

ORIGINAL ARTICLE

Comparing Fever Management by Mothers of Children Aged 1–5 and 6–10 YearsBURCU KORKUT¹, PINAR KALEM², ELIF MUSELLIM³, HABIBE İNCİ⁴, ERKAN DOĞAN⁵, DIDEM ADAHAN⁶¹Assistant Professor MD, Department of Family Medicine, Karabük University Faculty of Medicine, Karabük, TURKEY²Assistant Professor MD, Department of Family Medicine, Karabük University Faculty of Medicine, Karabük, TURKEY³MD, Department of Family Medicine, Karabük University Faculty of Medicine, Karabük, TURKEY⁴Assistant Professor MD, Department of Family Medicine, Karabük University Faculty of Medicine, Karabük, TURKEY⁵Assistant Professor MD, Department of Pediatrics, Karabük University Faculty of Medicine, Karabük, TURKEY⁶Professor MD, Department of Family Medicine, Karabük University Faculty of Medicine, Karabük, TURKEYCorresponding author: Burcu Korkut, Email: burcukorkut@karabuk.edu.tr, Cell: 00905370631627; ORCID:0000-0002-0296-9144**ABSTRACT****Background/Aim:** This study aimed to compare the fever management by mothers of children aged 1-5 and 6-10 years admitted with fever.**Methods:** This cross-sectional and descriptive study was conducted between November 2021 and March 2022 at Karabük University Department of Pediatrics and Karabük City Family Health Centers. To work, 710 mothers with febrile children between 1-5 and 6-10 participated. Due to 58 invalid questionnaires, 652 mothers formed the study population. All mothers were included in the study without sample selection. A questionnaire consisting of 3 parts and 33 questions was applied to the participants face-to-face. Questions; It consisted of the first sociodemographic part such as age, gender, mother's education level, the second part measuring the knowledge, attitudes, and behaviors of mothers about fever symptoms, and the third part consisting of the Turkish Version of the Parental Fever Management Scale (PFMS-TR).**Results:** Mothers of 332 children between the ages of 1-and 5 and 324 children between the ages of 6-and 10 participated in the study. The rate of girls between the ages of 1-and 5 was 57.8% (n=192), and the rate of girls between the ages of 6-and 10 was 49.4% (n=160). There was no significant difference between the two participant groups regarding PFMS-TR (p=0.198). In those who applied to the hospital with the complaint of fever (p=0.004), who received training from health professionals about what to do in case of fever in their child (p=0.001), understanding that their child has a fever from body temperature or skin contact (p=0.001), applying to a health institution in the presence of fever (p=0.001), determining body temperature requiring antipyretic (p<0.001) and administering antipyretic drugs according to doctor's prescription (p<0.001) a statistically significant difference was found between the mothers of two groups of children with fever.**Conclusion:** It was determined that there was no difference between the mothers' fever-related anxiety and phobia levels in both groups. This situation, regardless of the age group in which the fever symptom occurs, can be explained by the parents' anxiety. So, it is essential to carry out education programs to inform mothers about fever management accurately and adequately to reduce the level of anxiety they experience.**Keywords:** Anxiety, Body Temperature, Child, Health Knowledge Attitudes Practice, Parents, Phobia.**INTRODUCTION**

Fever is usually an indicator of harmless and self-limiting viral infections [1]. In some cases, it responds to a severe bacterial infection that requires prompt and appropriate medical treatment. It is a significant symptom that can indicate various issues depending on the child's age [2]. In some rare cases, body temperature exceeds 41.1°C; a body temperature reaching or exceeding 42°C is life-threatening and can cause neurological damage [3]. The most common complications of high fever in children are febrile convulsion, heart failure, and dehydration [4].

It has been reported that parents and medical staff frequently take an erroneous approach to managing fever in children, and malpractices in treating high fever in children can lead to various complications, including death. Hence, in cases of high fever, taking the necessary precautions and ensuring timely intervention are critical [5]. In the event of a fever, parents who are unaware of or have inaccurate information about managing high fever in their children may experience severe anxiety. Moreover, fever phobia can develop in parents concerned about the negative consequences of high fever [6].

Therefore, it is crucial to investigate the parents' current knowledge and attitudes toward fever, identify their needs, and organize healthcare-related training based on the information collected accordingly [7]. Training parents is the only way to ensure that they are aware of the need for and importance of immediate intervention in the event of a high fever in their children and the consequences of fever that can be avoided with the appropriate interventions. Primarily, mothers' current level of awareness regarding high fever should be determined to conduct such training [8]. Moreover, to ensure that parents appropriately intervene in a high fever, it is crucial to determine the level of anxiety that parents of children with high fever experience because of sudden fear and consequently prevent this anxiety [6].

