

ORIGINAL ARTICLE

# Assessment of Fever Phobia and Fever Management in Mothers of Febrile Children Admitted to Hospitals in Northwestern Syria: A Fever Phobia Survey Study

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## Abstract

**Background:** Childhood fever is a natural, positive biological strategy developed by the body to protect the child from potentially harmful foreign agents. Complaint of fever that worries families because it causes discomfort to children and is externally recognizable, and it is one of the most common reasons for presentation to pediatric emergency departments.

**Methods:** This study was conducted on the mothers of children aged 0-6 years admitted to the emergency departments of Cobanbey and Azaz Vatan Hospitals using the face-to-face interview technique.

**Results:** Over half of the mothers chose to administer antipyretic syrup as a first line of treatment, while one-third of the mothers initiated antibiotic therapy without seeking medical advice when their children had a fever. In addition, the decision to lower the body temperature was based on concerns that the child might have a seizure and/or be harmed due to high temperatures.

**Conclusion:** Education for mothers can improve care for children with fever and reduce unnecessary emergency room visits and the use of antibiotics and antipyretics. It may be useful for civil society organizations and state-based institutions to create opportunities for access to education and information in humanitarian aid activities in these and similar regions.

**Keywords:** Antipyretic, Body Temperature Changes, Hyperthermia, Syria.

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## INTRODUCTION

Childhood fever is a natural, positive biological strategy developed by the body to protect the child from potentially harmful foreign agents. Fever provides some survival benefits to the child but has a significant metabolic cost (1-3). Fever is a coordinated increase in body temperature following infectious disease, inflammation, malignancy, immunization, or administration of certain medications (4-7). Febrile diseases can also cause morbidity and mortality in children (8,9). In this case, fever is perceived by caregivers not as a symptom or sign of an underlying disease, but as a dangerous disease (10,11). Caregivers' perception that all fevers are harmful has been termed fever phobia, fever anxiety (12), or fever turmoil (2). This phobic behavior is common among parents, other caregivers, and even healthcare providers (4,7,13-15). This perception can lead to inappropriate medication practices, the waste of scarce resources, and the overuse of already overburdened healthcare facilities (13,16,17). In fact, worries families because it causes discomfort to children and is externally recognizable. It is one of the most common reasons for presentation to pediatric emergency departments (17-20).

It is not uncommon for families to employ inappropriate and potentially harmful methods for reducing fever, often driven by unwarranted fear and panic. The practice of alternating or combining antipyretics during a fever attack can result in irrational use. Such practices may result in confusion, inaccurate dosing, toxicities, and, in rare cases, mortality (14, 16, 17). The irrational use of antibiotics is also a common feature of this lack of knowledge and can result in concomitant risks such as antimicrobial resistance, antibiotic-associated diarrhea, and inflammatory diseases, including atopy associated with late-onset dysbiosis (17). Furthermore, inadequate knowledge of families regarding fever and its treatment, low maternal education, the number of children in the family, and the living environment have been identified as factors influencing maternal approaches to febrile children (18, 19, 21). While unnecessary and excessive use of antibiotics highlights antibiotic resistance, overuse of emergency departments increases the risk of emergency department crowding and the spread of infectious diseases. In areas such as Syria, where public health control is currently difficult, the use of uncontrolled health facilities and medicines may complicate the effective use of humanitarian aid. In particular, the

characteristics of the mother who has assumed the role of primary caregiver for a child also influence the perception outcome in low-income countries. In the northern Syrian region, characterized by low income and a post-conflict environment with ongoing civil unrest, early marriage, and limited educational opportunities represent significant challenges for mothers assuming care roles. However, a considerable number of children in this region are brought to the emergency department with complaints of fever. The objective of this study is to ascertain the approach of mothers in the region to their febrile children; their level of knowledge regarding fever; their fear of fever; and their methods of management when fever occurs.

