)	0.046	0.829 ^x
Yes	131 (37.8)	27 (39.1)		
Analgesic				
No	213 (61.4)	46 (66.7)	0.684	0.408 ^x
Yes	134 (38.6)	23 (33.3)		
Cold application				
No	228 (65.7)	51 (73.9)	1.403	0.236 ^y
Yes	119 (34.3)	18 (26.1)		
Teething ring				
No	68 (19.6)	22 (31.9)	4.426	0.035 ^y
Yes	279 (80.4)	47 (68.1)		
Massage with hard fruit/vegetable				
No	129 (37.2)	38 (55.1)	7.672	0.006 ^x
Yes	218 (62.8)	31 (44.9)		
Herbal products				
No	281 (81)	61 (88.4)	1.692	0.193 ^y
Yes	66 (19)	8 (11.6)		
Amber necklace				
No	282 (81.3)	61 (88.4)	1.563	0.211 ^y
Yes	65 (18.7)	8 (11.6)		
No method used				
No	332 (95.7)	63 (91.3)	-	0.136 ^z
Yes	15 (4.3)	6 (8.7)		

^x Pearson's chi-square test; ^y Yates' continuity correction; ^z Fisher's exact test; $p < 0.05$; n (%) = frequency (percentage)

Information and Consultation Sources

When the sources of information and consultation regarding the teething period were examined, no significant gender-related differences were found in any of the items ($p > 0.05$), except that fathers sought medical advice significantly more often than mothers in response to teething-related symptoms ($p = 0.010$). Specifically, 65.2% of fathers consulted a doctor, compared with 48.1% of mothers. With respect to age groups, receiving doctor's advice was significantly more frequent among parents aged 30–39 years (61.2%) and least common among those aged 40–49 years (39.8%) ($p = 0.000$). In contrast, the use of the internet and social media as information sources was more prevalent among parents aged 20–29 years ($p =$

0.027). As education level increased, the rates of receiving doctor's advice ($p = 0.005$), verifying online information with a healthcare professional ($p = 0.000$), preferring healthcare workers as the most reliable source of information ($p = 0.004$) and seeking professional advice before applying any method ($p = 0.016$) all increased significantly. Parents with higher levels of education were significantly more likely to use social media as an information source ($p = 0.001$), whereas reliance on advice from family members did not differ significantly by education level ($p = 0.455$) (Table 4). No statistically significant association was found between income level and sources of information or consultation ($p > 0.05$).

Table 4. Association between education level and sources of information and consultation

Variable	Primary/Secondary n (%)	High school n (%)	University n (%)	Postgraduate n (%)	No formal education n (%)	Total n (%)	p ^x
Doctor's consultation							
No	15 (51.7) ^{ab}	31 (49.2) ^b	111 (46.6) ^{ab}	26 (32.9) ^b	7 (100) ^a	190 (45.7)	0.005*
Yes	14 (48.3) ^{ab}	32 (50.8) ^b	127 (53.4) ^{ab}	53 (67.1) ^b	0 (0) ^a	226 (54.3)	
Advice from family/relatives							
No	16 (55.2)	25 (39.7)	91 (38.2)	29 (36.7)	2 (28.6)	163 (39.2)	0.455*
Yes	13 (44.8)	38 (60.3)	147 (61.8)	50 (63.3)	5 (71.4)	253 (60.8)	
Internet/social media							
No	28 (96.6) ^a	49 (77.8) ^{ab}	159 (66.8) ^b	54 (68.4) ^b	7 (100) ^a	297 (71.4)	0.001*
Yes	1 (3.5) ^a	14 (22.2) ^{ab}	79 (33.2) ^b	25 (31.7) ^b	0 (0) ^a	119 (28.6)	
Rely on own experience							
No	15 (51.7)	46 (73.0)	141 (59.2)	55 (69.6)	3 (42.9)	260 (62.5)	0.072*
Yes	14 (48.3)	17 (27.0)	97 (40.8)	24 (30.4)	4 (57.1)	156 (37.5)	
Consulted a doctor or dentist for teething symptoms							
Yes	18 (62.1)	36 (57.1)	114 (47.9)	41 (51.9)	3 (42.9)	212 (51.0)	0.475*
No	11 (37.9)	27 (42.9)	124 (52.1)	38 (48.1)	4 (57.1)	204 (49.0)	
Most trusted source of information							
Doctor/dentist	14 (48.3) ^a	49 (77.8) ^b	175 (73.5) ^b	64 (81.0) ^b	1(14.3) ^a	303 (72.8)	0.004*
Internet	0 (0)	1 (1.6)	5 (2.1)	3 (3.8)	0 (0)	9 (2.2)	
Family elders	7 (24.1) ^{ab}	7 (11.1) ^{ab}	22 (9.2) ^b	5 (6.3) ^b	3 (42.9) ^a	44 (10.6)	
Social media	0 (0)	0 (0)	5 (2.1)	0 (0)	0 (0)	5 (1.2)	
Self-observation/experience	8 (27.6)	6 (9.5)	31 (13.0)	7 (8.9)	3 (42.9)	55 (13.2)	
Do you verify information from the internet?							
Yes, I confirm via specialist	16 (55.2)	36 (57.1)	168 (70.6)	61 (77.2)	3 (42.9)	284 (68.3)	<0.001 ^x
Sometimes	11 (37.9)	23 (36.5)	65 (27.3)	16 (20.3)	1 (14.3)	116 (27.9)	
No I rely on it without checking	2 (6.9) ^{ab}	2 (3.2) ^{ab}	2 (0.4) ^b	1 (1.3) ^b	3 (42.9) ^a	12 (2.9)	
I don't research	0 (0) ^a	2 (3.2) ^{ab}	4 (1.7) ^b	1 (1.3) ^b	3 (42.9) ^a	12 (2.9)	
Do you consult healthcare personel before applying methods?							
Yes, for all methods	6 (20.7)	26 (41.3)	63 (26.5)	30 (38.0)	0 (0)	125 (30.0)	0.0016 ^x
Yes, for some methods	19 (65.5)	33 (52.4)	154 (64.7)	45 (57.0)	4 (57.1)	255 (61.3)	
No, I don't consult	4 (13.8) ^a	4 (6.4) ^{ab}	21 (8.8) ^b	4 (5.1) ^b	3 (42.9) ^a	36 (8.6)	

