



# Determination of Factors Affecting Fever Management of Parents Who Bring Their Children to the Emergency Department with High Fever

## Çocuklarını Yüksek Ateş ile Acile Getiren Ebeveynlerin Ateş Yönetimini Etkileyen Faktörlerin Belirlenmesi

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### Abstract

**Introduction:** This study was conducted to determine the factors affecting fever management of parents who bring their children to the emergency room with high fever.

**Methods:** This descriptive study was conducted with the parents of children aged 6 months to 5 years who presented to the pediatric emergency department of a state hospital in the southeastern region of our country with complaints of high fever. Data for the study were collected using the "descriptive characteristics form" prepared by the researcher and the "parent fever management scale". In the evaluation of the data, percentages, means, standard deviations, The study was completed with the participation of 252 parents. Percentage, mean, standard deviation, Kruskal-Wallis, Mann-Whitney U, ANOVA, t-test, and post hoc Scheffe and Jonckheere-Terpstra tests, which are advanced analysis techniques, were used in the evaluation of the data.

**Results:** As a result of the analysis, the average score of the participants on the parental fever management scale was calculated as 31.43±4.50. It was determined that parental fever management was influenced by factors such as the educational level of the mother and father, economic status, and place of residence.

**Conclusion:** Considering the minimum and maximum scores that can be obtained from the parent fever management scale, it can be stated that parents' fever management is above average.

**Keywords:** High fever, fever management, emergency, parent

### Öz

**Giriş:** Bu çalışma çocuklarını yüksek ateş ile acile getiren ebeveynlerin ateş yönetimini etkileyen faktörlerin belirlenmesi amacıyla yapılmıştır.

**Yöntemler:** Tanımlayıcı türde yapılan bu çalışma ülkemizin güneydoğusundaki bir devlet hastanesinin çocuk acil servisine yüksek ateş şikayeti ile başvuran 6 ay-5 yaş aralığındaki çocukların ebeveynleri ile yürütülmüştür. Çalışmanın verileri araştırmacı tarafından hazırlanan "tanıtıcı özellikler formu" ve "ebeveyn ateş yönetimi ölçeği" kullanılarak toplanmıştır. Çalışma 252 ebeveynin katılımı ile tamamlanmıştır. Verilerin değerlendirilmesinde yüzde, ortalama, standart sapma, Kruskal-Wallis, Mann-Whitney U, ANOVA, t-testi, ileri analiz tekniklerinden olan post hoc Scheffe ve Jonckheere-Terpstra testleri kullanılmıştır.

**Bulgular:** Yapılan analizler sonucunda katılımcıların ebeveyn ateş yönetimi ölçeği puan ortalamaları 31,43±4,50 olarak hesaplanmıştır. Ebeveyn ateş yönetiminin anne ve baba eğitim durumu, ekonomik durum, yaşanan yer gibi faktörlerden etkilendiği belirlenmiştir.

**Sonuç:** Ebeveyn ateş yönetimi ölçeğinden alınabilecek en az ve en çok puanlar göz önünde bulundurulduğunda ebeveynlerin ateş yönetimlerinin ortalamanın üstünde olduğu söylenebilir.

**Anahtar Kelimeler:** Yüksek ateş, ateş yönetimi, acil, ebeveyn

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## Introduction

Fever, defined as a body temperature of  $\geq 37.5$  °C,<sup>1</sup> is not a disease but one of the body's important defense mechanisms.<sup>2</sup> Factors such as viral or bacterial infections, tissue damage and edema play a role in the etiology of fever, which can occur as a symptom of any disease.<sup>2,3</sup> The possibility that fever, which is usually self-limiting,<sup>1</sup> may cause seizures/convulsions, brain damage or physical damage in the child causes parents to worry.<sup>4</sup> Fever is one of the most common reasons for emergency admission in children.<sup>3</sup> It is thought that this may be due to the feeling of anxiety that fever creates in parents. In one study, it was found that the majority of the families participating in the study were afraid of their children's having fever, believed that fever was harmful and thought that fever could cause their children to have seizures.<sup>5</sup> In a study conducted in Türkiye, it was found that the majority of parents were overly anxious when their children had fever and were afraid that their children would have convulsions.<sup>6</sup> In a nationwide study conducted in Australia to examine parents' knowledge, beliefs and management of fever, it was found that parents thought that fever had harmful effects such as seizures, dehydration, serious illness and brain damage.<sup>7</sup> Parents' feelings of fear and anxiety related to fever and their knowledge or thoughts about the harms of fever may affect their management of fever. At the same time, the belief that fever may cause seizures, brain and physical damage may cause parents to experience anxiety and panic.<sup>4</sup> This state of anxiety and panic may cause parents to resort to wrong practices to reduce fever. In the literature, it has been reported that when children have fever, some parents apply warm shower, remove the child's clothes, and give antipyretics, while others use methods such as vinegar water, alcohol, and cologne.<sup>5,8</sup> In order to prevent parents from resorting to wrong practices related to fever management, it is important to investigate and reveal the factors affecting fever management and then inform parents about the identified factors. This study was conducted as a descriptive study to determine the factors affecting the fever management of parents who brought their children to the emergency room with high fever.

