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 ± SD: 31.8 ± 5.9 years), and the median age of the children was 4 years (mean ± SD: 4.7 ± 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 ± 0.7°C (minimum 35°C, maximum 40°C). The preferred route of measuring the temperature was the axillary site (70%).

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 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) |
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*             | 199 (25.3) |
| Total              | 786 (100) |

*Other complaints were less than 5% (vomiting, diarrhea, crying, eruption, headache, earache, etc.).

A more 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 interventions 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, 14-46).

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 ± 0.7°C (range: 35-40°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...
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).

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 Used | Maternal Education Level | P Value<sup>b</sup> | Paternal Education Level | P Value<sup>b</sup> |
|------------------|--------------------------|----------------------|--------------------------|----------------------|
| Temperature used to define fevers | 37 (36.5 - 38) | 38 (37.5 - 38) | < 0.001 | 37 (36 - 38) | 38 (37.4 - 38) | < 0.001 |
| Temperature used to define severe fevers | 39 (38 - 39) | 39 (38.5 - 39) | 0.065 | 39 (38.5 - 39) | 39 (38 - 39) | 0.231 |
| Temperature used to determine going to the hospital | 38 (38 - 39) | 38.5 (38 - 39) | 0.003 | 38 (38 - 39) | 38.5 (38 - 39) | 0.001 |
| Temperature giving rise to fears of seizures | 40 (39 - 40) | 39.5 (39 - 40) | 0.396 | 40 (39 - 40) | 39.5 (39 - 40) | 0.443 |

<sup>a</sup>Data are expressed as Median (IQR).
<sup>b</sup>Mann-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, the over-dosing was not high, and the interval between the drugs was deemed to be acceptable. Thus, no evidence of intoxication was seen.

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.

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