## MATERIALS AND METHODS

### *Study Design*

This study, using the face-to-face interview technique, was conducted on the mothers of children aged 0-6 years admitted to the emergency departments of Cobanbey and Azaz Vatan Hospitals. A total of 203 participants who accepted the survey and met the inclusion criteria were included in the study. The study was approved by the Ethics Committee of Hatay Mustafa Kemal University for Noninterventional Research (Meeting date: 06/05/2021, Number of decisions: 15); the relevant hospital administrations. In addition, the study was conducted in accordance with the "Declaration of Helsinki" by the World Medical Association on Ethical Principles of Helsinki.

The study was conducted at Cobanbey and Azaz Vatan Hospitals. The hospitals were established by Türkiye in 2018 and 2020 as part of its humanitarian aid program (22-24). Local Syrian doctors and healthcare professionals are employed at these hospitals, while Turkish healthcare professionals provide consultancy services (25). Patients are admitted to these two hospitals from the Cobanbey and Azaz Vatan centers and surrounding small settlements.

### *Participant Selection*

The study included mothers of children aged 0-6 years admitted to Cobanbey and Azaz Vatan Hospitals Emergency Department, and subsequently hospitalized. Mothers who declined to participate in the survey or

who had a known mental disability or psychiatric disorder were excluded from the study. In cases where the child patient was admitted to the hospital, the biological mother was included in the study as part of a polygamous family. Those who agreed to participate in the survey were coded with the initials of their first and last names and the last two digits of their identification number (ID) numbers. This ensured participant confidentiality and prevented participant duplication.

### **Data Collection**

The questionnaire was prepared in Turkish following a comprehensive review of the existing literature on fever phobia and subsequently translated into Arabic by sworn translators. To assess their appropriateness, simplicity, and importance, the questions were evaluated by Syrian specialist physicians selected according to their experience and competence in the relevant subjects. Following a pilot study involving twenty individuals, the necessary corrections were implemented, and the questionnaire was finalized. The questionnaire was intended to ask questions that would allow deeper information to be obtained. However, after the pilot study, questions that differed between the intended queries and participants' understanding were removed from the questionnaire. The first section of the questionnaire pertains to the sociodemographic characteristics of the participants, while the second section comprises an 11-item instrument designed to assess maternal knowledge and attitudes regarding fever. The sociodemographic data form included inquiries regarding the participants' age, gender, educational status, income, number of children, place of residence, home, and family type. The second part of the questionnaire addressed knowledge of fevers, methods of measurement, and attitudes towards fevers.

### **Statistical Analysis**

Since there was no similar study in the region and the number of mothers was not clear, no sample calculation could be made. However, in order to reach as many mothers as possible, after obtaining ethics committee and administrative permissions, it was planned to administer the questionnaire to all mothers who visited emergency departments for a full calendar year and who agreed to be surveyed and accepted that they understood the questions and could answer them without hesitation.

The statistical analysis of the study was conducted using the Statistical Package for Social Sciences (SPSS) software, version 28.0 for Windows (IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp., USA). The descriptive statistics for the variables are presented as median (minimum-maximum) and n (%).

## **RESULTS**

A total of 203 mothers who met the established inclusion criteria and agreed to participate in the survey were included in the study. Two hundred mothers (98.5%) were married, while three (1.5%) were not. The mean age of the mothers was 30 years, with the youngest aged 15 years and the oldest aged 57 years. The median age at which the mothers gave birth for the first time was 19 years. The youngest mother was 14 years old, while the oldest was 33 years old. However, the age at first motherhood was predominantly concentrated between 16 and 20 years (n=147, 72.4%). A total of 58 participants (28.6%) had no formal education, 53 (26.1%) had completed primary school, 35 (17.2%) had completed middle school, 21 (10.3%) had completed high school, 25 (12.3%) had completed an associate degree, 9 (4.4%) had completed an undergraduate degree, and 2 (1.0%) had completed a postgraduate degree.

Of the participants, 60 (29.6%) resided in urban areas, 80 (39.4%) in rural counties, and 59 (29.1%) in rural villages. Of the mothers who participated in the study, 157 (77.3%) indicated that they resided in their place of origin, 25 (12.3%) in regular encampments, and 20 (9.9%) in irregular encampments. While 92 (45.3%) of the families of febrile children presenting to hospitals had a nearby health institution in the region where they lived, 111 (54.7%) did not.