^x: Fisher's exact test with Monte Carlo correction; $p < 0.05$; ^{a-b}: Values with the same superscript letter indicate no significant difference between groups; n (%)

Parental Knowledge about Primary Dentition

Parents demonstrated a high rate of correct responses to general knowledge questions regarding the teething process, including the timing of eruption, the first tooth to erupt and the completion of primary dentition. However, when asked whether delayed tooth eruption could be a sign of a systemic disease, the correct response rate was low (38.5%), and "I don't know" was the most frequently selected answer (42.3%). A statistically significant difference was found for this question ($p = 0.038$), indicating that awareness of pathological conditions increased with education level. The highest proportion of correct responses was observed among parents with postgraduate education (55.7%), while lower rates were reported among those with high school (38.1%) and university-level education (33.2%) (Table 5). In terms of household income, a significant difference was found only for the question 'Primary teeth usually complete eruption by the age of two' ($p = 0.027$); however, the effect size was small and this difference is unlikely to be clinically relevant. No statistically significant associations were found between knowledge level and gender or age ($p > 0.05$).

Discussion

Parents' perceptions and practices regarding teething play a crucial role in the accurate interpretation and appropriate management of symptoms. The findings of the present study demonstrate that parental knowledge and behaviours related to the teething period are not independent of sociodemographic characteristics. In particular, gender, age and education level were found to be significantly associated with several variables, whereas income level had a comparatively limited influence. Therefore, the null hypothesis suggesting that parental approaches are not affected by sociodemographic factors was generally rejected.

Symptoms such as fever, diarrhoea and irritability observed during the primary dentition period are more likely to be associated with physiological changes in growth and immune development rather than tooth eruption itself. The decline in passive maternal immunity during this stage increases children's susceptibility to respiratory, urinary tract and otitis media infections, which may present with fever, appetite loss or irritability.^{7,22,25,26} Inadequate hygiene conditions may further contribute to these symptoms.²⁶⁻²⁹ Fever accompanied by facial rash and loss of appetite may

also be attributed to herpes simplex virus infection, which is commonly mistaken for teething.¹⁴ Additionally, the incidence of gastroenteritis has been reported to increase after the age of six months.³⁰ This increase is associated with the introduction of complementary feeding, use of pacifiers and feeding bottles, exposure to contaminated food and the

oral exploratory behaviour characteristic of this developmental stage, all of which impair hygiene and increase susceptibility to infection.³¹ These findings suggest that parents may be inclined to misattribute systemic symptoms—occurring concurrently with physiological teething—to the teething process itself.

