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# EVALUATION OF FEVER MANAGEMENT AND RATIONAL DRUG USE IN MOTHERS OF CHILDREN UNDER THE AGE OF FIVE

## BEŞ YAŞ ALTI ÇOCUKLARIN ANNELERİNDE ATEŞ YÖNETİMİ VE AKILCI İLAÇ KULLANIMININ DEĞERLENDİRİLMESİ

Tuğba YAZICI[1] , Ruhuşen KUTLU[1]

[1]Necmettin Erbakan University, Meram Medical Faculty, Department of Family Medicine, Konya, Turkiye

**ORCID IDs of the authors:** R.K. 0000-0002-8502-0232; T.Y. 0000-0001-6933-1315

## ABSTRACT

**Objective:** The aim of this study was to evaluate the parental practices towards fever management and rational drug use in mothers with children under the age of five.

**Materials and Method:** This research was planned as a cross-sectional analytical study. The study was conducted on 342 mothers with children under five years of age who applied to family health centers (FHCs). The Parental Fever Management Scale (PFMS-TR) and Rational Drug Use Scale (RDUS) were applied to the participants.

**Results:** The average age of the mothers was 30.8±5.7 years, and 50.6% (n=173) had high school education or above. Of the participants, 89.5% (n=306) stated that they had a thermometer at home and 49.7% (n=170) first sensed that their children had a fever by touching them, while 38% (n=130) understood by their appearance, and 38.3% (n=126) applied to FHCs first for treatment. There was a significant correlation between the mothers' PFMS scores and their age, marital, planned pregnancy, educational status and place of residence (p<0.05). There was a significant relationship between the RDUS scores and age at marriage, age at first birth, employment status, kinship status with spouse, presence of caregivers, educational status, place of residence, family type, and economic situation (p<0.05).

**Conclusion:** Although almost all of the mothers had a thermometer at home, it was noteworthy that only one-tenth detected the fever using a thermometer. It was observed that mothers who have a high school education or above, are employed, marry at an advanced age, and give birth after the age of 22, use the drugs more rationally. The family physician is mostly the first person to that parents apply. Informing the parents of a febrile child about how they should approach the situation will both relax the family and reduce unnecessary applications to health institutions.

**Keywords:** Child, fever, parental fever management, rational drug use

## ÖZET

**Amaç:** Bu çalışmada beş yaş altı çocukların annelerinde ateş yönetimi ve akılcı ilaç kullanımına yönelik tutumunun değerlendirilmesi amaçlanmıştır.

**Gereç ve Yöntem:** Bu araştırma, kesitsel tipte analitik bir çalışma olarak planlanmıştır. Araştırma, aile sağlığı merkezlerine (ASM) başvuran beş yaş altı çocuğu olan 342 anne üzerinde yapılmıştır. Katılımcılara Ebeveyn Ateşi Yönetim Ölçeği (EAYÖ) ve Akılcı İlaç Kullanımı Ölçeği (AİKÖ) uygulandı.

**Bulgular:** Annelerin yaş ortalaması 30,8±5,7 yıl olup, %50,6'sı (n=173) lise ve üstü eğitimli idi. Katılımcıların %89,5'i (n=306) evde ateş ölçer bulunduruyorlardı ve %49,7'si (n=170) çocuklarının ateşlendiğini ilk olarak dokunarak, %38'i (n=130) dış görünüşünden anlıyorlardı, %38,3'ü (n=126) ilk olarak aile sağlığı merkezlerine müracaat ediyorlardı. Annelerin EAYÖ puanı ile yaş, evli olmak, gebeliğin planlı olması, eğitim durumu ve yaşadığı yer arasında anlamlı bir korelasyon vardı (p<0,05). AİKÖ puanı ile evlenme yaşı, ilk doğum yaşı, çalışma durumu, eşi ile arasında akrabalık durumu, bakıcı varlığı, eğitim durumu, yaşadığı yer, aile yapısı ve ekonomik durumu arasında anlamlı (p<0,05) bir ilişki vardı.