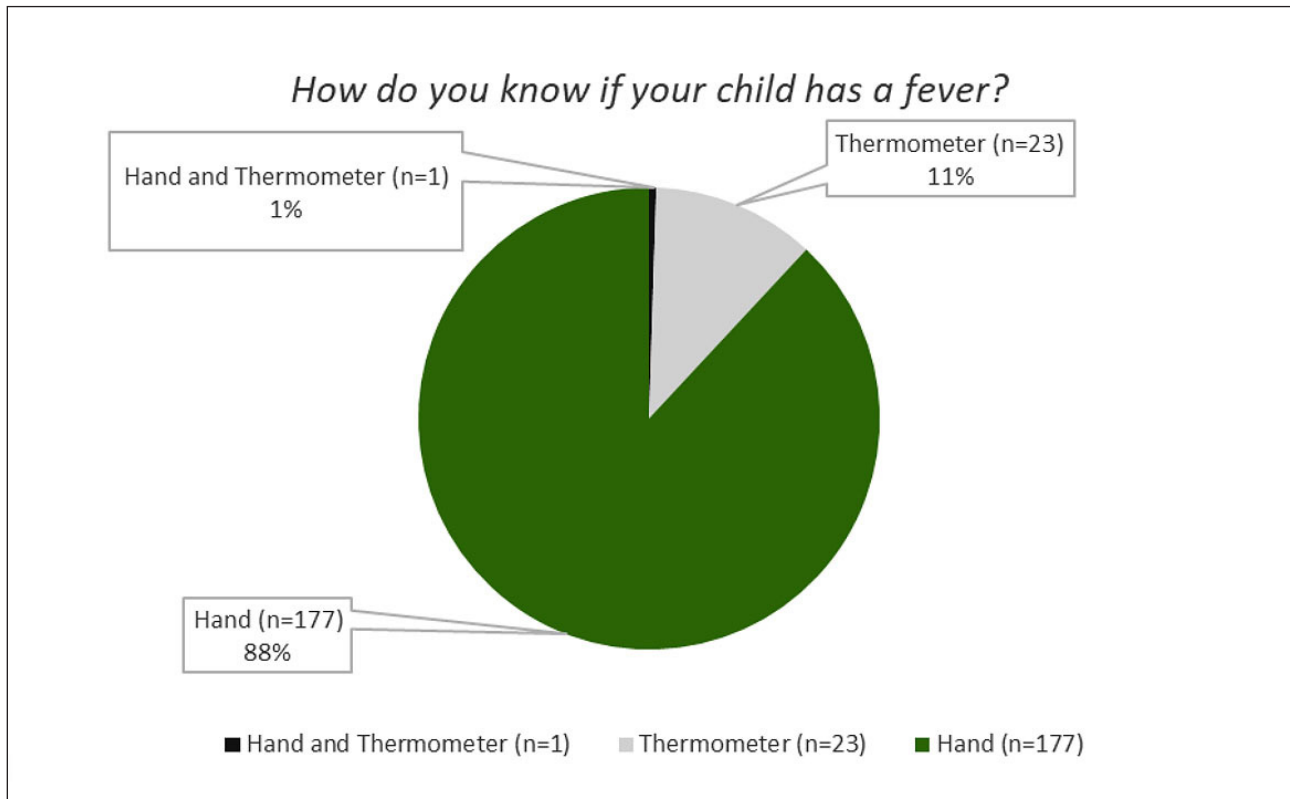
Of the families in question, 129 (63.5%) were identified as nuclear families, while 72 (35.5%) were classified as extended families. Only 2 (1.0%) mothers lived alone. The mean monthly income of the families was 750 Turkish Lira (approximately 100 US dollars), with a minimum of 100 Turkish Lira (approximately 13.3 US dollars) and a maximum of 8000 Turkish Lira (approximately 1066.7 US dollars).

