

Why Fever Phobia Is Still Common?

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Abstract

Background: Fever is a reliable sign of illness, but it also evokes fear and anxiety. It is not the fever itself but the fear of possible complications and accompanying symptoms that is important for pediatricians and parents.

Objectives: We aimed to investigate maternal understanding of fever, its potential consequences, and impacts on the treatment of children.

Patients and Methods: A questionnaire was used to explore the attitudes, knowledge, and practices of mothers of 861 children brought to four medical centers in different regions of Turkey in 2012, with fever being the chief complaint. All the children were aged 3 months - 15 years.

Results: Among the 861 mothers, 92.2% favored antipyretics for fever, either alone or in addition to external cooling measures. Most favored paracetamol or ibuprofen. In this study, the appropriate use of antipyretics was 75.2%, which was higher than that reported in the literature. In common with previous reports, seizures and brain damage were perceived as the most frightening and harmful effects of fever. All the mothers expressed concerns about fever, but they were most common among the highly educated or those with one child.

Conclusions: Fever phobia remains common, not only among low socioeconomic status mothers but also among those of high socioeconomic status. Healthcare providers should take fever phobia into account and provide correct information to caregivers about fever at all visits.

Keywords: Fever phobia, Anxiety, Social Class, Antipyretics, Febrile Seizure

1. Background

Fever is a common problem in children, and it is one of the most common complaints for which parents take their children to medical centers. Most febrile episodes are not dangerous and sometimes may even be a beneficial response to an infection. Most of these infections are self-limited viral infections (1-10).

Although fever is a very useful sign of illness, it also evokes fear and anxiety. It is not the fever itself but the possible complications of the fever and accompanying symptoms that give rise to fear (3, 11). Fever phobia is described as unrealistic and exaggerated misconceptions of parents whose children have a fever (2).

Several studies showed that educational levels, socioeconomic status, and cultural backgrounds were the main determinants of knowledge and management of childhood fever (3, 12).

2. Objectives

The aim of this study was to assess maternal understandings of fever and its potential consequences and treatment in children who presented with fever as the chief complaint in various regions of Turkey.

3. Patients and Methods

3.1. Type of Study and Participants

This was a descriptive study conducted between September and December 2012. Four pediatricians administered a questionnaire to the mothers of 861 children who presented with fever as the chief complaint. All the children were aged 3 months - 15 years and presented to four hospitals in different regions of Turkey. The four hospitals in the study were: one private university hospital (n = 408) and one referral and specialized pediatrics teaching hospital (n = 251) in Ankara, the capital of Turkey and two general governmental hospitals in the eastern cities of Batman and Gaziantep (n = 202). Patients who were admitted to the hospital with a chief complaint other than fever and patients who required resuscitation were excluded from the study.

Caregivers other than mothers were not interviewed, as mothers are usually the primary caretakers of children in Turkey. All the mothers matching the inclusion criteria, approved participating in the study. The interview sites were selected from areas with different socioeconomic compositions to include a broad spectrum of society.

3.2. Instruments

The questionnaire was based on a published and validated questionnaire on knowledge, attitudes, and fears about fever in children (3, 8, 13, 14). Face-to-face interviews were conducted, and the participants were asked

open-ended, yes/no, and multiple-choice questions about sociodemographics, factors determining fever, fever intervention techniques, and parental beliefs and attitudes about fever.

Appropriate doses of paracetamol and ibuprofen were considered as 10 - 15 mg/kg/dose and 10 mg/kg/dose, respectively. Physicians made their diagnoses at the end of the medical history, physical examination, and medical workup. The researchers then categorized the preliminary diagnoses as viral and bacterial infections or due to other factors.

3.3. Data Analysis

Data were analyzed using the SPSS Base 16.0 software application. Descriptive statistics are presented as percentages and fractional data. The Kolmogorov-Smirnov test was used to determine data with a normal distribution. The Mann-Whitney U test was used to compare two groups in terms of parental education levels, methods used to determine a fever, temperatures used to define fever, including severe fevers, going to the hospital, and seizures. A P value of < 0.05 was considered significant.

3.4. Ethical Issues

The study was approved by the ethics committee of Fatih University (ID: B302FTH020000/518; 23 February 2012).