**Sonuç:** Annelerin neredeyse hepsi evde ateş ölçer bulundurmasına rağmen, sadece onda birinin çocukları ateşlendiğinde ateş ölçer kullanarak ateşini tespit etmesi dikkat çekicidir. Lise ve üstü eğitimli olan annelerin, çalışanların, ileri yaşta evlenenlerin, ilk doğumunu 22 yaşından sonra yapanların ilaçları daha akılcı kullandıkları görülmüştür. Çoğunlukla ilk başvurulan yer olan aile hekimi olarak bizlerin ateşli çocuğa ebeveynin nasıl yaklaşması gerektiği konusunda bilgilendirme yapması hem aileyi rahatlatacak, hem de sağlık kuruluşlarına gereksiz başvuruyu azaltacaktır.

**Anahtar Kelimeler:** Çocuk, ateş, ebeveyn ateşi yönetimi, akılcı ilaç kullanımı

## INTRODUCTION

Fever is an increase in body temperature above normal values under the control of the central nervous system in response to a specific stimulus. One of the most frequent reasons for parents to apply to primary health care centers and emergency services is fever in children. Most families perceive fever as a disease rather than a symptom. Fever is a symptom and a sign of disease, rather than a disease (1-4). The most common cause of fever in primary care applications is acute viral diseases, such as upper respiratory tract infections (3-6). Fever causes anxiety that will result in unnecessary treatment for patients, parents, and healthcare providers. It is the physiological response of the body to a disease process and is important in combating infection, and only requires treatment to ensure patient comfort (3,7). Most families do not use antipyretic drugs at the appropriate dosage. For this reason, health professionals play a great role in how parents approach fever. Providing education to the family on subjects such as the definition of fever, its causes, and first interventions to a child with fever will contribute to the prevention of incorrect care for children with fever and reduce their applications to emergency services (8-10).

Patients use uncontrolled medication without prior consultation with physicians through their previous experiences, the internet, advice from family members, other healthcare professionals, and/or media channels, and this shows that rational drug use (RDU) is not given the necessary importance (11-13).

In developing countries, less than 40% of patients in family health centers (FHCs)/primary care institutions and public hospitals, and less than 30% of patients receiving services from the private sector, are treated according to standard treatment guidelines (12). It should be kept in mind that the use of antibiotics, antidepressants, antihistamines, etc., without prescription, and use by the patient unconsciously and openly, leading to abuse, can pose a danger to human and environmental health (13). In a meeting held by the World Health Organization in Nairobi in 1985, RDU, according to the clinical findings and individual characteristics of the patients, was defined as a set of rules to be followed in order to be able to reach the appropriate drug, at the appropriate time and dose, at the lowest cost and most easily (14).

The aim of this study was to evaluate the parental practices towards fever management and rational drug use in mothers with children under the age of five. It is valuable in that such a study has not been done before and that the study was carried out in a primary health center.

## MATERIALS AND METHODS

### Type, place, and population of the research
This research was a cross-sectional analytical study conducted between April 2019 and June 2019. The study population comprised 342 mothers with children under five years of age who applied to three randomly selected family health centers (FHCs). At the time of the study, there were 99 FHCs in the Meram, Selcuklu and Karatay districts of Konya city center. From each of these three districts, one FHC center was selected using a randomized number table. The population served by these centers was similar in socioeconomic terms. Mothers who brought their children to the health center for a vaccination or a health check-up were interviewed in the waiting room using a face-to-face interview technique.

In previous studies, the frequency of applying to emergency services due to fever was reported as 22.3% (15). Since the number of individuals in the population was not known in this study, it was planned to reach at least 322 mothers in the study by using the $n=t^2.pq/d^2$ formula with a 95% confidence interval and 5% margin of error. A 10% share was added due to the possibility that some people did not complete the survey questions and refused to participate in the research. When missing and incorrectly answered questionnaires were excluded, the data of 342 mothers were evaluated in the study.