The mean number of children per mother is 3, with a minimum of 1 and a maximum of 8. The mean age of the children was 8 years, with a minimum age of 2 months and a maximum age of 40 years.

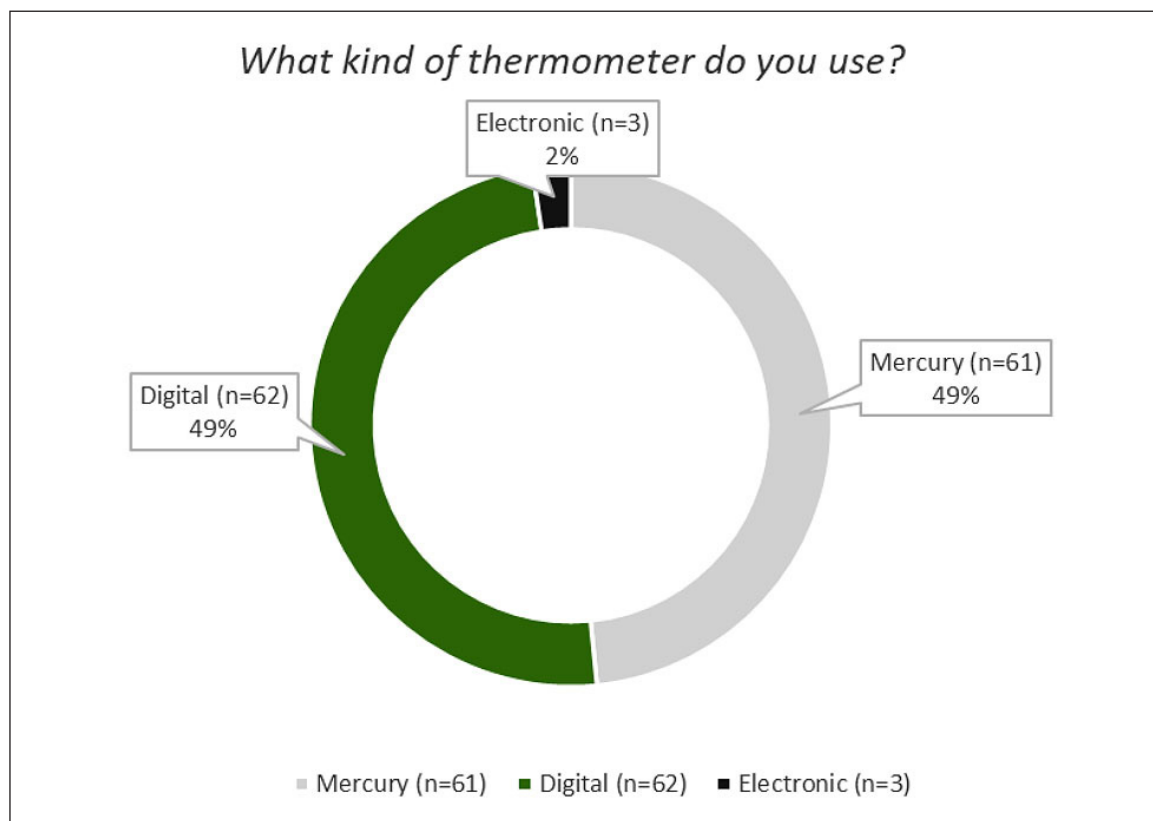
Twenty-five families (12.6%) had children who died due to the disease shortly after birth.

Evaluation of the responses provided by the mothers in the questionnaire regarding fever determined that 177 (88.1%) of mothers were aware of their children's fever status by feeling with their hands, 23 (11.4%) by using a thermometer, and 1 (0.5%) by employing both methods (Figure 1). With regard to thermometers, 61 (48.4%) of the mothers indicated that they had used a mercury manual thermometer, 62 (49.2%) had used a digital thermometer, and 3 (2.4%) had used an electronic thermometer (Figure 2).