The purpose and procedures of the study were explained to the participants, and all participants were assured of the confidentiality of the data and voluntary nature of participation. Informed consent was obtained from each of the participating mothers.

The investigators guaranteed that there were no conflicts of interests.

4. Results

The study included 861 children. The median age of the mothers was 32 years (mean \pm SD: 31.8 \pm 5.9 years), and the median age of the children was 4 years (mean \pm SD: 4.7 \pm 3.2 years). [Table 1](#) presents the characteristics of the parents and children.

In this study, 60% (n = 520) of the mothers used a thermometer at home to measure the child's temperature, and 76% (n = 650) had knowledge of how to measure the temperature. Among the mothers, 70% (n = 600) had a thermometer at home. Almost all (91.5%) had a digital thermometer. The mean temperature measured at home was 38.5 \pm 0.7°C (minimum 35°C, maximum 40°C). The preferred route of measuring the temperature was the axillary site (70%).

Table 1. Sociodemographics of the Parents and Children Surveyed

Variable	No. (%)
Gender of child	
Male	413 (48)
Female	448 (52)
Number of children in the family	
One	264 (30.7)
Two	303 (35.2)
Three or more	294 (34.1)
Child's age, y	
< 3	327 (38)
3 - 6	310 (36)
> 6	224 (26)
Education level of mother	
Illiterate or primary school graduate	430 (50)
High-school graduate	161 (18.5)
Bachelor's degree or higher	270 (31.5)
Education level of father	
Illiterate or primary school graduate	331 (38.5)
High-school graduate	201 (23.3)
Bachelor's degree or higher	329 (38.2)

The perceptions of the mothers regarding the significance of different degrees of temperature elevation are summarized in [Table 2](#).

The mothers were asked about the symptoms that accompanied the fever. According to the responses, 91.8% (n = 789) of the children had a range of symptoms, such as poor appetite, sniffing, and coughing ([Table 3](#)).

The main interventions were antipyretics and tepid sponging, either alone or together. With regard to sponging, the mothers rarely used cold liquids or cologne, vinegar, or alcohol, in combination with antipyretics. Among all 861 cases, only 6.7% (n = 58) were given antibiotics, in addition to antipyretics. The most common antipyretics were oral paracetamol and ibuprofen. Among the mothers that used antipyretics, 75% (n = 592) used an appropriate dose, and 21.4% (n = 170) used less than the required amount. Using more than the required dose was rare. Among the mothers, 41% used alternating antipyretics as an intervention. The interventions used to treat the children's fever are presented in [Table 4](#).

The mothers' beliefs about children with fever, if left untreated, are summarized in [Table 5](#). Among the 861 mothers, 60% believed that seizures were the most frequently encountered complication if fevers were left un-

Table 2. Mothers' Perceptions of the Significance of Different Degrees of Temperature Elevation

Mothers' Perceptions	n	Temperature (°C), Mean ± SD
Temperature measured at home	520	38.5 ± 0.7
Definition of a fever	847	37.6 ± 0.8
Definition of a severe fever	847	38.9 ± 0.7
Temperature believed to warrant a visit to the hospital	844	38.3 ± 1.5
Temperature believed to give rise to seizures	837	39.4 ± 1.5

Table 3. Symptoms Accompanying the Fever

Symptom	No. (%)
Coughing	197 (25)
Sore throat	131 (16.6)
Malaise	118 (15)
Poor appetite	77 (10.1)
Sniffing	64 (8.4)
Other ^a	199 (25.3)
Total	786 (100) ^b

^aOther complains were less than 5% (vomiting, diarrhea, crying, eruption, headache, earache, etc.).

^bMore than one symptom.

treated. Only 1% believed that no complication would occur.

The level of anxiety among the mothers is presented in Table 6, and the association of maternal and paternal education levels with beliefs about temperature elevations are summarized in Table 7.

There was a significant difference between the maternal education level and anxiety level ($P = 0.029$), whereas there was no difference between the paternal education level and anxiety level ($P = 0.336$). When the educational level of the mother was high, the level of anxiety was also high. All the highly educated mothers had thermometers at home, and they knew how to use these. The educational level of the mother did not have an effect on the use of antipyretics ($P = 0.157$).