### Exclusion criteria
Those who did not agree to participate in the study, mothers without children under 5 years of age, those with a severe psychiatric illness, were verbally unable to communicate, whose native language was not Turkish, and mothers whose children had chronic diseases, such as immunodeficiency, diabetes, cystic fibrosis, chronic kidney failure, malignancy, connective tissue disease, and malabsorption syndromes, which cause frequent fever and antibiotic use in children under 5 years of age, were not included in the study.

### The ethical permission of the study
Ethical permission for the study was granted before the study began from the Ethics Committee (Date: 08.02.2019, No: 2019/1687). The participants were informed about the study, and their written and verbal consents were obtained according to the ethical principles of the Helsinki Declaration. After the ethics committee's approval was obtained for the study, written permission was obtained from Konya Provincial Health Directorate. Then, randomly determined family health centers were visited and responsible physicians were interviewed and their permissions were obtained.

### Data collection tools
A questionnaire in which sociodemographic characteristics were questioned, and the Parental Fever Manage-

ment Scale (PFMS-TR), and Rational Drug Use Scale (RDUS), were applied to the participants. In order to determine the clarity and functionality of the data collection form, pre-research data collection tools were applied to 15 mothers who met the inclusion criteria. The questionnaire was clear, and no corrections were made to the questionnaire forms. The surveys made in the pre-application were included in the scope of the research.

### Sociodemographic information form

There were 39 questions in the sociodemographic information form. In this form, there were questions describing the characteristics of the participants, such as age, marital status, educational status, employment status, economic status, longest place of residence, family type, and smoking and alcohol habits. In addition, kinship status with their spouse, age at marriage, birth information, number of children, knowledge of normal body temperature, fever, and her approach to the child with fever, the possible effects of fever, drug preparation skills, nonprescription drugs, storage of drugs during and after treatment, and questions that were shaped according to the factors thought to be related to RDU and fever management in previous studies were also included. Education status was asked as multiple choice question under six sub-headings, and according to the distribution of the data collected, the answers were evaluated in two groups as people educated at middle school and below and people educated at high school and above.

### Parental Fever Management Scale (PFMS)

The PFMS was developed by Walsh et al. to evaluate parents regarding fever management in 2008 (16). It was translated into Turkish in 2013 and its validity and reliability were established in a study by Cinar et al. (17). The total internal consistency coefficient of the PFMS was calculated using the Cronbach alpha as 0.79. With the scale consisting of eight questions, the actions taken by the mother when the child was fired were questioned. Participants can choose from 5 answers, comprising 1=never, 2=rarely, 3=sometimes, 4=mostly, and 5=always. Participants can score a minimum of 8 points and a maximum of 40 points on this scale. Higher scores on the scale indicate that mothers develop higher anxiety and fever phobia during care for children's febrile diseases. It expresses that parental care burden increases during children's febrile illnesses. In this presented study, the total internal consistency coefficient of the PFMS was calculated using the Cronbach alpha as 0.723.

### Rational Drug Use Scale (RDUS)

The RDUS was developed by Demirtas et al. in 2018 and its validity and reliability was thereafter established (18). The total internal consistency coefficient of the RDUS was

calculated using the Cronbach alpha as 0.789. The RDUS is a scale that consists of 10 true, 11 false, and a total of 21 propositions. Each proposition is expected to be answered as right, wrong, and I do not know. Ten of the questions (1, 3, 4, 7, 8, 11, 12, 14, 18, 21) are scored as true=2, I do not know=1, and false=0. Eleven of the questions (2, 5, 6, 9, 10, 13, 15-17, 19, 20) are scored as true=0, I do not know=1, and false=2. As the level of knowledge increases, the score obtained from the survey is considered to increase (18). An ROC analysis was performed according to the knowledge scores of the participants on the questionnaire, the variable of having a thermometer at home, and the estimation value was calculated as 36.5 points. Those who scored 36.5 or above were interpreted as having RDU knowledge and those who scored below 36.5 were scored as not as having RDU knowledge. In this presented study, the total internal consistency coefficient of the PFMS was calculated using the Cronbach alpha as 0.608.