## Materials and Methods

### Aim and Type of the Study

This study was conducted as a descriptive study to "determine the factors affecting the fever management of parents who brought their children to the emergency room with high fever".

### Population and Sampling of the Study

The data of the study were collected between March and June 2024. The population of the study consisted of parents (mother or father) of children between the ages of 6 months and 5 years who presented to the pediatric emergency department of a state hospital in the southeast of Türkiye with the complaint of high fever. The number of individuals to be included in the sample was calculated using the A-priori Sample Size Calculator for Multiple Regression program (alpha level 0.05, effect size 0.15, number of variables 13 and desired statistical power level 0.95) and it was determined that at least 190 individuals should be reached as a result of the calculation.<sup>9</sup> The study was completed with the participation of a total of 252 parents (mother or father).

Inclusion criteria were as follows: Parents who had a child between the ages of 6 months and 5 years, who brought their child to the emergency room with the complaint of high fever, who could read and write and who agreed to participate in the study were included in the study.

### Data Collection Tools

The data of the study were collected in the pediatric emergency department of a state hospital in the southeast of Türkiye between March and June 2024 by the researchers conducting the study. The data were collected with face-to-face interview method using the "Descriptive Characteristics Form" and "Parent Fever Management Scale" prepared by the researchers. It took an average of 10-15 minutes to complete these forms.

**Descriptive Characteristics Form:** This form, prepared by the researcher, consists of 14 items about the socio-demographic characteristics of the participants.

**Parent Fever Management Scale (PFMS):** This scale, which aims to measure parents' practices related to the management of childhood fever, was developed by Walsh et al. in 2008. The Turkish validity and reliability study of the scale was conducted by Cinar et al.<sup>10</sup> in 2014. The scale consists of a total of eight items and is a five-point Likert-type scale. The minimum score is 8 and the maximum score is 40. As the score obtained from the scale increases, parents' fever management increases positively. In the validity and reliability study of the scale, Cronbach alpha value was calculated as 0.79.<sup>10</sup> In this study, Cronbach alpha value was found as 0.81.

### Ethical Dimension of the Study

Before starting the study, the necessary permission were obtained from the Harran University Clinical Research Ethics Committee (decision no: HRU/24.02.30, date: 18.03.2024).

After the purpose of the study was explained to the participants, written and verbal consent was obtained from the participants who agreed to participate in the study. The study was conducted in accordance with the Declaration of Helsinki.

### Statistical Analysis

After the data of the study were uploaded to the SPSS program, the necessary analyses were performed. Percentage, mean, standard deviation, Kruskal Wallis, Mann-Whitney U, One-Way ANOVA, t-test, post hoc Scheffe and Jonckheere-Terpstra tests, which are advanced analysis tests, were used in the evaluation of the data. Statistical significance level was accepted as  $p < 0.05$ .

### Results

Table 1 shows the sociodemographic characteristics of the participants. The mean age of the children of the participants was calculated as  $27.80 \pm 14.61$  (months). It was determined that the gender of the majority of the participants' children was female (52.2%), the degree of closeness was mother (58.3%), the mother's educational status was primary or secondary school (42.9%), and the father's educational status was high school (44.4%). It was determined that the majority of the parents' incomes were equal to their expenses (52.0%), they noticed when their child had fever by touching (42.1%), their children had not had febrile illnesses before (75.4%), their children had not had convulsions before (77.0%), their children did not have any chronic diseases (85.3%), and they were afraid of their children having convulsions when they had fever (54.4%). It was also found that the majority of the parents usually applied to the emergency unit between 16.00-24.00 hours when their child had fever (41.2%) and applied to the emergency room 2-6 hours after the child had fever (25.4%) (Table 1).