Mothers who had only one child were more anxious ($P = 0.004$), and they also knew how to measure the temperature ($P = 0.03$). The age of the mother, gender of the child, age of the child, and preliminary diagnosis had no effect on the anxiety level of the mothers ($P > 0.05$).

5. Discussion

This study investigated Turkish mothers' perceptions and knowledge of fever in children and subsequent in-

terventions in different areas of Turkey. Death due to severe illnesses has decreased, access to medical centers is easier than it was in the past, and education levels of society have increased, not only in Turkey but also in other countries; however, fever phobia has persisted through the decades. Most parents have serious concerns about the presence of fever and its possible complications (3, 14-16).

In 1980, Schmitt described fever phobia (2). In that study, brain damage was considered the most frightening and harmful effect of fever. Although concerns about brain damage remain the same (21 - 53%), concerns about seizure have been shown to increase dramatically in this study (2, 3, 8, 13-16). Although research shown that aggressive treatment with antipyretics is not effective in preventing febrile seizures (17), parents may administer antipyretics more frequently in the belief that lowering a child's temperature will prevent febrile seizures. According to the national institute for health and clinical excellence (NICE) guidelines on the treatment of children with fever, the use of antipyretics should be based on specific indications, such as clinical symptoms, the child's age (young), comorbidity, and a high fever (18). The primary goal of treating pediatric fever should be to improve the child's overall level of comfort. There is no evidence that reducing a fever reduces morbidity or mortality of children with a febrile illness (17). In the present study, the mean temperature measured at home was $38.5 \pm 0.7^\circ\text{C}$ (range: $35 - 40^\circ\text{C}$), but 92.2% of mothers in the study administered antipyretics at home. This rate is higher than that reported in other studies (4, 16, 19). We speculate that the higher rate may be explained by the ease and low cost of attending emergency departments in Turkey. Given the high level of parental concern and ease of access to emergency departments, most children with fever are taken to the emergency department.

In the present study, the percentages of mothers who had a thermometer at home, knew how to use it, had a digital thermometer, administered antipyretics, or used antipyretics appropriately were higher than those reported in previous studies in Turkey (13, 14, 19). This may be explained by the higher socioeconomic status of the mothers in this study. In the present study, the mean temperature

Table 4. Therapeutic Interventions Used to Treat the Children's Fevers

Intervention	No. (%)
Removing clothing only	14 (1.6)
Tepid sponging only	14 (1.6)
Antipyretics only	318 (36.9)
Antipyretics and tepid sponging together	325 (37.7)
Antibiotics, in addition to antipyretics	58 (6.7)
Sponging with cold liquids, in addition to antipyretics	71 (8.2)
Rubbing with cologne, vinegar, or alcohol in addition to antipyretics	41 (4.8)
Do nothing, except going to doctor	31 (3.6)
Preferred antipyretics	794 (92.2)
Oral paracetamol	376 (47.2)
Oral ibuprofen	363 (45.5)
Other (aspirin, ketoprofen, CCD, including antipyretics)	32 (4.4)
Do not know	26 (3.3)
Use of antipyretics	794 (92.2)
Appropriate	592 (75.20)
Less than needed	170 (21.4)
More than needed	32 (4.1)
Alternating antipyretics	842 (97.7)
Yes	345 (41)
No	497 (59)
Preferred alternating antipyretics	
Paracetamol + ibuprofen	345 (41)
Paracetamol + ketoprofen	310 (89.6)
Ibuprofen + ketoprofen	11 (3.1)
Others (CCD + antipyretics)	1 (0.3)
Interval between alternating antipyretics	23 (6.9)
4.4 ± 1.4 h (min 2, max 12 h)	
Preferred antibiotics	58 (6.7)
Amoxicillin group	19 (32.8)
Clarithromycin group	16 (27.6)
Cephalosporin group	11 (19)
Do not know	12 (20.7)
Source of antibiotics	58 (6.7)
On hand	32 (55.2)
Going on using	14 (24)
Pharmacy	11 (18.9)
Neighbors	1 (1.7)

Abbreviation: CCD, common cold drugs.