### Statistical evaluation of the data

While evaluating the findings obtained from the study, an IBM SPSS Statistics 20.0 (Armonk, NY, USA) was used for the statistical analysis. Descriptive statistics for continuous variables were expressed as the mean±standard deviation, while descriptive statistics for the categorical data were expressed as frequency and percentage. Shapiro-Wilk and Kolmogorov-Smirnov tests were used to check the compatibility of the data to normal distribution. A chi square test was used for statistical analysis of the categorical data, while an independent t test was used in binary groups for data that fit the normal distribution for a statistical analysis of quantitative data. A one way ANOVA test (post hoc Tukey test) was used in groups with 3 or more, and Mann-Whitney U and Kruskall-Wallis tests were used for data that did not fit the normal distribution for statistical analysis of the quantitative data. The statistical significance was accepted as $p<0.05$. Relations between the parameters were determined using a Pearson correlation analysis. It was considered a weak relationship if the correlation coefficient (r) was between 0.00 and 0.24, medium between 0.25 and 0.49, strong between 0.50 and 0.74, and very strong between 0.75 and 1.00.

### RESULTS

Of the 342 participants with children under five years of age, 31.9% (n=109) were registered in Meram FHC, 33.0% (n=113) in the Selcuk FHC, and 35.1% (n=120) in the Karatay FHC. Of the mothers, 53.2% (n=182) were over 30 years of age, 98.2% (n=336) were married, 50.6% (n=173) had high school education or above, and 82.5% (n=282) were unemployed. The sociodemographic characteristics of the participants are shown in Table 1.

The average age of the mothers was 30.8±5.7 years (19–44). The average age at marriage was 21.44±3.5 years (13–35) and the mean age at first birth was 23.1±3.8 years (14–39). The median number of births was 2 (1–5), and the number of abortions was at most 7. Of the participants, 8.5% (n=29) got married when they were under the age of 18, and 3.2% (n=11) became mothers when they were under the age of 18.

When the mothers were questioned about their knowledge about the normal body temperature, they estimated the normal body temperature information as an average of 35.9±1.8°C, a minimum value of 20°C, a maximum value of 39°C, and a median value of 36°C.

Of the mothers participating in the study, 78.1% (n=267) knew the normal body temperature. When the normal body temperature information status of the mothers and the age at marriage were compared, the mean age at marriage was higher in those who indicated normal values (p=0.014[ab]).

There was no statistically significant difference when the knowledge that the mother had of normal body temperature was compared with the total score of the PFMS (p=0.409). When the knowledge that the mother had of normal body temperature and the total RDUS score were compared, the score of those who indicated the normal body temperature was statistically significantly higher than that of those who indicated low and high values (p<0.001[ab], p=0.043[bc]) (Table 2).

Of the mothers, 33.3% (n=114) stated that their children had fever 1–2 times a year, 30.7% (n=105) stated 3–4 times a year, 22.8% (n=78) stated 5 or more times a year, and 13.2% (n=45) stated that their child had never had a fever. Of the participants, 89.5% (n=306) stated that they had a thermometer at home and 49.7% (n=170) first sensed that their child had fever by touching them, while 38% (n=130) understood from their appearance. When the mothers were asked how many degrees they worried about when their child had a fever, 56.1% (n=192) indicated ≥38°C and 24.6% (n=84) indicated ≥39°C.

When the mothers were asked about the frequency of checking the temperature of their febrile child, 43.2% (n=142) stated at 15-min intervals, 31.0% (n=102) at 30-min intervals, 6.4% (n=21) stated at 1-h intervals, and 2.1% (n=7) stated at 2-h intervals. Moreover, 38.6% (n=127) stated that they received the first medical aid from the doctor, while 21.6% (n=71) stated that they searched on the internet (Table 3).