In response to the question of where they measured their children's fever, 90 mothers (44.3%) indicated that they most frequently measured it on the skin, 37 (18.2%) at the mouth, 15 (7.4%) at the ear, 32 (15.8%) at the armpit, and 8 (3.9%) at the rectum. "62 (31.6%) of the mothers accepted 37 °C and above as fever, 73 (37.2%) accepted 38 °C and above as fever, 45 (23.2%) accepted 39 °C and above as fever, and 16 (8.2%) accepted 40 °C and above as fever.". The majority of participants (n=196, 99.0%) indicated that the fever should be lowered, while a smaller proportion (n=2, 1.0%) stated that it did not require lowering.



**Figure 1:** Distribution of participants' responses to the question "How do you know if your child has a fever?"



**Figure 2:** Distribution of participants' responses to the question "Which thermometer do you use?"

When the mothers were questioned about their actions when the child's fever began to rise, 82 (40.4%) stated that they took a lukewarm shower, 38 (18.7%) took a cold shower, 12 (5.9%) waited without taking any action, 13 (6.4%) covered the child, and 108 (53.2%) administered antipyretics.

When the attitudes of the participants were questioned in order to reduce the child's fever, 128 (63.1%) stated that they would give antipyretic syrup, 21 (10.3%) would take the child to the hospital immediately, 21 (10.3%) would call the doctor, 21 (10.3%) would use water with vinegar, 22 (10.8%) would take a warm shower, 34 (16.7%) would apply cold, and 1 (0.5%) would wait. 132 (65.3%) of the mothers stated that they used paracetamol, and 46 (22.8%) stated that they used ibuprofen.

Among the mothers of febrile children admitted to hospitals in Northwest Syria, 65 (32.5%) reported initiating antibiotic treatment without consulting a medical professional, while 135 (67.5%) stated that they did not. When asked why the fever should be reduced, 21

(10.3%) of the participants stated to prevent organ damage, 19 (9.4%) to prevent brain damage, 69 (34.0%) to prevent convulsions, and 104 (51.2%) to prevent the disease. With regard to the sources of information about fever in children, 130 (64.0%) of the mothers indicated that they received information from their families, 30 (14.8%) from doctors, 41 (20.2%) from midwives/nurses, 8 (3.9%) from television, 2 (1.0%) from radio, and 4 (2.0%) from social media.

The mean difference between the age of the mothers in the study and the age of their oldest child was 20 years (12–42 years). The minimum age difference between the mothers and their eldest child was 12 years, and the maximum was 42 years. In this case, it was determined that some mothers who participated in the survey gave birth to their first child under the age of 14, as reported by them. The average age difference between the mothers and their youngest child was 27 (12–46) years. The minimum age difference between the mothers and their youngest child was 12 years, and the maximum age difference was 46 years.

**Table 1. Distribution of participants' answers about level of education, age at first birth and information about their children, and their preferences regarding information about fever and care for a febrile child.**

<b>Survey Questions</b>	<b>n(%)</b>
<i>Education level</i>	
Illiterate	58(28.6)
Primary School	53(26.1)
Middle School	35(17.2)
High School	21(10.3)
Associate Degree	25(12.3)
Undergraduate Degree	9(4.4)
Post-Graduate Degree	2(1.0)
<i>Age at first motherhood, Median (Min-Max)</i>	<i>19(14-33)</i>
14	3(1.5)
15	9(4.4)
16	19(9.4)
17	28(13.8)
18	24(11.8)
19	32(15.8)
20	44(21.7)
21+	44(21.7)
<i>How many children do you have, Median (Min-Max)</i>	<i>3(1-8)</i>
1	39(19.2)
2	29(14.3)
3	45(22.2)
4	29(14.3)
5	32(15.8)
6	13(6.4)
7	8(3.9)
8	8(3.9)