Table 5. Mothers' Beliefs About Untreated Fevers in Children

Beliefs	No. (%)
Seizure	515 (60)
Brain damage	75 (9)
Seizure and brain damage	165 (19)
Death	96 (11)
No effect	10 (1)

Table 6. Level of Maternal Anxiety

Level of Anxiety	No. (%)
None	5 (0.6)
Mild	74 (8.6)
Middle	275 (31.9)
High	507 (58.9)
Total	861 (100)

for the definition of a fever was 37.6°C, which was less than the value defined by mothers with higher levels of education. In the literature, a fever is most commonly reported as 38°C (13, 19), whereas in a study by Wallestein et al., it was mostly less than 38°C (20). The definition of a severe fever was around 39°C, which was the same as that reported in the literature (8). In the current study, 91.8% of the children with fevers had accompanying symptoms. The most frequently reported accompanying symptoms were coughs and sore throats, whereas lethargy was the most common symptom in another study (16). This difference may be due to the various age ranges of the children included in the studies and the fact that health centers are inexpensive to attend and easily accessible in Turkey. As was found in another study (21), many of the mothers used fever as a guide to judge the severity of illness in their children.

In this study, 58.9% of the mothers who completed the questionnaire expressed a high level of anxiety about fever. The level of anxiety was similar to that reported in other countries and cultures (3, 14-16).

In the last two decades, the literature has identified many predictors of parents' concerns about fever in children. These include lack of information about fever management, the presence of moderate fevers, lack of experience of managing febrile conditions, low maternal education levels, young children of young parents, and low socioeconomic status (3, 12, 22).

Interestingly, unlike previous studies (2, 13), this study found that a high level of maternal education and having only one child were predictors of maternal concern. We

Table 7. The Association of Maternal and Paternal Education Levels with Beliefs About Fever Temperatures

Temperature	Less Than High School and Above ^a		P Value ^b
Maternal Education Level			
Temperature used to define fevers	37 (36.5 - 38)	38 (37.5 - 38)	< 0.001
Temperature used to define severe fevers	39 (38 - 39)	39 (38.5 - 39)	0.065
Temperature used to determine going to the hospital	38 (38 - 39)	38.5 (38 - 39)	0.003
Temperature giving rise to fears of seizures	40 (39 - 40)	39.5 (39 - 40)	0.396
Paternal Education Level			
Temperature used to define fevers	37 (36 - 38)	38 (37.4 - 38)	< 0.001
Temperature used to define severe fevers	39 (38.5 - 39)	39 (38 - 39)	0.231
Temperature used to determine going to the hospital	38 (38 - 39)	38.5 (38 - 39)	0.001
Temperature giving rise to fears of seizures	40 (39 - 40)	39.5 (39 - 40)	0.443

^aData are expressed as Median (IQR).

^bMann-Whitney U test.

think that parents with a low education level have insufficient correct information, whereas those with higher education levels have more information but that the information they have about fever is incorrect.

However, the age of the child or the mother, gender of the child, and diagnosis of illness were not considered as predictors. In contrast, in a Canadian study, the authors reported that younger parents with children were more likely to attend medical centers (8).

Maternal knowledge about antipyretics is questionable. In the current study, antipyretics were the mothers' preferred method of managing fevers. Paracetamol and ibuprofen were the most commonly used antipyretics, as reported in other studies (8). In Turkey, the manufacturer-recommended doses listed on the packaging of antipyretic drugs are based on age, not weight. In the present study, 75% of mothers used an appropriate dose of antipyretics, whereas 21% used too low a dose, and 4% used too high a dose. In contrast, recent studies showed that only half of febrile children received an appropriate antipyretic dose (3, 14, 23). In addition, overdosing of antipyretics in the present study was less than the rates reported in the literature (13, 20, 24). Although we found no evidence of intoxication due to overdosing, low dosing of antipyretics was very high. Low dosing may fail to reduce a fever, potentially resulting in the child being taken to the hospital or in a high level of parental anxiety. As noted earlier, access to hospitals is easy and inexpensive in Turkey. Instead of administering high doses of antipyretics, attending a medical center seems to be the preferred behavior.