This study aimed to compare the fever management approaches and fever-related concerns of mothers whose children were admitted to healthcare facilities for fever and compare them to their children's age groups.

MATERIALS AND METHODS

The present prospective cross-sectional study was conducted in the Pediatric Clinic of Karabük University and Family Health Centers in Karabük Province between December 2021 and April 2022. Seven hundred ten mothers who thought that their child aged 1-10 had symptoms of fever participated in the study. However, 58 mothers were excluded because they filled out the questionnaire incorrectly or incompletely, and the study was completed with 652 participants. Children were divided into groups 1-5 and 6-10 years old, based on the age at which febrile convulsions are common. Mothers of children with fever, except for the 1-10 age group, were excluded from the study.

Written consent was obtained from the participants before the study. Face-to-face survey method was used in the study. Questionnaire consisted of 3 parts and 33 questions. The first part of the questionnaire consisted of 14 sociodemographic questions about the number of children divided into two groups, their gender, education and employment status of mothers, family members, and the number of children. The second part included 11 questions evaluating parents' knowledge, attitudes, and behaviors towards fever. The Turkish version of the Parental Fever Management Scale (PFMS-TR), consisting of 8 questions, took place in the third part. The purpose of the scale: This study aimed to evaluate parents' anxiety levels when their children are feverish and to measure their fever phobias.

Parental Fever Management Scale Walsh et al. Written by [9]. The Turkish validity and reliability study of the scale was performed by Çınar et al. has done [10]. The scale is in the form of

a 5-point Likert. Always" is given 5 points, "Never" is given 1 point. The lowest score on the scale is 8, and the highest is 40. As the scores obtained from the scale increase, the anxiety and fever phobia of parents whose children have fever also increase. The Cronbach's alpha value of the scale is 0.80. The data were evaluated in a computer environment using the IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp. program. When summarizing the data, the descriptive statistics for continuous variables were tabulated as mean ± standard deviation or median and interquartile 25%-75%, depending on the distribution. The categorical variables were summarized as numbers and percentages. To statistically analyze the quantitative data, Kolmogorov-Smirnov tests were used to assess the normality of their distribution. The data obtained via the scales were tested using the independent t-test and the one-way analysis of variance. A p-value of <0.05 was considered statistically significant for all analysis methods used in the study.

The approval of Karabük University Non-Interventional Clinical Research Ethics Committee (Decision No: 2021/716; Number: E-77192459-050.99-81103) was obtained for the study. This study was conducted in accordance with the Declaration of Helsinki.

RESULTS

Among 332 children aged 1-5 years, 57.8% were girls, and 49.4% of 324 children aged 6-10 years were girls. There was a significant difference between the two age groups in terms of gender (p = 0.03). 81.9% of children aged 1-5 years and 75.3% of children aged 6-10 years are children of a nuclear family, and a significant difference was established between them (p = 0.039). The first child with fever was most likely in 1-5 years (P < 0.001) (Table 1).

The number of children aged 6-10 years who presented to the hospital or doctor with fever was significantly higher than the other group (p = 0.004). There was no difference between the two groups regarding child body temperature control and fever training (p = 0.480, p = 0.79, respectively). It was determined that 67.4% of mothers with children aged 1-5 years and 77.8% of mothers aged 6-10 years received information about fever from healthcare professionals. There was a significant difference between the two groups (P <0.001). "Are you worried about your child's fever?" The number of 'yes' respondents to the question was significantly lower in the 1-5 year age group (P < 0.001). When the children had a fever, there was no difference between the groups regarding response to the most worrying causes (p = 0.185). "How do you know that a child's body temperature has risen?" The number of people who answered 'if the child's body is warmer than usual' was significantly lower in the 1-5 year age group (p < 0.001). What do you do first when your child has a fever? The number of

respondents to the question "I am applying to a health institution" was significantly higher in the age group 1-5 years (P < 0.001). What is the body temperature that requires antipyretic? The number of respondents to questions 37-37.9 was significantly higher in the 6-10 age group (P < 0.001). "How do you choose the disinfectant to give your child?" The number of respondents to the question 'on prescription' was significantly higher in the age group of 6-10 years (P < 0.001). There was no significant difference between the two groups who answered the 'ask the doctor' questions 'what would you do if the fever persists' (p = 0.155) (Table 2).

