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Original Article

Maternal knowledge, attitudes, and practices regarding childhood fever: a cross-sectional study

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ABSTRACT

Background. Fever remains one of the most common reasons for pediatric visits and is a key issue in family health literacy. Misconceptions and fears often lead to inappropriate interventions or delayed medical care. Understanding mothers' perceptions of childhood fever is essential for effective health education. This study explored maternal attitudes and practices regarding fever to inform future health education strategies and guideline development.

Methods. A cross-sectional, descriptive study was conducted via face-to-face interviews with mothers of children attending a tertiary pediatric outpatient clinic for non-febrile complaints. Primary outcomes included knowledge of fever definition, medication use, and home remedies. Secondary outcomes assessed the impact of sociodemographic factors and reasons for seeking care. Incorrect antipyretic administration (inappropriate dose or dosing interval) was analyzed using multivariable logistic regression.

Results. Of 1000 participating mothers (aged 18–51, mostly high school graduates), 73.8% administered the correct antipyretic dose, while 15.7% used insufficient and 4.3% excessive doses. The main concern (93%) was preventing febrile convulsions. Traditional advice (45.4%) and online sources (32.4%) were frequently consulted. In infants under one year, mothers more often contacted a physician instead of using antipyretics at 38 °C. Tepid sponging with vinegar was less used in children under 1 and those aged 2–3 years at 40 °C. Multivariable analysis showed that lower maternal education, absence of a home thermometer, prematurity history, and absence of a family history of febrile seizures were independently associated with incorrect antipyretic administration; the strongest association was observed for absence of a home thermometer (adjusted odds ratio: 2.74, 95% confidence interval: 1.89–3.98). Mothers of adolescents (12–18 years) were less likely to use home-based interventions and showed a greater tendency toward seeking medical care at 38 °C. Families with one child were less likely to undress the child during a fever compared to those with multiple children.

Conclusions. Targeted education addressing misconceptions and inappropriate fever management practices could enhance outcomes and reduce unnecessary healthcare utilization.

Key words: childhood, fever, home remedies, mothers, health knowledge, attitudes, practices.

Childhood fevers represent a significant health literacy challenge for families and frequently lead to hospital visits.[1] In 44% to 66% of instances, a body temperature of at least 38 °C is reported as a fever, showing differences both between and within nations.[2-6] A fever is a natural reaction to infections that may indicate severe illness.[7] The fear of complications like febrile convulsions, brain damage, coma, dehydration, or even death leads many parents to treat even minor increases in their children's body temperature.[3,8]

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Parents' misconceptions and fears about childhood fever, often referred to as "fever phobia"[9], lead to inappropriate interventions and home remedies such as administering antipyretics even at normal body temperatures; waking the child for temperature checks; sponging with cold water, vinegar, or alcohol; wrapping the child in blankets; using antibiotics instead of antipyretics; and improper dosing and timing of antipyretic medications. The child's health can be negatively impacted by all these measures.[2,7,10] Child discomfort-related anxiety in families results in application delays and unnecessary medical visits, contributing to healthcare system strain.[11,12] The standard practice in medical facilities is for caregivers to expect a definitive fever diagnosis, antipyretics, and blood work.[13]

The goal of this study was to examine the knowledge and attitudes of Turkish mothers concerning childhood fever, focusing on its definition, appropriate medication, and home remedies. The secondary outcome focused on examining the impact of sociodemographic factors on maternal knowledge and fever management practices, as well as identifying the reasons for seeking medical care, and factors associated with incorrect antipyretic administration. This study sought to improve clinical reports used in educating mothers.

Materials and Methods

Study design and participants

Between March 2022 and March 2023, a descriptive, cross-sectional study was conducted using face-to-face interviews with mothers whose children were referred to the pediatric outpatient clinics of the University of Health Sciences, Zeynep Kamil Maternity and Children's Training and Research Hospital in İstanbul, Türkiye, for complaints other than fever. The study adopted a quantitative approach, focusing on measurable outcomes, despite incorporating face-to-face interviews and selected open-ended questions.

Ethical approval was obtained from the Hospital Ethics Committee (date: 23 February 2022; decision number: 26). Participation was voluntary, and all participants were informed about the study objectives and confidentiality measures. Verbal informed consent was obtained from each participating mother prior to enrollment.