<i>Average age of your children</i>	<i>8(2months-40 years)</i>
<i>Did you experience the death of a child after birth?</i>	
Yes	25(12.6)
No	174(87.4)
<i>If yes, cause of death*</i>	
Diarrhea, fever	2(9.1)
Birth-related causes	11(49.9)
Hepatitis	4(18.2)
Cardiac Failure	1(4.5)
Consuming chemical substances	1(4.5)
Respiratory Distress	1(4.5)
Traffic Accident	2(9.1)
<i>Which do you often prefer to take your child's temperature?#</i>	
Mouth	37(18.2)
Ear	15(7.4)
Armpit	32(15.8)
Rectal	8(3.9)
Skin	90(44.3)
<i>According to you, how many °C body temperature is considered fever?</i>	
37 °C and above	62(31.6)
38 °C and above	73(37.2)
39 °C and above	45(23.0)
40 °C and above	16(8.2)
<i>Should the fever be lowered?</i>	
Yes	196(99.0)
No	2(1.0)
<i>What do you do when your child's temperature starts to rise?</i>	
Lukewarm shower	82(40.4)
Apply cold	38(18.7)
Wait	12(5.9)
Cover the child	13(6.4)
Administer antipyretics	108(53.2)



<i>When your child has a fever, what do you do to reduce it?</i>	
Administer antipyretic syrup	128(63.1)
Take the child to the hospital immediately	21(10.3)
Contact medical professional	21(10.3)
Use water with vinegar	21(10.3)
Lukewarm shower	22(10.8)
Apply cold	34(16.7)
Wait	1(0.5)
Other	2(1.0)
<i>What is the antipyretic medicine you often use?</i>	
Paracetamol	132(65.3)
Ibuprofen	46(22.8)
No	24(11.9)
<i>Do you begin to give your child antibiotics without consulting your doctor?</i>	
Yes	65(32.5)
No	135(67.5)
<i>What is your reason for wanting to reduce the fever?</i>	
Prevent organ damage	21(10.3)
Prevent brain damage	19(9.4)
Prevent convulsions	69(34.0)
Cure the disease	104(51.2)
Other	20(9.9)
<i>Where did you learn about fever in children?</i>	
Family	130(64.0)
Doctor	30(14.8)
Midwife/Nurse	41(20.2)
Television	8(3.9)
Radio	2(1.0)
Social media	4(2.0)
<i>Min-Max: Minimum-Maximum. #: Multiple options can be checked. *Missing values are not included in the % calculation. Valid percent values are used.</i>	



## DISCUSSION

The study revealed that approximately one-third of the mothers were unaware of the threshold for fever, with the majority seeking to lower the fever. Over half of the mothers chose to administer antipyretic syrup as a first line of treatment, while one-third initiated antibiotic therapy without seeking medical advice when their children had a fever. Additionally, the rationale for the decision to reduce the body temperature was the concern that the child would experience a seizure and/or suffer harm as a result of the elevated temperature. It was observed that more than half of the mothers had acquired the information that formed the basis for such attitudes and behaviors from their families, while the remaining portion had obtained the information from doctors, nurses, midwives, and mass or social media.

Encountering a new phenomenon can cause anxiety because of human nature. Mothers encounter many new situations with their first child. The mother may experience anxiety in response to either normal or abnormal situations involving the child. A lack of life experience and emotional maturity on the part of the mother may contribute to an increase in anxiety levels (26). As time progresses and society progresses, the age at which women give birth for the first time has also increased, and in many countries the average age is now over 28 years old (27, 28). However, due to significant socio-economic inequalities between countries, the timing of the first birth varies considerably between different national contexts. At the national level, social norms and family policies may have an impact on the timing of the first birth. Societies have established norms regarding the optimal age for becoming a parent, which is often perceived as either premature or delayed (26). The European Social Survey revealed that the perceived ideal age for first birth is 25.3 years in France and 24.2 years in Great Britain (29). Consequently, contemporary trends are increasingly marginalizing early entry into motherhood, particularly during adolescence. This is particularly evident in Western countries, where adolescent motherhood is perceived as problematic not only for the mother but also for her child and society as a whole (29). Some studies in the existing literature indicate that the age at which women give birth for the first time varies according to their level of education. In the study by Rendal et al. evaluating developed countries,