Table 1: Sociodemographic characteristics of mothers as well as children aged 1–5 or 6–10 years

	1–5 years		6–10 years		p*
	n	%	n	%	
	332		324		
Gender					
Girl	192	%57.8	160	%49.4	0.030*
Boy	140	%42.2	164	%50.6	
Maternal Education					
Elementary school	36	%10.8	64	%19.8	0.145
Secondary school	72	%21.7	60	%18.5	
High school	96	%28.9	68	%21.0	
Higher education	128	%38.6	132	%40.7	
Maternal Employment Status					
Employed	172	%51.8	188	%58.0	0.110
Unemployed	160	%48.2	136	%42.0	
Family Type					
Nuclear	272	%81.9	244	%75.3	0.039*
Extended	60	%18.1	80	%24.7	
Total Number of Family Members					
2	8	%2.4	12	%3.7	0.000*
3	152	%45.8	44	%13.6	
4	96	%28.9	136	%42.0	
5	24	%7.2	68	%21.0	
6	36	%10.8	40	%12.3	
≥7	16	%4.8	24	%7.4	
Number of Children in Family					
1	172	%51.8	60	%18.5	0.000*
2	120	%36.1	176	%54.3	
3	32	%9.6	56	%17.3	
4	4	%1.2	28	%8.6	
≥5	4	%1.2	4	%1.2	
Rank of the Child in Family by Age					
Eldest	200	%60.2	152	%46.9	0.000*
Second Eldest	108	%32.5	108	%33.3	
Third Eldest and Younger	24	%7.2	64	%19.8	

Independent t-test; *p<0.05: statistical significance

Table 2: Comparison of mothers' knowledge, attitudes, and behaviors regarding fever in children aged 1–5 or 6–10 years

	1–5 years		6–10 years		p*
	n	%	n	%	
	332		324		
Have you ever taken your child to a hospital or physician for fever?					
Yes	244	%73.5	268	%82.7	0.004*
No	88	%26.5	56	%17.3	
Do you measure your child's body temperature when you think that he/she has fever?					
Yes	312	%94.0	300	%92.6	0.480
No	20	%6.0	24	%7.4	
Have you received any training on what to do when your child has fever?					
Yes	196	%59.0	188	%58.0	0.793
No	136	%41.0	136	%42.0	
If yes, who provided the training?					
Physician	112	%33.7	124	%38.3	0.001*
Nurse–Midwife	112	%33.7	128	%39.5	
Media	68	%20.4	56	%17.2	
Neighbors, relatives, or friends	40	%12.0	16	%4.9	
Do you feel anxious when your child has fever?					
Yes	232	%69.9	284	%87.7	0.000*
No	100	%30.1	40	%12.3	
What are the most common reasons that make you feel anxious when your					

child has fever?					
Convulsion	220	%66.3	228	%70.4	0.185
Death	32	%9.6	32	%9.9	
Brain damage	64	%19.3	52	%16.0	
Others n (%)	16	%4.8	12	%3.7	
How do you know if your child's body temperature is elevated?					0.000*
If his/her body feels warmer than normal	104	%31.3	132	%40.7	
By touching his/her skin	104	%31.3	116	%35.8	
Judging by the way he/she looks	52	%15.7	28	%8.6	
If his/her hands and feet get cold	48	%14.5	36	%11.1	
Others n (%)	24	%7.2	12	%3.7	
What is your first intervention when your child's fever rises?					0.000*
I resort to a healthcare facility	160	%48.2	52	%16.0	
I immediately have her/him take a cold shower	22	%6.6	88	%27.2	
I take his/her clothes off	70	%21.1	76	%23.5	
I wipe his/her body with vinegar-water mixture	4	%1.2	26	%8.6	
I give antipyretic medication.	56	%16.9	42	%14.8	
I apply cold or warm	16	%4.8	32	%9.8	
I make sure that he/she drinks plenty of water	4	%1.2	-		
What do you think is the body temperature that requires antipyretics?					0.000*
37.0°C–37.9°C	12	%3.6	86	%26.5	
38.0°C–38.9°C	196	%59.0	126	%39.1	
39.0°C–40.0°C	100	%30.1	90	%28	
>40°C	24	%7.2	20	%6.2	
How do you choose the antipyretic medication to be given to your child?					0.001*
By the prescription provided by a physician	102	%30.7	184	%56.8	
I give the medication prescribed by the previous physician the last time he/she had a fever	128	%38.6	54	%16.7	
I give the medication recommended by a pharmacist	12	%3.6	18	%5.6	
I give the medication that my relatives recommend	30	%9.0	18	%5.6	
I give any antipyretic medication available at home	52	%15.7	48	%14.8	
Others n (%)	8	%2.4	2	%0.6	
What do you do if fever persists?					0.155
I resort to a physician	260	%78.3	268	%82.7	
I wait	72	%21.7	56	%17.3	