A sample size of 1,000 mothers was calculated to provide generalizable results for Türkiye with a 95% confidence level and a 3.1% margin of error. Sample adequacy for multivariable analysis was assessed using G*Power (version 3.1.9.7), assuming a two-sided α of 0.05, 80% power, proportions of 0.20 and 0.28, and an allocation ratio of 1, which indicated a minimum required sample size of 894 participants. Eligible participants included mothers of children aged 1 month to 18 years who presented with non-febrile complaints. Mothers who were not the primary caregivers, whose children had an active fever at presentation, or who declined to participate were excluded.

Questionnaire and data collection

Data were collected using a structured questionnaire developed based on previous similar studies and reviewed for content validity by two pediatricians.[2,8] The questionnaire comprised 31-items organized into six thematic sections addressing demographic characteristics, fever history and equipment, knowledge about childhood fever, fever management practices, practices to specific fever thresholds (38 °C, 39 °C, and 40 °C), and sources of information. The full questionnaire and definitions of fever management practices are provided in Supplementary Table S1.

Fever management practices were defined in advance to ensure consistency in data interpretation. *Home observation* was defined as monitoring the child at home without immediate medical consultation while observing general condition and symptoms. *Reducing clothing layers* referred to removing excess clothing to facilitate heat loss and improve thermal comfort. *Excessive covering with blankets* was defined as covering the child with multiple or

thick blankets despite the presence of fever. *Tepid sponging* referred to wiping the child's body with lukewarm water (approximately 32–35 °C) to reduce discomfort associated with fever. *Application of alcohol* was defined as applying alcohol to the skin (e.g., rubbing or wiping) as a traditional method intended to reduce body temperature. *Application of a vinegar-soaked cloth* referred to placing cloths soaked in diluted vinegar on the child's body as a traditional fever-reducing practice. A *lukewarm shower or bath* was defined as bathing the child with lukewarm water to provide symptomatic relief during fever, whereas *cold bathing* referred to bathing the child with cold water in an attempt to rapidly reduce body temperature. *Oral antipyretic formulation* was defined as the administration of antipyretic medication via the oral route, including liquid or solid formulations.

The questionnaire included both closed-ended and open-ended questions, with selected items allowing multiple responses. Completion of the questionnaire required approximately 7–10 minutes and was conducted through face-to-face interviews by trained pediatricians. For questions permitting multiple responses, each option was analyzed independently; percentages may not total 100%. Frequencies represent the number of mothers selecting each option.

Caregiver-reported antipyretic doses were evaluated by recalculating weight-adjusted dosing according to the child's body weight and standard dosing recommendations. Recommended dosages were defined as 10–15 mg/kg per dose for paracetamol and 10 mg/kg per dose for ibuprofen, with administration intervals of 4–6 hours and 6–8 hours, respectively.[14] Administration was considered appropriate when the reported dose and interval were within these recommended ranges; otherwise, it was classified as inappropriate antipyretic administration.

Open-ended responses were analyzed using thematic content analysis. Responses were independently categorized by two researchers, and any discrepancies were resolved through consensus. All completed questionnaires were stored securely to ensure participant confidentiality until data analysis was initiated.

Statistical analysis

For statistical analysis, we used the NCSS 2007 Statistical Software (Number Cruncher Statistical System, Utah, USA). Categorical data are shown as frequencies and percentages; continuous data as means ± standard deviations. Normality of continuous variable distributions was evaluated via the Kolmogorov-Smirnov test. Depending on suitability, Pearson's chi-square or Fisher's exact test was used to compare categorical variables. Comparisons between groups of mothers, stratified by educational level, age, and number of children, were conducted using the chi-square test to assess differences in practices and attitudes. For repeated categorical responses across the three fever temperature scenarios (38 °C, 39 °C, and 40 °C), Cochran's Q test was used. Multivariable analysis was performed using binary logistic regression to identify factors independently associated with incorrect antipyretic administration. The variables entered into the model were maternal age, maternal educational level, child age, child sex, family history of febrile seizures, home thermometer availability, and history of prematurity; selected on the basis of clinical relevance and previous literature2,8, and our study population characteristics. Adjusted odds ratios (aORs) with 95% confidence intervals (CIs) were calculated. A p-value of less than 0.05 was considered statistically significant.