When the first interventions of the participants for their febrile child were questioned, 89.7% (n=295) stated that they removed the child's clothes, 88.4% (n=291) gave antipyretic syrup/suppository, 79.6% (n=262) gave the child

**Table 1:** Sociodemographic characteristics of the participants

| Parameters | n | % |
| --- | --- | --- |
| **Maternal age** | | |
| <30 years | 160 | 46.8 |
| ≥30 years | 182 | 53.2 |
| **Age at marriage** | | |
| <21 years | 163 | 47.7 |
| ≥21 years | 179 | 52.3 |
| **Age of first birth** | | |
| <22 years | 147 | 43.0 |
| ≥22 years | 195 | 57.0 |
| **Employment status** | | |
| Employed | 60 | 17.5 |
| Unemployed | 282 | 82.5 |
| **Consanguinity with spouse** | | |
| Yes | 35 | 10.2 |
| No | 307 | 89.8 |
| **Presence of deceased children** | | |
| Yes | 11 | 3.2 |
| No | 331 | 96.8 |
| **Education status** | | |
| ≤Middle school | 169 | 49.4 |
| ≥High school | 173 | 50.6 |
| **Marital status** | | |
| Married | 336 | 98.2 |
| Unmarried | 6 | 1.8 |
| **Longest place of residence** | | |
| Center | 290 | 84.8 |
| District and villages | 52 | 15.2 |
| **Number of births** | | |
| <2 delivery | 104 | 30.4 |
| ≥2 delivery | 238 | 69.6 |
| **Family type** | | |
| Nuclear family | 272 | 79.5 |
| Extended family | 64 | 18.7 |
| Fragmented family | 6 | 1.8 |
| **Economic situation** | | |
| Economic income less than expenses | 99 | 28.9 |
| Economic income equivalent to expenses | 184 | 53.8 |
| Economic income over expenses | 59 | 17.3 |
| **Smoking status** | | |
| Still smoking | 50 | 14.6 |
| Not smoking | 292 | 85.4 |
| **Alcohol use status** | | |
| Do not use alcohol | 340 | 99.4 |
| Drinking alcohol 1–2 times a month | 2 | 0.6 |

**Table 2:** Comparison of mothers' knowledge of normal body temperature with some parameters

| | <36°C Low (a) Mean±SD | 36°C-37.5°C Normal (b) Mean±SD | >37.5°C High (c) Mean±SD | F | p |
|---|---|---|---|---|---|
| **Maternal age** | 30.5±6.6 | 31.0±5.5 | 28.9±3.8 | 1.097 | 0.335 |
| **Age at marriage** | 20.3±3.0 | 21.7±3.5 | 21.9±3.2 | 4.094 | **0.014**[ab] |
| **Age of first birth** | 22.1±3.7 | 23.3±3.9 | 23.3±3.5 | 2.564 | 0.078 |
| **Number of births** | 2.2±1.1 | 2.2±1.1 | 2.1±0.7 | 0.140 | 0.869 |
| **PFMS-TR total score** | 34.9±3.5 | 35.3±3.3 | 34.2±3.7 | 0.896 | 0.409 |
| **RDUS total score** | 33.2±5.7 | 36.8±4.0 | 34.0±5.6 | 18.087 | **<0.001**[ab] 0.043[bc] |

SD: Standard deviation, PFMS-TR: Parental Fever Management Scale, RDUS: Rational Drug Use Scale, ab: relationship between normal and low fever, bc: relationship between normal and high fever

a warm shower, 73.9% (n=243) applied warmth, 43.8% (n=144) took the child to the doctor, 28.6% (n=94) wiped the child's body with vinegar, and 1.2% (n=4) gave the child antibiotics.

When the mothers were asked what the harm the fever could cause to their children, 89.4% (n=303) stated that the child could have a febrile convulsion, 49.3% (n=167) stated the fever could harm the child's brain, 26.3% (n=89) stated that the child could become disabled, 18% (n=61) stated the child could become infertile, and 13% (n=44) stated that the child could die.

When the mothers were questioned about giving non-prescription drugs to their child for the fever, 41.8% (n=139) of the mothers stated that the most common given were antipyretics, 13.5% (n=45) gave analgesics, 6.9% (n=23) gave vitamins, 0.9% (n=3) gave antibiotics, and 36.9% (n=123) stated that they did not give any non-prescription drugs. Of the mothers, 37.8% (n=125) kept the remaining medications for later use, 35.5% (n=117) discarded them, and 26.7% (n=88) stated that they kept the antibiotics and were hiding the others.