Independent t-test; *p<0.05: statistical significance

The mean Turkish Version of the Parental Fever Management Scale(PFMS-TR) score was 32.68 ± 4.07. The mean score of mothers with children aged 1–5 years was 32.89 ± 4.04, and the mean score of mothers of children aged 6–10 years was 32.48 ± 4.11. There was no significant difference between the groups regarding the total score (p = 0.198). Subscale A1 and A8 mean that the scores of mothers with children aged 1–5 years were significantly higher than the other groups (p = 0.001 and p = 0.014, respectively). In the mothers with children aged 1–5 years, the mean score on the A3 subscale was lower (p = 0.012). There was no significant difference between the two groups regarding the mean scores for the A2, A4, 5, A6, and A7 subscales (Table 3).

Table 3: Evaluation of the Turkish Version of the Parental Fever Management Scale (PFMS-TR) by age range

	1–5 years	6–10 years	p*
When my child has fever. I usually...	332 Mean ± SD	324 Mean ± SD	
A1. measure his/her body temperature	4.39 ± 0.84	4.12 ± 0.83	0.000*
A2. want to know the degree of his/her fever	4.37 ± 0.78	4.25 ± 0.79	0.066
A3. make sure that he/she had plenty of fluid intake	3.90 ± 0.94	4.08 ± 0.90	0.012*
A4. resort to antipyretics	3.83 ± 0.95	3.85 ± 0.80	0.766
A5. keep a check on him/her throughout the night	4.38 ± 0.63	4.30 ± 0.78	0.167
A6. sleep in the same room with him/her	4.20 ± 0.84	4.18 ± 0.91	0.776
A7. wake him/her up at night to give him/her medications for reducing fever	3.69 ± 1.01	3.75 ± 0.88	0.466
A8. resort to a physician	4.09 ± 0.95	3.91 ± 0.82	0.014*
Fever Management Scale	32.89 ± 4.04	32.48 ± 4.11	0.198

Independent t-test; *p<0.05: statistical significance

DISCUSSION

In this study evaluating the attitudes and behaviors of mothers and the level of anxiety they experience when their children have a fever, the mean total score of the mothers PFMS-TR was 32.68 ± 4.07 points, and there was no significant difference in the age group. For both groups, the most common reason for feeling anxious was potential convulsions due to fever. In a study by Bong et al. [11] in Malaysia with parents of children aged 6 months-6 years, approximately 72% said they always felt anxious when their child had a fever, and 63.7% said they were concerned about the risks of fever, with seizures and brain damage being the most distressing. In a study by Kerdar et al. [3], including 481 parents with children aged 0-7 years, the most common causes of concern for the parents were febrile seizure(56%) and brain damage

(36.8%). Moreover, Abdinia et al. [12] reported that the main complication in fever was convulsions. Even though the incidence of febrile convulsions has been reported in the literature to be between 2% and 4%, similar to our findings, parents' greatest fear regarding fever is that their children will have convulsions [8,13-15]. Our study found that 73.5% of mothers with children aged 1-5 years and 82.7% of mothers with children aged 6-10 years had taken their children to the hospital at least once for fever. In terms of mothers' initial intervention in fever cases, our study found that mothers of children aged 1-5 years consulted a healthcare institution first, whereas mothers of children aged 6-10 years made their children have a cold water shower. The higher anxiety could explain the results that young mothers experience and the higher amount of experience mothers have as their children become

older. In a study by Sezici et al. [4], the researchers found that when children's fevers did not go down, their parents took them to a healthcare facility. The study conducted by Halicioğlu et al. [13] in İzmir, Turkey, found that 83.4% of children with fever were admitted to the emergency room.

Similarly, a study by Yigittalp [8] in Diyarbakır, Turkey, reported that 84.3% of mothers consulted healthcare facilities when their children experienced fever. In a study in Iran, the mothers who expressed that they would immediately take their children to a physician when they had a fever accounted for 25.6% of the participants [12]. The children were classified into two groups to conduct our study. As the risk of febrile convulsions is substantially higher in children aged 1-5 years, the initial intervention was thought to be "to consult to a healthcare facility." However, mothers with children aged 6-10 years are considered calmer since they are more experienced and try lowering fever at home by making their children have a cold water shower. Besides the level of knowledge that mothers possess, traditional approaches of society can affect fever management in children. In a study by Rajput et al. [16], including 100 parents with children under the age of 6 years in India, the researchers found that the most common ways to reduce fever were having a cold water shower and drinking medicinal herbal teas. A study conducted by Sezici [4] in İzmir, Turkey, found that the most common way of reducing fever was to wipe the body with a vinegar-water mixture and have a cold water shower. In contrast, the one by Yigittalp [8] in Diyarbakır, Turkey, reported that giving antipyretics and taking off clothes were the most common ways of managing fever. In a study by Kılıç et al. [5] in Adana, Turkey, in addition to those who chose cold application to reduce fever, it was found that 14% of mothers resorted to unfair practices, such as wiping with vinegar, cologne, and alcohol, and taking cold showers. Wiping the body with a vinegar-water mixture was reported at low rates in both groups.