Results

Demographic characteristics of the participants

The demographic and family characteristics of the 1,000 participants are summarized in Table I. Most parents (77.2%) reported having previous experience managing childhood fever.

Table I. Participant characteristics and their family histories

Variable	Value
Child's age, months	29 (1-204)
<1 year	439 (29.4%)
1–3 years	149 (23.2%)
4–5 years	111 (12.2%)
6–11 years	213 (24.3%)
12–18 years	88 (10.9%)
Male child	554 (55.4%)
Multiple pregnancy	39 (3.9%)
Number of children in the family	2 (1–7)
Single child	297 (29.7%)
Two children	473 (47.3%)
Three children	167 (16.7%)
≥4 children	63 (6.3%)
Mother's age, years	31.4 ± 6.1 (18–51)
≤24 years	137 (13.7%)
25–34 years	568 (56.8%)
35–44 years	273 (27.3%)
≥45 years	22 (2.2%)
Maternal education	
Illiterate	27 (2.7%)
Primary school	308 (30.8%)
Secondary school	105 (10.5%)
High school	413 (41.3%)
University	139 (13.9%)
Doctorate	8 (0.8%)
Family history	
Prematurity	230 (23.0%)
Epilepsy/seizures	114 (11.4%)
Febrile convulsions	167 (16.7%)
Chronic disease	154 (15.4%)

Continuous variables are presented as mean ± standard deviation for normally distributed data and as median (minimum–maximum) for non-normally distributed data. Categorical variables are presented as counts and percentages, n (%).

Fever history and equipment

Thermometer ownership was common, reported by 85.4% of families, predominantly digital thermometers (75.4%); 20.6% of households owned more than one thermometer. Antipyretics were available in 94% of households, most commonly paracetamol (59.9%) or a combination of paracetamol and ibuprofen (29.0%).

Fever definition and sources of information

Among 977 mothers, the mean axillary temperature threshold defining fever was 37.8 ± 1.3 °C. Correct identification of 35 °C as the hypothermia threshold was achieved by only 38.7% of respondents, while 49.6% were unable to provide a definition.

Healthcare professionals were reported as a source of fever-related information by 74.6% of respondents. Older family members (45.4%) and social media (32.4%) were also frequently cited, whereas formal education and books accounted for only 5.1%.

Regarding perceptions of fever, most mothers believed that fever could lead to febrile seizures (n = 920), brain damage (n = 567), or severe illness (n = 308).

Effects of maternal education level on fever management practices

Liquid antipyretic formulations, predominantly paracetamol, and inaccurate dosing were more frequently reported among mothers with lower levels of education (below high school level) (Table II). Lower maternal education was independently associated with incorrect antipyretic administration. Maternal education level was significantly associated with higher rates of thermometer ownership ($p<0.001$).

Waking children to assess body temperature showed no significant variation according to maternal education level ($p=0.123$). In contrast, education level significantly influenced information sources: mothers with lower education more frequently relied on older family members, whereas mothers with higher education levels more often consulted healthcare professionals, books, and social media ($p<0.001$).

Table II. Effects of maternal educational level on different parameters regarding fever management