Table 1. Socio-demographic features		
	Number (n)	Percentage (%)
<b>Mean age of children (month)</b>	27.80±14.61	
<b>Gender of child</b>		
Girl	131	52.0
Boy	121	48.0
<b>Degree of affinity with child</b>		
Mother	147	58.3
Father	105	41.7
<b>Educational status of mother</b>		
Primary or secondary school graduate	108	42.9
High school graduate	106	42.1
University graduate	38	15.1

Table 1. Continued		
	Number (n)	Percentage (%)
<b>Educational status of father</b>		
Primary or secondary school graduate	76	30.2
High school graduate	112	44.4
University graduate	64	25.4
<b>Economical status</b>		
Income less than expense	68	27.0
Income equal to expense	131	52.0
Income more than expense	53	21.0
<b>Place of residence</b>		
Rural area	88	34.9
Urban area	164	65.1
<b>Way of recognizing when the child has a fever</b>		
By touching	106	42.1
By assessing general appearance (weakness, fatigue, etc.)	96	38.1
By taking temperature with a thermometer	50	19.8
<b>The child's previous history of febrile illness</b>		
Yes	62	24.6
No	190	75.4
<b>The child's previous history of seizures</b>		
Yes	58	23.0
No	194	77.0
<b>The child's having a chronic disease</b>		
Yes	36	14.3
No	216	85.3
<b>The most feared situation when the child has a fever</b>		
High fever doesn't scare me	6	2.4
<b>Development of permanent brain damage</b>	49	19.4
Convulsion	137	54.4
Loss of life	51	20.2
Other	9	3.8
<b>Time of admission to the emergency unit</b>		
8.00-16.00	74	29.4
16.00-24.00	104	41.2
24.00-08.00	74	29.4
<b>Duration of emergency service admission after fever</b>		
We came to the emergency room as soon as the fever broke	39	15.5
1 hour later	52	20.6
2-6 hours later	64	25.4
7-12 hours later	52	20.6
13-24 hours later or more	45	17.9

When the status of the participants according to the PFMS was evaluated, it was found that 47.2% of the parents mostly measured the child's temperature when the child had a fever, 52.4% mostly wanted to know what the child's temperature was, 41.3% mostly wanted to make sure that the child had plenty of fluids, 54.8% mostly used antipyretics, 53.6% mostly checked the child's fever during the night, 42.1% mostly and 41.3% always slept in the same room with the child when the child had fever, 29.8% sometimes and 29.8% mostly woke the child at night to give antipyretics, and 51.6% mostly took the child to the doctor (Table 2).

Table 3 shows the fever management scale scores of the parents and the mean score of the parents on the PFMS was calculated as 31.43±4.50.

The comparison of the socio-demographic characteristics of the parents and the mean scores of the PFMS is shown in Table 4. It was determined that there was a statistically significant difference between mother's and father's education levels

and PFMS, and the mean PFMS scores of those whose mother and father's education level was university and above were significantly higher ( $p \leq 0.001$ ). In addition, it was found that there was a statistically significant difference between the economic status of the parents and the places where they lived and the mean scores of the parents whose incomes were higher than their expenses ( $p \leq 0.001$ ) and who lived in urban areas ( $p = 0.003$ ) were significantly higher. It was determined that there was no significant difference between the PFMS and the gender of the child, the status of being the mother or father of the child, the methods of recognizing that the child had a fever, the child's previous febrile illnesses and convulsions and the presence of chronic diseases, the situation that the child was most afraid of when the child had a fever, the time of admission to the emergency unit and the time period from the onset of the child's fever to the application to the emergency service (Table 4).