In our study, the body temperature that the participants thought required antipyretics was reported to be 38.0°C-38.9°C by 59.0% of the mothers with children aged 1-5 years and 39.1% of those with children aged 6-10 years, and there was a difference between two groups. In a study by Abdinia et al. [12], 47% of mothers could not correctly describe the typical body temperature. In a study by Yigittalp [8], more than 50% of the mothers described a high fever as $\geq 38^{\circ}\text{C}$, whereas the remaining mothers did not know or had incorrect information about fever limits. A study in China reported that more than 50% of mothers described high fever as a body temperature of $\geq 38^{\circ}\text{C}$ [17]. In our study, over 38°C was considered an alarming body temperature by mothers. The percentage of mothers who said they measured their child's body temperature was above 90% in both groups in our study; however, the mothers with children aged 1-5 years scored significantly higher on the PFMS-TR when it came to measuring their child's temperature. The number of mothers responding "if his/her body feels warmer than normal" and "by touching his/her skin" was greater in the group of mothers with children aged 6-10 years, according to the responses given by the mothers to the question of how they knew whether their child's body temperature is increased. These results can be explained by mothers of younger children who have less experience and are more sensitive to fever. In a study by Gündüz et al. [18], including 816 mothers with children aged 3-15 years, they found that 60% of the mothers used thermometers at home to measure the body temperature of their children. A study by Chiappini et al. [15] conducted in Italy reported that 302 of the 388 parents used thermometers to measure their children's body temperature. In contrast, only 24 of the 164 parents used thermometers in India's study by Agrawal et al. [19]. The presence of various methods for measuring children's body temperature could be attributable to differences in mothers' educational levels and differences in the sociocultural and socioeconomic conditions of the investigated geographical regions.

In this study, concerning how parents decide the antipyretic medication, the majority (38.6%) of the mothers with children aged

1-5 years responded to "the medication prescribed by the previous physician," and the majority (56.8%) of those with children aged 6-10 years responded, "by the prescription provided by a physician." Çatakılı et al. [20] reported that 84.2% of mothers stated that they used the antipyretics recommended by a physician. In contrast, Halicioğlu et al. [13] found that 99% of mothers used antipyretic medication without consulting a physician. Fever is the most common symptom in children, and antipyretics are the most commonly prescribed medications. Parents can monitor their children with fever at home in most cases, as shown in the various study findings.

In a study by Esenay et al. [21] of 426 mothers with children aged 0-6 years, 78% said they learned about fever from healthcare workers, whereas 12% said they learned about it from neighbors or relatives, and 10% said they learned about it from the mass media. Most participants in a study by Sajadi and Khosravi [22] in Iran, which included 12 mothers with children aged 6-32 months, were found to have obtained information on fever from healthcare professionals. In a study where Westin and Levander [23] investigated parents' experiences of children with febrile convulsions in Sweden, the participating parents stated that healthcare professionals gave the most reliable support. In a study by Sezici [4], most mothers stated that the most reliable source of information for them was healthcare professionals; however, some others expressed that their mothers and elders were the most reliable. According to our study, most mothers in both age groups obtained the necessary training to reduce their children's fever, and most of these mothers received this training from doctors, nurses, and midwives.

One of the limitations of our study was the lack of a heterogeneous study group. Most of the study data were collected from low socioeconomic and sociocultural levels of family health centers. On the other hand, we did not know whether the parents had previously experienced a seizure or brain injury-like condition in their other children.

CONCLUSIONS

According to the results of our research, parents worry when their children get a fever, no matter what age they are. They use both traditional and medical methods to reduce fever. They also consult a physician and follow the physician's advice. Therefore, a societal inquiry is required to determine current parental knowledge and attitudes about fever, identify their requirements, and plan health training based on the information gathered in this respect. Hence, it is crucial to conduct training programs to ensure that mothers are correctly and adequately informed and aware of fever management to reduce the level of anxiety that they experience.

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