Variable	Primary (n=308)	Secondary (n=105)	High school (n=413)	University (n=139)	p-value
Thermometer at home, present	238 (77.3)	88 (83.8)	370 (89.6)	130 (93.5)	**<0.001**
≥2 thermometers at home, present	17 (5.5)	18 (17.1)	107 (25.9)	49 (35.3)	**<0.001**
Waking a child for measurement	176 (57.1)	65 (61.9)	245 (59.3)	68 (48.9)	0.123
Antipyretic					
Paracetamol	221 (71.8)	51 (48.6)	242 (58.6)	61 (43.9)	**<0.001**
Ibuprofen	16 (5.2)	5 (4.8)	16 (3.9)	7 (5.0)	
Combination	71 (23.1)	49 (46.7)	155 (37.5)	71 (51.1)	
As syrup	200 (64.9)	62 (59.0)	263 (63.7)	108 (77.7)	**<0.001**
As suppository	41 (13.3)	8 (7.6)	50 (12.1)	6 (4.3)	
Combined use or tablet form	67 (21.8)	35 (33.3)	100 (24.2)	25 (18.0)	
Correct timing	201 (65.3)	73 (69.5)	318 (77.0)	121 (87.1)	**<0.001**
Incorrect usage	97 (31.5)	24 (22.9)	97 (23.5)	30 (21.6)	**0.032**
Source of information*					
Family elders' advice	144 (46.8)	34 (32.4)	218 (52.8)	43 (30.9)	**<0.001**
Neighbors	46 (14.9)	20 (19.0)	31 (7.5)	8 (5.8)	**<0.001**
Physician/healthcare worker	216 (70.1)	67 (63.8)	327 (79.2)	111 (79.9)	**<0.001**
Social media	41 (13.3)	24 (22.9)	197 (47.7)	55 (39.6)	**<0.001**
Books	5 (1.6)	1 (1.0)	18 (4.4)	19 (13.7)	**<0.001**
Degree of education	1 (0.3)	0 (0.0)	2 (0.5)	4 (2.9)	**0.015**
Reasons for preventing fever*					
To relieve child	113 (36.7)	29 (27.6)	245 (59.3)	60 (43.2)	**<0.001**
To prevent organ damage	101 (32.8)	28 (26.7)	206 (49.9)	42 (30.2)	**<0.001**
To prevent seizures	284 (92.2)	97 (92.4)	393 (95.2)	124 (89.2)	**<0.001**
To prevent disability	88 (28.6)	20 (19.0)	173 (41.9)	15 (10.8)	**<0.001**
To treat fever	126 (40.9)	26 (24.8)	225 (54.5)	56 (40.3)	**<0.001**
Fever may cause*					
Serious disease	91 (29.5)	20 (19.0)	156 (37.8)	31 (22.3)	**<0.001**
Brain damage	163 (52.9)	45 (42.9)	274 (66.3)	67 (48.2)	**<0.001**
Seizure	283 (91.9)	95 (90.5)	383 (92.7)	127 (91.4)	0.854
Coma	109 (35.4)	30 (28.6)	133 (32.2)	23 (16.5)	**<0.001**
Death	86 (27.9)	26 (24.8)	97 (23.5)	21 (15.1)	**0.026**

Values are presented as n (%) within each maternal education subgroup. Comparisons were performed using the chi-square test or Fisher's exact test.
*Column percentages may exceed 100% for multiple-response items.

Recognition of the role of education in fever management was significantly higher among university-educated mothers (p = 0.015). This group expressed lower concern regarding severe fever-related outcomes and was less likely to administer antipyretics to prevent seizures or disability.

Effect of previous fever experience on maternal practices

Mothers with prior fever management experience more frequently owned multiple thermometers and used a wider range of antipyretic formulations. This group also

demonstrated significantly greater knowledge of correct dosing and dosing intervals (p=0.001).

Effects of maternal age

Mothers aged ≥45 years were more likely to report the absence of antipyretics at home (22.7%) and were less likely to wake their child to measure body temperature (31.8%) compared with mothers younger than 45 years (both p<0.001). Concern about fever reduction for comfort (p=0.017), organ protection (p<0.001), and treatment purposes (p=0.002) was also significantly lower in this age group (Table III).

Reliance on older family members (p=0.018) and social media (p=0.008) was less frequent among older mothers (>45 years). Mothers younger than 24 years more often preferred rectal antipyretic formulations, predominantly paracetamol, and showed significantly lower adherence to recommended dosing intervals (p=0.001). Maternal age was not significantly associated with correct dosage (p=0.591). Concerns regarding fever-related coma, brain damage, and death were more prevalent among mothers younger than 45 years.