Table 5. Association between education level and knowledge about the primary dentition period

Knowledge Statement	Primary/Secondary n (%)	High School n (%)	University n (%)	Postgraduate n (%)	No Formal Education n (%)	Total n (%)	p ^x
“Primary teeth generally begin to erupt at 6–7 months of age.”							
Yes	25 (86.2)	50 (79.4)	200 (84.0)	73 (92.4)	6 (85.7)	354 (85.1)	0.281*
No	1 (3.5)	2 (3.2)	12 (5.0)	1 (1.3)	1 (14.3)	17 (4.1)	
I don’t know	3 (10.3)	11(17.5)	26 (10.9)	5 (6.3)	0 (0)	45 (10.8)	
“Lower central incisors are usually the first teeth to erupt.”							
Yes	22 (75.9)	54(85.7)	204 (85.7)	73 (92.4)	6 (85.7)	359 (86.3)	0.196*
No	1 (3.5)	2 (3.2)	16 (6.7)	3 (3.8)	0 (0)	22 (5.3)	
I don’t know	6 (20.7)	7 (11.1)	18 (7.6)	3 (3.8)	1 (14.3)	35 (8.4)	
“Eruption of primary teeth is usually completed around the age of two years.”							
Yes	23 (79.3)	46 (73.0)	164 (68.9)	60 (75.9)	6 (85.7)	299 (71.9)	0.841*
No	1 (3.5)	4 (6.4)	25 (10.5)	8 (10.1)	0 (0)	38 (9.1)	
I don’t know	5 (17.2)	13(20.6)	49 (20.6)	11 (13.9)	1 (14.3)	79 (19.0)	
“Delayed tooth eruption may be a sign of systemic disease.”							
Yes	9 (31.0)	24 (38.1)	79 (33.2)	44 (55.7)	4 (57.1)	160 (38.5)	0.038*
No	6 (20.7)	15 (23.8)	46 (19.3)	12 (15.2)	1 (14.3)	80 (19.2)	
I don’t know	14 (48.3)	24(38.1)	113 (47.5)	23 (29.1)	2 (28.6)	176 (42.3)	

* :Fisher's exact test with Monte Carlo correction; $p < 0.05$; n (%).

In our study, the most frequently reported symptoms during the teething period were a desire to bite objects (95.0%), gingival itching (92.3%), irritability (90.1%), drooling (81.0%) and loss of appetite (80.5%). Conversely, systemic symptoms such as fever (74.8%) and diarrhoea (48.1%) were reported less frequently. These results indicate that teething is predominantly associated with local and self-limiting symptoms, whereas systemic manifestations are more prone to misinterpretation. Previous studies similarly reported that a substantial proportion of parents attribute fever, diarrhoea and vomiting to teething.^{8,22,32} However, in contrast to the findings of Markman,³³ more than half of the parents in our sample (54.6%) did not associate teething with systemic illnesses. This suggests that although parental knowledge was generally satisfactory, traditional beliefs and misconceptions still persist among a notable proportion of parents.

Historically, a variety of pharmacological and traditional remedies have been used to manage teething-related discomfort. The American Academy of Pediatric Dentistry (AAPD) recommends systemic oral analgesics in combination with chilled teething rings for symptom relief.³⁴ The application of cold alleviates discomfort by

inducing vasoconstriction in dilated blood vessels and providing temporary anaesthesia of the gingival tissues, while pressure, chewing and gingival massage help to reduce pain by modulating sensory receptor activity.^{32,35} In the present study, the most commonly used methods were non-pharmacological strategies, including teething rings (78.4%), gum massage with firm fruits or vegetables (59.9%) and cold application (32.9%). Pharmacological methods, such as teething gels (38.0%) and analgesic medication (37.7%), were used less frequently. These findings demonstrate that most parents prefer natural or physical methods of relief, resorting to medication only when necessary. Comparable results have been reported in studies from Türkiye^{13,19,20} and other countries,^{1,36} where non-pharmacological comfort-based practices remain the primary approach, while pharmacological interventions are generally reserved for more pronounced symptoms.

In our study, the majority of participants were mothers, which may be attributed to the fact that caregiving responsibilities during early childhood are predominantly undertaken by mothers. This finding aligns with the literature, which reports that mothers play a more active role in children's nutrition, daily care and

health-related decision-making processes.^{15,32,37,38} Accordingly, mothers are also likely to be the primary individuals who recognise, interpret and manage symptoms associated with teething. Furthermore, children's oral health-related attitudes and behaviours are closely linked to the oral health literacy of the primary caregiver. Oral health literacy encompasses not only knowledge but also the ability to recognise a child's oral health needs, maintain appropriate preventive practices, seek professional care when necessary and make informed health-related decisions.³⁹ Therefore, the high participation rate of mothers in the present study may be due not only to sociocultural roles but also to their position as the main decision-makers regarding their children's oral health. However, this may also be considered a limitation of the study, as it restricts the representation of fathers' perspectives.