In this study, 41% of parents alternated antipyretics. Most used paracetamol and ibuprofen, with nearly a 4.4 hours interval between drugs. Alternating antipyretics can

increase the risk of overdosing and overuse of antipyretics. In the literature, rates of 27 - 67% have been reported for alternating antipyretics (3). In the present study, the overdosing was not high, and the interval between the drugs was deemed to be acceptable. Thus, no evidence of intoxication was seen.

External cooling measures (tepid sponging with alcohol, cologne, or vinegar or sponging with cold water, etc.) can lower the body temperature (4, 25). In the present study, half of the mothers used fever-reducing techniques, such as the application of tepid cloths and cold baths, which are no longer recommended by NICE guidelines (18). Rubbing with cologne and vinegar are routinely performed in Turkey and elsewhere (5, 22). As parents are very anxious about fever, techniques for fever reduction, other than the use of antipyretics, were very common in this study.

In the present study, the rate of antibiotic use to reduce fevers was 6.7%, which was higher than that (3.1%) reported by Arica et al. Half of the mothers had antibiotics at home. In Turkey, individuals used to be able to buy antibiotics from pharmacies without a prescription. As a result, many people administered antibiotics like antipyretics. In the present study, the use of nonprescribed antibiotics was lower than expected. The use of antibiotics without a prescription should be hidden for severe infections. Overuse of antibiotics may result in a build-up of antibiotic resistance and have side effects.

Improving the level of parental knowledge of pediatric fever, particularly that of mothers, will prevent both unnecessary treatment and delayed or insufficient responses to fevers.

The strong points of the present study are the inclusion

of participants from different regions and social classes. As such, the study is representative of a broad spectrum of the Turkish population. Furthermore, all the patients in the study underwent an evaluation by a pediatrician and, if necessary, a medical workup to identify the source of the fever.

This study has some limitations. The sample size was too small for generalization of the study results. The implementation of face-to-face questionnaires by the attending pediatrician may increase concerns about fever and may cause bias, such as hiding the truth. Future studies with larger samples and questionnaires implemented by health care workers, other than the attending physician, are needed.

5.1. Conclusion

All the mothers expressed anxiety about fever, especially those with a high level of education and having just one child. Healthcare providers should provide accurate information about fever and fever management at all visits. Pediatricians should focus on the monitoring of signs/symptoms of serious illness, improving the child's comfort by maintaining hydration, and educating parents about the appropriate use, dosage, and safe storage of antipyretics.