Table III. Effects of maternal age according to age groups

Variable	≤24 years (n=137)	25–34 years (n=568)	35–44 years (n=273)	≥45 years (n=22)	p-value
Thermometer at home, present	100 (73.0)	504 (88.7)	238 (87.2)	12 (54.5)	**<0.001**
≥2 thermometers at home, present	15 (10.9)	123 (21.7)	56 (20.5)	5 (22.7)	**0.043**
Antipyretic at home, present	118 (86.1)	545 (96.0)	260 (95.2)	17 (77.3)	**<0.001**
Time interval of antipyretics, appropriate	80 (58.4)	430 (75.7)	213 (78.0)	14 (63.6)	**<0.001**
Correct volume of antipyretics	96 (70.1)	424 (74.6)	206 (75.5)	15 (68.2)	0.591
Waking the child up for temperature measurement	99 (72.3)	339 (59.7)	128 (46.9)	7 (31.8)	**<0.001**
Source of fever information*					
Family elders	77 (56.2)	259 (45.6)	110 (40.3)	8 (36.4)	**0.018**
Neighbors	13 (9.5)	52 (9.2)	40 (14.7)	4 (18.2)	0.065
Physician, healthcare worker	95 (69.3)	433 (76.2)	203 (74.4)	15 (68.2)	0.350
Social media	42 (30.7)	205 (36.1)	72 (26.4)	3 (13.6)	**0.008**
Books	1 (0.7)	31 (5.5)	12 (4.4)	0 (0.0)	0.075
Degree of education	0 (0.0)	4 (0.7)	3 (1.1)	0 (0.0)	0.627
Reasons for preventing fever*					
To relieve the child	68 (49.6)	276 (48.6)	111 (40.7)	5 (22.7)	**0.017**
To prevent organ damage	70 (51.1)	240 (42.3)	77 (28.2)	3 (13.6)	**<0.001**
To prevent seizures	127 (92.7)	535 (94.2)	248 (90.8)	19 (86.4)	0.165
To prevent disability	65 (47.4)	185 (32.6)	52 (19.0)	3 (13.6)	**<0.001**
To treat fever	75 (54.7)	264 (46.5)	101 (37.0)	7 (31.8)	**0.002**
Fever may cause*					
Serious disease	66 (48.2)	183 (32.2)	58 (21.2)	1 (4.5)	**<0.001**
Brain damage	89 (65.0)	344 (60.6)	129 (47.3)	5 (22.7)	**<0.001**
Seizures	129 (94.2)	523 (92.1)	250 (91.6)	18 (81.8)	0.257
Coma	67 (48.9)	177 (31.2)	58 (21.2)	4 (18.2)	**<0.001**
Death	54 (39.4)	138 (24.3)	43 (15.8)	3 (13.6)	**<0.001**

Values are presented as n (%) within each maternal age subgroup. Group comparisons were performed using the chi-square test or Fisher's exact test.
*Column percentages may exceed 100% for multiple-response items.

Family practices at different degrees of fever and by child age

Fever management practices at different temperature levels are summarized in Table IV. Home-based interventions were more commonly reported at 38 °C, whereas seeking medical consultation and antipyretic use predominated at 39 °C and 40 °C ($p<0.05$).

Families with more than one child were more likely to remove clothing from their child at 39 °C ($p=0.001$), with lower rates among single-child families (28.78%) compared with families with two (37.12%) or more than three children (47.24%). The number of children did not significantly influence other practices.

Liquid antipyretic use at 38 °C was significantly lower among children aged <1 year ($p=0.042$) (Table V). Mothers of adolescents (12–18 years) showed a tendency toward seeking medical care and were less likely to use home-based

Table IV. Parents' practice at different axillary temperatures (38, 39, and 40 °C)

Variable	38 °C	39 °C	40 °C	p-value
Staying at home	373 (37.3)	64 (6.4)	4 (0.4)	**<0.001**
Taking off clothes	585 (58.5)	348 (34.8)	217 (21.7)	**<0.001**
Wrapping with blanket	6 (0.6)	5 (0.5)	1 (0.1)	0.172
Tepid sponging	368 (36.8)	152 (15.2)	69 (6.9)	**<0.001**
Sponging with alcohol	2 (0.2)	0 (0.0)	0 (0.0)	0.135
Sponging with vinegar	98 (9.8)	36 (3.6)	15 (1.5)	**<0.001**
Lukewarm shower	405 (40.5)	358 (35.8)	168 (16.8)	**<0.001**
Bath in cold water	24 (2.4)	25 (2.5)	18 (1.8)	0.581
Antipyretic syrup administration	701 (70.1)	672 (67.2)	539 (53.9)	**<0.001**
Antipyretic suppository application	124 (12.4)	110 (11.0)	82 (8.2)	**0.007**
Calling the doctor	74 (7.4)	68 (6.8)	33 (3.3)	**<0.001**
Hospital admission	440 (44.0)	868 (86.8)	988 (98.8)	**<0.001**
Antibiotic administration	6 (0.6)	6 (0.6)	4 (0.4)	0.778