**Table 2. Parents' practices according to the parent fever management scale**

	Never (%)	Rarely (%)	Sometimes (%)	Usually (%)	Always (%)	Mean ± SD
1. I take his/her temperature	0.4	4.8	24.2	47.2	23.4	3.88±0.83
2. I would like to know his/her temperature	0.0	2.8	17.5	52.4	27.4	4.04±0.74
3. I want to make sure he/she drinks plenty of fluids	0.4	9.1	25.0	41.3	24.2	3.79±0.92
4. I give him/her antipyretics	1.2	9.1	18.3	54.8	16.7	3.76±0.87
5. I check him/her during the night	0.0	3.6	11.5	53.6	31.3	4.12±0.74
6. I sleep in the same room with him/her	0.8	4.8	11.1	42.1	41.3	4.18±0.86
7. I wake him/her up to give antipyretics	2.4	19.0	29.8	29.8	19.0	3.44±1.07
8. I take him/her to the doctor	0.0	1.6	12.3	51.6	34.5	4.19±0.70

SD: Standard deviation

**Table 3. Mean score for the parent fever management scale**

Scale	Mean ± SD	Median (Min-max)
PFMS	31.43±4.50	32.00 (15.00-40.00)

PFMS: Parent fever management scale, SD: Standard deviation, Min-max: Minimum-maximum

**Table 4. Socio-demographic features and parent fever management scale**

	n	PFMS Mean±SD	Test
<b>Gender of child</b>			
Girl	131	31.40±4.63	U=7804.500 p=0.834
Boy	121	31.46±4.38	
<b>Degree of affinity with child</b>			
Mother	147	31.52±4.69	U=7515.000 p=0.722
Father	105	31.30±4.25	
<b>Educational status of mother</b>			
Primary or secondary school graduate	108	30.24±4.53	F=10.846 <b>p≤0.001*</b> c>a=b
High school graduate	106	31.73±4.17	
University graduate	38	33.97±4.21	

Table 4. Continued

	n	PFMS Mean±SD	Test
<b>Educational status of father</b>			
Primary or secondary school graduate	76	30.14±4.85	F=8.478 <b>p≤0.001*</b> c>a=b
High school graduate	112	31.30±4.13	
University graduate	64	33.18±4.18	
<b>Economical status</b>			
Income less than expense	68	29.95±4.86	KW=16.159 <b>p≤0.001**</b> a<b<c
Income equal to expense	131	31.38±4.17	
Income more than expense	53	33.45±4.10	
<b>Place of residence</b>			
Rural area	88	29.97±4.69	U=5560.500 <b>p=0.003</b>
Urban area	164	32.21±4.21	
<b>Way of recognizing when the child has a fever</b>			
By touching	106	31.34±4.63	F=2.892 p=0.057
By assessing general appearance (weakness, fatigue, etc.)	96	30.85±4.11	
By taking temperature with a thermometer	50	32.72±4.76	
<b>The child's previous history of febrile illness</b>			
Yes	62	30.50±5.67	t=-1.590 p=0.116
No	190	31.73±4.02	
<b>The child's previous history of seizures</b>			
Yes	58	30.67±6.00	t=-1.178 p=0.243
No	194	31.65±3.94	
<b>The child's having a chronic disease</b>			
Yes	36	31.38±5.12	t=-0.063 p=0.950
No	216	31.43±4.40	

\*: Post Hoc-Scheffe, \*\*: Jonckheere-Terpstra test, PFMS: Parent fever management scale, SD: Standard deviation, KW: Kruskal-Wallis, U: Mann-Whitney U, F: ANOVA

## Discussion

The approach of parents is very important in the management of fever<sup>3</sup>, which is one of the most common causes of emergency admission in childhood. For this reason, it is important to determine the knowledge and attitudes of parents about fever management and to correct any mistakes with trainings in terms of child health and then public health. In our study in which we examined the factors affecting the fever management of the parents of children admitted to the emergency department with the complaint of high fever, it was determined that the majority of the parents knew that their child had fever by touching the child and they were afraid that their children would have convulsions when they had fever. In some studies, conducted in Türkiye, similar to our findings, it was found that the majority of parents recognized that their child had fever by touching the child and that they were most afraid of their child having convulsions.<sup>6,11,12</sup> In a study conducted in Malaysia, it was reported that very few parents recognized that their child had fever by touching the child.<sup>13</sup> It

is thought that this difference in the literature may be due to cultural and economic factors between countries. Detection of fever by parents by touching may lead to inaccurate detection of fever and thus delays in early intervention for fever. Failure to intervene early in fever will lead to the development of convulsions, which is an important complication of fever and a condition that parents fear. Therefore, it is recommended that practices or trainings should be planned to increase the level of knowledge of parents about fever management. In addition, in our study, it was found that the majority of parents usually applied to the emergency room between 16.00 and 24.00 when their children had fever and applied to the emergency room approximately 2-6 hours after the child's fever broke out. It is thought that the reason why they applied to the emergency room between 16.00 and 24.00 is due to the fact that outpatient clinics are closed after working hours. It is thought that when the child's fever first broke out, the parents tried to reduce the fever at home with their own means, so they applied to the emergency room approximately 2-6 hours later. In a study, it was determined that the majority