Parents' information-seeking and consultation behaviours were found to vary according to gender, age and education level. Male parents were more willing to consult a doctor regarding teething symptoms, whereas mothers—who are more actively involved in day-to-day childcare—more frequently relied on social networks and traditional knowledge sources. Among younger parents, the use of the internet and social media as sources of information was more prevalent. Similarly, a study conducted in Türkiye reported that parents did not always consult healthcare professionals for teething-related concerns but frequently relied on the internet for information.⁴⁰

Higher levels of education were associated with increased caution towards unverified online information, as well as higher rates of consulting healthcare professionals and verifying the accuracy of information. This finding suggests that health literacy improves in parallel with educational attainment. In contrast, income level did not significantly influence access to information or consultation behaviours. These results support the findings of El-Gilany and Abusaad, and Allam, who reported a significant relationship between education level and knowledge about teething, whereas socioeconomic status was not found to be a determining factor.^{14,17} However, some studies have failed to demonstrate this association.^{26,41} Such discrepancies may be attributed to differences in the sociocultural characteristics of the populations studied, sample structures or the methodologies used to assess knowledge.

Delayed tooth eruption should not be considered solely as a physiological variation; it may also be a clinical indicator of nutritional deficiencies, endocrine disorders such as hypopituitarism and hypothyroidism, HIV infection, or genetic and systemic conditions such as cleidocranial dysplasia and Down syndrome.⁴²⁻⁴⁴ Therefore, parental awareness of this issue is essential for recognising delayed eruption as a potential health concern. In the present study, parents demonstrated generally adequate knowledge regarding primary dentition; however, no significant association was found

between knowledge level and socioeconomic status. Conversely, awareness that delayed tooth eruption could be related to systemic disease increased significantly with higher levels of education. This finding is consistent with previous literature.^{1,8} Nonetheless, some studies have reported that knowledge is associated with other socioeconomic variables such as education, income and occupation.²² These inconsistencies may result from differences in measurement tools, characteristics of the study populations or cultural variations in health behaviours.

These findings should be considered within the limitations of the study. As the research was carried out in a single centre with participants from a specific geographical region, the sample may not fully represent parents from different regions, cultural backgrounds or socioeconomic conditions, and thus the generalisation of the results should be approached with caution. In addition, the use of a self-reported questionnaire introduces potential biases such as recall bias, social desirability bias and subjective interpretation. Moreover, the predominance of high-income participants resulted in a skewed socioeconomic distribution, which may have limited the detection of income-related associations in this study. Therefore, the findings related to income level should be interpreted with caution. The cross-sectional design of the study prevents the establishment of causal relationships between variables and allows only the description of existing conditions. Although the questionnaire was developed based on previous literature and revised with expert input, cultural differences may have led to varied interpretations of some questions. Furthermore, the predominance of mothers in the sample may have resulted in limited representation of fathers' perspectives. Future research should aim to include multi-centre, longitudinal and mixed-method studies covering diverse socioeconomic and cultural settings, as well as comparative studies involving both parents and healthcare professionals, to provide a more comprehensive understanding of parental knowledge and practices regarding teething.

Conclusions

The findings of this study indicate that although parents generally possess an adequate level of knowledge regarding teething, certain misconceptions and inappropriate practices still persist. Education level and gender significantly influenced parents' access to information and consultation behaviours, and misinterpretation of teething symptoms may lead to unnecessary medication use, excessive reliance on herbal remedies, delayed professional consultation or overlooking underlying systemic conditions. Providing parents with structured, evidence-based oral health education during routine paediatric, dental and family medicine visits may support accurate symptom assessment, promote safer caregiving practices and facilitate the early recognition of pathological conditions. Beyond individual clinical guidance, these findings also

highlight important public health implications: enhancing parental awareness through community-based programmes and integrating teething-related education into national early childhood oral health strategies may reduce preventable risks associated with misinterpreted symptoms and support more consistent, evidence-based caregiving practices across diverse sociocultural settings.

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Conflicts of Interest Statement

The authors declare no conflict of interest.

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