Data are presented as n (%). As responses were obtained from the same individuals across the three temperature scenarios, differences in proportions were analyzed using Cochran's Q test. All observations were complete (n=1000).

Table V. Maternal fever practice with different age groups of children

		<1 years n=439	2–3 years n=149	4–5 years n=111	6–11 years n=213	12–18 years n=88	p-value
38° C	Staying at home	180 (41.0)	65 (43.6)	42 (37.8)	73 (34.3)	15 (17.0)	**<0.001**
	Take off clothes	283 (64.5)	87 (58.4)	72 (64.9)	111 (52.1)	30 (34.1)	**<0.001**
	Tepid sponging	180 (41.0)	53 (35.6)	40 (36.0)	73 (34.3)	21 (23.9)	**0.036**
	Syrup antipyretic use	286 (65.1)	115 (77.2)	80 (72.1)	158 (74.2)	64 (72.7)	**0.042**
39° C	Take off clothes	175 (39.9)	64 (43.0)	39 (35.1)	54 (25.4)	18 (20.5)	**<0.001**
	Calling the doctor	39 (8.9)	14 (9.4)	5 (4.5)	9 (4.2)	3 (3.4)	**0.047**
40° C	Take off clothes	110 (25.1)	39 (26.2)	19 (17.1)	42 (19.7)	10 (11.4)	**0.013**
	Sponging with vinegar	3 (0.7)	0 (0.0)	4 (3.6)	4 (1.9)	3 (3.4)	**0.041**
	Syrup antipyretic use	219 (49.9)	79 (53.0)	56 (50.5)	129 (60.6)	56 (63.6)	**0.027**
	Suppository antipyretic use	43 (9.8)	10 (6.7)	8 (7.2)	9 (4.2)	12 (13.6)	**0.042**

Data are presented as n (%) within each child age subgroup. Differences across age groups were analyzed using the chi-square test.

interventions such as undressing or sponging (p<0.05). At 39 °C, physician contact was more frequent among mothers of infants (p=0.047). At 40 °C, mothers of older children were less likely to remove clothing (p = 0.013). Across all age groups, antipyretic use increased significantly at 40 °C (p<0.05). Child age was not independently associated with incorrect antipyretic administration. Vinegar-soaked cloth application at 40 °C was less frequent among children aged <1 year and 2–3 years (p=0.041).

Multivariable analysis of factors associated with incorrect antipyretic administration

Multivariable logistic regression (Table VI) identified lower maternal education, absence of a home thermometer, lack of a family history of febrile seizures, and a history of prematurity as independent predictors of incorrect antipyretic administration. The absence of a home thermometer showed the strongest association with the outcome (aOR 2.74, 95% CI 1.89–3.98), while middle school education or lower remained associated with higher odds compared with university education or higher. A history of prematurity and lack of a family history of febrile seizures were also independently associated with incorrect administration. Maternal age showed a borderline association, whereas child age and sex were not independently associated with the outcome.

Discussion

Despite the availability of international guidelines and educational initiatives on childhood fever, parental misconceptions remain common and continue to influence fever management practices.[15] Consistent with the concept of "fever phobia," originally described by Schmitt[9] and subsequently confirmed in multiple populations, parental anxiety is often driven by fear of severe complications rather than clinical indicators. In this large cohort of 1,000 mothers, maternal knowledge, attitudes, and practices regarding childhood fever were systematically evaluated, allowing direct comparison with existing national and international data.