of parents applied to the emergency room if the child's fever did not decrease for a day.<sup>16</sup> When the studies examining the fever management of parents were examined, it was found that the mean scale scores of the fever management method of the parents ranged between 33.71±3.40 and 36.22±3.46.<sup>8,14-16</sup> In this study, the mean score of the parents in the PFMS was calculated as 31.43±4.50. Based on the minimum and maximum mean scores that can be obtained from the scale, it is seen that the mean scores of the parents are above the average.

In our study, when the mean PFMS scores of the parents according to the socio-demographic characteristics of the parents were compared, it was determined that there was a significant difference between maternal and paternal education levels and PFMS, and the mean PFMS scores of the parents with university and higher education level were significantly higher. When the literature was examined, similar to our study findings, studies indicating a relationship between parental education level and parental fever management were found.<sup>14,17,18</sup> In these studies, it was determined that as the level of education increased, the fever management of parents increased positively. It is thought that the possibility that parents' reading and research potential or awareness on health may have increased as their educational level increased, which might be the reason for this difference. In the literature, unlike our findings, there are also studies in which it was determined that there was no relationship between parental education level and parental fever management.<sup>2,8</sup> In our study, it was also found that there was a statistical difference between the economic status of the parents and the places where they lived and PFMS scores, and that the mean PFMS scores of parents whose incomes were higher than their expenses and who lived in urban areas were higher. The fact that parents have higher income levels or live in urban areas may facilitate their access to accurate information about childcare. Therefore, it is thought that the mean fever management scores of parents having higher income levels and living in urban areas may be higher. Similar to our findings, Yiğit and Sarılioğlu<sup>14</sup> found that parents whose income was higher than expenses and who lived in urban areas had higher mean fever management scores. Higher mean fever management scores were reported for parents living in urban areas by Yazıcı and Kutlu<sup>17</sup> and for parents whose income was higher than expense by Kayhanlar Gulcan and Canbulat Sahiner.<sup>18</sup> In our study, it was determined that there was no significant difference between the gender of the child, the status of being the mother or father of the child, the methods of recognizing that the child had fever, the child's previous febrile illness and convulsions, and the presence of chronic disease and the PFMS. When the literature was examined, similar to our findings, it was found that some studies stated

that there was no relationship between the gender of the child,<sup>8,14</sup> being a mother or father,<sup>14</sup> having a chronic disease<sup>8</sup> and parental fever management. In contrast to this study, Ekim and Üstünel<sup>2</sup> found that the mean fever management scores of parents whose children did not have a history of previous febrile illness were higher.

### Study Limitations

The limitation of this study is that it was conducted in a single center and only with the parents of children who were admitted to the emergency unit.

### Conclusion

If fever, which is an important symptom of childhood diseases, is not treated correctly, many complications may occur. For this reason, it is important that parents, who are with the child at every moment, have the right information about fever and can make the right interventions in case of fever. The first step to be taken in this regard is to determine the status of parents regarding fever management and then to eliminate the problems identified. In our study, it was determined that fever management was at a better level for parents who were university graduates, whose income was higher than their expenses and who lived in urban areas. It is thought that this difference is due to the fact that parents living in urban areas have more opportunities to obtain information, and individuals whose income is more than their expenses and who are university graduates have a higher awareness of accessing correct information. In this direction, it is recommended that all parents, especially parents living in rural areas and parents with low educational and economic levels, should be given training on fever management.

### Ethics

**Ethics Committee Approval:** Before starting the study, the necessary permission were obtained from the Harran University Clinical Research Ethics Committee (decision no: HRU/24.02.30, date: 18.03.2024).

**Informed Consent:** After the purpose of the study was explained to the participants, written and verbal consent was obtained from the participants who agreed to participate in the study.

### Footnotes

#### Authorship Contributions

Concept: M.Y., H.Y.S.A., A.K., B.G., Design: M.Y., H.Y.S.A., Data Collection or Processing: A.K., B.G., Analysis or Interpretation: M.Y., Literature Search: M.Y., H.Y.S.A., Writing: M.Y.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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