References

- Al-Eissa YA, Al-Zamil FA, Al-Sanie AM, Al-Salloum AA, Al-Tuwaijri HM, Al-Abdali NM, et al. Home management of fever in children: rational or ritual?. *Int J Clin Pract*. 2000;**54**(3):138–42. [PubMed: 10829354].
- Betz MG, Grunfeld AF. 'Fever phobia' in the emergency department: a survey of children's caregivers. *Eur J Emerg Med*. 2006;**13**(3):129–33. doi: 10.1097/01.mej.0000194401.15335.c7. [PubMed: 16679875].
- Crocetti M, Moghbeli N, Serwint J. Fever phobia revisited: have parental misconceptions about fever changed in 20 years?. *Pediatrics*. 2001;**107**(6):1241–6. [PubMed: 11389237].
- El-Radhi AS. Why is the evidence not affecting the practice of fever management?. *Arch Dis Child*. 2008;**93**(11):918–20. doi: 10.1136/adc.2008.139949. [PubMed: 18562453].
- Esenay FI, Isler A, Kurugol Z, Conk Z, Koturoglu G. Mothers' approach to feverish child and fever phobia. *Turk Pediatri Arsivi*. 2007;**42**:57–60.
- Fruthaler GJ. Fever in children: phobia vs facts. *Hosp Pract (Off Ed)*. 1985;**20**(11A):49–53. [PubMed: 3934190].
- Hasday JD, Garrison A. Antipyretic therapy in patients with sepsis. *Clin Infect Dis*. 2000;**31** Suppl 5:S234–41. doi: 10.1086/317514. [PubMed: 1113029].
- Karwowska A, Nijssen-Jordan C, Johnson D, Davies HD. Parental and health care provider understanding of childhood fever: a Canadian perspective. *CJEM*. 2002;**4**(6):394–400. [PubMed: 17637156].
- Kluger MJ. Fever revisited. *Pediatrics*. 1992;**90**(6):846–50. [PubMed: 1437423].
- Kohl KS, Marcy SM, Blum M, Connell Jones M, Dagan R, Hansen J, et al. Fever after immunization: current concepts and improved future scientific understanding. *Clin Infect Dis*. 2004;**39**(3):389–94. doi: 10.1086/422454. [PubMed: 15307007].
- Kai J. What worries parents when their preschool children are acutely ill, and why: a qualitative study. *BMJ*. 1996;**313**(7063):983–6. [PubMed: 8892420].
- Leiser D, Doitsch E, Meyer J. Mothers' lay models of the causes and treatment of fever. *Soc Sci Med*. 1996;**43**(3):379–87. [PubMed: 8844939].
- Poirier MP, Collins EP, McGuire E. Fever phobia: a survey of caregivers of children seen in a pediatric emergency department. *Clin Pediatr (Phila)*. 2010;**49**(6):530–4. doi: 10.1177/0009922809355312. [PubMed: 20488812].
- Erkek N, Senel S, Sahin M, Ozgur O, Karacan C. Parents' perspectives to childhood fever: comparison of culturally diverse populations. *J Paediatr Child Health*. 2010;**46**(10):583–7. doi: 10.1111/j.1440-1754.2010.01795.x. [PubMed: 20626582].
- National Public Health Agency . National Antimicrobial Resistance Surveillance System. Report of the First Proficiency. Ankara: Department of the Refik Saydam; 2011.
- Nijman RG, Oostenbrink R, Dons EM, Bouwhuis CB, Moll HA. Parental fever attitude and management: influence of parental ethnicity and child's age. *Pediatr Emerg Care*. 2010;**26**(5):339–42. doi: 10.1097/PEC.0b013e318dbdce. [PubMed: 20404784].
- Sullivan JE, Farrar HC. Section on Clinical Pharmacology and Therapeutics; Committee on Drugs, Fever and antipyretic use in children. *Pediatrics*. 2011;**127**:580–7.
- National Institute for Health and Clinical Excellence . Feverish illness: assessment and initial management in children younger than 5 years London: National Institute for Health and Clinical Excellence; 2007. Available from: www.nice.org.uk/CG047.
- Enarson MC, Ali S, Vandermeer B, Wright RB, Klassen TP, Spiers JA. Beliefs and expectations of Canadian parents who bring febrile children for medical care. *Pediatrics*. 2012;**130**(4):905–12. doi: 10.1542/peds.2011-2140. [PubMed: 22966028].
- Wallenstein MB, Schroeder AR, Hole MK, Ryan C, Fijalkowski N, Alvarez E, et al. Fever literacy and fever phobia. *Clin Pediatr (Phila)*. 2013;**52**(3):254–9. doi: 10.1177/0009922812472252. [PubMed: 23349363].
- Lagerlov P, Loeb M, Slettevoll J, Lingjaerde OC, Fetveit A. Severity of illness and the use of paracetamol in febrile preschool children; a case simulation study of parents' assessments. *Fam Pract*. 2006;**23**(6):618–23. doi: 10.1093/fampra/cml046. [PubMed: 17035288].
- Impicciatore P, Nannini S, Pandolfini C, Bonati M. Mother's knowledge of, attitudes toward, and management of fever in preschool children in Italy. *Prev Med*. 1998;**27**(2):268–73. doi: 10.1006/jpmed.1998.0262. [PubMed: 9579006].
- Goldman RD, Scolnik D. Underdosing of acetaminophen by parents and emergency department utilization. *Pediatr Emerg Care*. 2004;**20**(2):89–93. [PubMed: 14758305].
- Li SF, Lacher B, Crain EF. Acetaminophen and ibuprofen dosing by parents. *Pediatr Emerg Care*. 2000;**16**(6):394–7. [PubMed: 11138879].
- Greisman LA, Mackowiak PA. Fever: beneficial and detrimental effects of antipyretics. *Curr Opin Infect Dis*. 2002;**15**(3):241–5. [PubMed: 12015457].