Although thermometers and antipyretics were widely available in households, substantial misconceptions regarding fever management persisted. Similar to previous studies from Türkiye and other countries, antipyretics were frequently administered to prevent febrile seizures, often with incorrect dosing.[2,8,16] Inconsistent definitions of fever and uncertainty regarding appropriate thresholds

Table VI. Multivariable logistic regression analysis of factors associated with incorrect antipyretic administration

Variable	Adjusted OR	95% CI	p-value
Child age (years)	1.03	0.99–1.07	0.210
Male sex	0.90	0.69–1.18	0.456
Maternal age (years)	0.98	0.95–1.00	0.068
Maternal education			**0.007**
Middle school or lower	1.91	1.24–2.95	**0.003**
High school	1.43	0.92–2.22	0.108
University or higher		Reference	
History of prematurity	1.43	1.04–1.96	**0.030**
No family history of febrile seizures	1.46	1.01–2.12	**0.044**
No thermometer at home	2.74	1.89–3.98	**<0.001**

n values are provided for subgroup categories.
CI: confidence interval; OR: odds ratio.

have been shown to increase reliance on informal information sources, including older family members and social media, rather than professional medical guidance.[6,10] Our findings further support evidence that prior experience with fever management improves adherence to recommended practices, while maternal age influences antipyretic use and perceptions of illness severity[17,18], and maternal age remained independently associated with differences in perceptions and behaviors. Multivariable analysis showed that incorrect antipyretic administration was independently associated with lower maternal education, absence of a home thermometer, absence of a family history of febrile seizures, and prematurity history. Collectively, these results underscore the need for targeted, evidence-based educational interventions addressing persistent knowledge gaps.

Fear of febrile seizures, brain damage, and severe illness represented the most prominent concerns among mothers in this study. Similar levels of anxiety have been reported globally, with systematic reviews demonstrating that exaggerated perceptions of fever-related harm remain widespread among caregivers.[17,19] Preventing febrile seizures and relieving discomfort were the primary motivations for antipyretic use, consistent with earlier reports.[16,18] Common home-based interventions included undressing, sponging, and increased fluid intake.[16] However, despite their widespread use, particularly in developing countries[19], many physical cooling methods lack robust evidence of benefit, and outdated practices such as cold applications or alcohol rubbing continue to be reported.[7]

In the present study, although over half of mothers reported removing their child's clothing, fewer than half used tepid sponging, and nearly 10% applied vinegar, a traditional practice that may provoke rebound fever and is currently discouraged.[20] Tepid sponging refers to wiping with lukewarm water (approximately 32–35 °C), whereas warm sponging uses slightly warmer water aimed primarily at comfort rather than rapid cooling. Randomized trials and comparative studies have demonstrated that tepid sponging does not confer additional benefit over warm sponging or antipyretic therapy alone and may increase discomfort in children.[20,21] These findings highlight a persistent discrepancy between evidence-based recommendations and real-world caregiver practices.

Encouragingly, antibiotic use for fever alone was reported by fewer than 1% of participants, reflecting the effectiveness of national antimicrobial stewardship and rational antibiotic use policies implemented in Türkiye.[2,8] This finding contrasts favorably with earlier reports from regions where inappropriate antibiotic use for febrile illnesses remains prevalent.[12]

Thermometer ownership in our cohort exceeded rates previously reported in both national and international studies[22,23], potentially reflecting improvements in socioeconomic conditions and access to medical devices. Notably, the absence of a home thermometer showed the strongest independent association with incorrect antipyretic administration. Consistent with existing literature, paracetamol remained the most frequently used antipyretic.[6,19,24] The marked decline in acetylsalicylic acid use aligns with safety concerns and public health messaging regarding its association with adverse outcomes.[19] Cultural factors appeared to influence medication administration routes; although suppository use has been reported in up to half of caregivers in earlier studies[3,6], its use was considerably lower in our cohort, particularly among younger mothers.

Alternating antipyretic therapy has not been shown to provide superior clinical benefit compared with monotherapy.[25] In line with this evidence, fewer than one-third of mothers in our study reported alternating paracetamol and ibuprofen, a proportion lower than previously reported in Türkiye.[2,8] This trend may reflect increased awareness of guideline-based recommendations or earlier healthcare consultation as fever severity increases.