it was demonstrated that the age at first birth increased in accordance with the level of education, for the 1950s, and this phenomenon was even more pronounced in the subsequent years (30). Concurrently, Tomkinson et al. discovered that involvement in higher education had a detrimental impact on the likelihood of becoming a first-time parent (29). In the existing literature, socio-economic status is also identified as a factor associated with the age at first motherhood. A low level of socio-economic status is associated with a younger age at first motherhood; moreover, this low level may be related to a higher incidence of adolescent pregnancies (31). Furthermore, Rendal et al. demonstrated that the age of first childbirth was influenced by the employment status of women (30). The findings of Özel et al. (32) indicate that the age at pregnancy among Syrian immigrants in Türkiye is notably younger, with a significantly higher prevalence of adolescent pregnancies compared to Turkish pregnant women. In a more recent study, it was demonstrated that the aforementioned circumstances persisted in Syrian pregnant women who had resided in their current country for a minimum of 10 years (33). Sayili et al. investigated pregnant women in Turkey, and the mean age at first pregnancy in Syrian immigrant pregnant women was found to be 20.6 years, which was lower than the mean age at first pregnancy in Turkish pregnant women (34). In a further study conducted in Lebanon, it was determined that the majority of adolescent pregnancies were among Syrian immigrants (35). In a further study conducted in Aleppo as a sample from Syria, the age at first motherhood was found to be 18.9 years in women who had experienced violence and 20.3 years in women who had not experienced violence (36). In this study, the median age at first motherhood was found to be 19 years (range 14-33 years), consistent with the findings of previous literature. The age at first motherhood was found to be concentrated between 16 and 20 years.

Although modern thermometers are now used to detect fever, half a century ago the literature suggested that thermometers were not superior to hand contact measurement (37). In the following years, this situation was addressed with quantitative studies that demonstrated thermometers to be superior, but also showed that the success rate in detecting fever improved with greater experience in attempting to detect fever by hand measurement (38).

After 1980, subjective methods used by mothers to detect fever were evaluated in the literature, and it was found that 86% of mothers used measuring temperature by hand. In particular, when taking temperature from the trunk and abdomen by hand, the rate of correct detection of fever in the child was 71.4%, while 93.3% of mothers were able to detect the absence of fever in a child (39). In this study, it was determined that 88.1% of mothers knew that their child had a high fever by measuring it with their hands, 11.4% by using a thermometer, and 0.5% by using both methods, in line with the literature.

While the fact that the contact method is preferred over thermometers in half a century of literature reveals the importance of physical examination, it may suggest that spot fever measurement methods and devices may still need development.

Due to the risk of internal conflict and terrorism, neutral observers in home settings do not have the opportunity to observe mothers' practices and attitudes regarding fever management. The study did not include mothers who visited other private institutions or who could not come to the hospital. Direct verbal communication between the researchers and the participants could not be established, and communication was limited to interviewers and interpreters. For this reason, the participants were asked to select answers to direct questions in the study. This may have limited the participants' ability to freely provide more information.

The implementation of public education initiatives targeting mothers caring for febrile children could potentially lead to improved care for children with high fever and a reduction in unnecessary emergency admissions, antibiotics, and antipyretic use. It may be useful for civil society organizations and state-based institutions to create opportunities for access to education and information in humanitarian aid activities in these and similar regions. In these trainings, we believe that repeatedly explaining the correct fever measurement techniques to every mother visiting health units during pregnancy and teaching the correct use of thermometers can improve the care of children with fever and prevent unnecessary emergency admissions and drug use.

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#### Abbreviations list

ID: Identification number

SPSS: Statistical Package for Social Sciences

#### Ethics approval and consent to participate

This study was approved by the Non-Interventional Clinical Trials Ethics Committee of Hatay Mustafa Kemal University Tayfur Ata Sökmen Faculty of Medicine on 06.05.2021 with decision number 16.

#### Consent for publication

Informed consent was obtained from all individual adult participants included in this study.

#### Availability of data and materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

#### Competing interests

The authors declare that they have no conflict of interest.

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#### Authors' contributions

All authors contributed at all stages.

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