Incorrect dosing of antipyretics remains a significant concern.[10] Comparable rates of dosing errors have been reported in previous Turkish cohorts[8], and our findings indicate that nearly one-quarter of mothers either administered incorrect doses or were uncertain about appropriate dosing. Given the well-documented risk of paracetamol toxicity associated with overdosing[13], these findings emphasize the importance of caregiver education regarding weight-based dosing and appropriate administration intervals.[11]

Previous regression-based studies have shown that the factors associated with fever-related outcomes may differ according to the outcome assessed, with some studies emphasizing caregiver characteristics and others highlighting the child's acute clinical condition.[10,24] In our cohort, absence of a family history of febrile seizures and a history of prematurity were associated with a higher likelihood of incorrect antipyretic administration. Although febrile seizure history has been linked to higher caregiver concern in previous work[13], greater familiarity with fever-related events may be associated with more cautious medication use. The association with prematurity may likewise reflect weight-based dosing challenges and the greater care burden of preterm-born children, although this interpretation requires confirmation in future studies. These findings also suggest that the source of information may influence how caregivers manage fever and administer medication at home.

Physicians were identified as the most trusted source of information, consistent with prior studies[26], although older family members and social media continued to play influential roles. While digital platforms can serve as effective tools for disseminating health information, misinformation has been shown to exacerbate parental anxiety and contribute to unsafe practices.[26,27] Structured, physician-guided digital education initiatives may therefore represent an opportunity to improve fever management literacy.

Consistent with previous research[18], nearly half of the participants reported seeking hospital care even for low-grade fever, reflecting anxiety-driven rather than clinically necessary healthcare utilization. Younger mothers expressed greater concern regarding fever-related complications and demonstrated lower adherence to recommended dosing intervals, whereas older mothers exhibited more conservative management strategies, likely reflecting greater experience and confidence.[17]

The association between maternal education and fever management remains controversial.[6] In agreement with earlier studies[18], university-educated mothers in our cohort were less likely to perceive fever as dangerous or to engage in aggressive fever reduction. However, educational attainment alone did not consistently translate into safer medication practices, reinforcing the need for practical, experience-based education rather than knowledge-focused interventions alone.

Key strengths of this study include its large and diverse sample size and the use of in-person surveys administered by pediatricians, minimizing response bias and enabling detailed data collection. By focusing on parents of children without active fever, the influence of acute anxiety on responses was reduced, allowing a more accurate assessment of baseline knowledge and attitudes.

This study has several limitations. Data were based on self-reported maternal practices rather than direct observation. The single-center design may limit generalizability, and selection bias is possible, as participating mothers may have had higher health literacy. The questionnaire was not formally pilot tested before implementation. Additionally, responses to open-ended questions may have been influenced by interviewer bias. The questionnaire was not psychometrically validated (e.g., reliability testing), which may limit measurement precision.

Conclusion

Misconceptions and anxiety-driven behaviors regarding childhood fever remain common among mothers, despite the availability of international guidelines. Consistent with previous studies, fever is frequently perceived as an immediate threat, leading to inappropriate practices such as incorrect antipyretic dosing, inappropriate antipyretic administration, non–evidence-based physical interventions, and unnecessary healthcare utilization for low-grade fever. Fever management behaviors were influenced by maternal age, prior experience, and sources of information, whereas higher educational attainment alone did not consistently translate into safer practices. The low rate of antibiotic use observed suggests that national antimicrobial stewardship efforts have been effective; however, persistent gaps in dosing accuracy and continued reliance on traditional practices underscore the need for targeted, evidence-based caregiver education. Integrating physician-led counseling into routine pediatric care and promoting reliable digital information sources may help reduce parental anxiety and improve home fever management.

Supplementary materials

Supplementary materials for this article are available online at https://doi.org/10.24953/turkjpediatr.2026.6662.

Ethical approval

This study received approval from the Zeynep Kamil Maternity and Children's Training and Research Hospital Ethics Committee (date: 23.02.2022, number: 26). Every participant received assurance regarding the privacy of their information and the voluntary nature of their involvement. All participating mothers were informed of the purpose of the study and provided their verbal consent.

Author contribution

Study conception and design: NUK, KG, ES; Data collection: KG, ÖE, ES; Analysis and interpretation of results: NUK, KG, ÖE; Draft manuscript preparation: NUK, KG, ES. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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