When the mothers of the study were asked about the places they stored the drugs, 59.7% of the mothers who kept them in the refrigerator had middle school education or below, while 58% of the mothers who kept them in a cool and closed place, 71.1% of those who kept them at room temperature, and 61.1% of those who kept them in the medicine cabinet had high school education or above (p=0.001).

In this study, the total internal consistency coefficient of the PFMS was calculated using the Cronbach alpha as 0.723. The mean total score of the PFMS was 35.2±3.4 points (14–40). When the PFMS scores of the mothers were compared with the sociodemographic characteristics, there was a significant relationship between the age at marriage (p=0.035), planned pregnancy (p=0.039), educational status (p=0.027), and place of residence (p=0.027) (Table 4).

In this study, the total internal consistency coefficient of the RDUS was calculated using the Cronbach alpha as 0,608. In the ROC analysis, the area under the ROC curve (AUC) was determined as 0.602 (AUC=0.602). For appropriate RDU behavior information, the predictive value of the scale was determined using the ROC analysis and calculated as 36.5. According to the RDUS, 54.4% (n=186) of the mothers had a sufficient knowledge level of RDU (RDUS ≥36.5) Figure 1.

Mothers with an age of marriage of 21 years or above (p=0.006), age at first birth of 22 years or above (p=0.009), were employed (p<0.001), an income level to expenses that was equal or higher (p=0.004), had resided for the longest time the city center (p=0.003), had a nuclear family (p=0.007), had a good kinship status with their spouse (p=0.047), and had a high school education or above (p<0.001) had a score of 36.5 or above, and their knowledge was sufficient (Table 5).

When the correlation between the age at marriage of the participants and the total RDUS score was examined, a positive weak correlation was found (r=0.167, p=0.002). When a linear regression analysis was conducted, 2.8% of those with a high total RDUS score also had a high age at marriage ($R^2$=0.028, p=0.002).

When the correlation between the total PFMS score and the total RDUS score was examined, a positive weak correlation was found (r=0.138, p=0.012). When a linear regression analysis was performed, 1.9% of those with a high PFMS total score also had a high RDUS total score ($R^2$=0.019, p=0.012). The correlation of some parameters with the PFMS and RDUS are shown in Table 6.

**Table 3:** General attitudes of mothers about fever management in their children

|  | n | % |
| --- | --- | --- |
| **How often does your child get a fever?** | | |
| 1–2 times a year | 114 | 33.3 |
| 3–4 times a year | 105 | 30.7 |
| 5 or more times a year | 78 | 22.8 |
| Never | 45 | 13.2 |
| **Do you have a thermometer in your home?** | | |
| Yes | 306 | 89.5 |
| No | 36 | 10.5 |
| **How do you know if your child has a fever?** | | |
| Appearance | 130 | 38.0 |
| Touching | 170 | 49.7 |
| With thermometer | 42 | 12.3 |
| **Where do you take your child's temperature?*** | | |
| Forehead | 141 | 42.3 |
| Ear | 21 | 6.3 |
| Axillay | 165 | 49.6 |
| Anus | 6 | 1.8 |
| **What body temperature do you worry about?** | | |
| 37°C and below | 6 | 1.8 |
| 37.1–37.9°C | 60 | 17.5 |
| 38–38.9°C | 192 | 56.1 |
| 39°C or above | 84 | 24.6 |
| **How often do you check your child's temperature when they have a fever?*** | | |
| 15-min intervals | 142 | 43.2 |
| 30-min intervals | 102 | 31.0 |
| 1-h intervals | 21 | 6.4 |
| 2-h intervals | 7 | 2.1 |
| Other | 57 | 17.3 |
| **Where do you first go when your child has a fever?*** | | |
| Family health center | 126 | 38.3 |
| Public hospital | 109 | 33.1 |
| Private hospital | 73 | 22.2 |
| University hospital | 15 | 4.6 |
| Other | 6 | 1.8 |
| **When do you go to your doctor when your child has a fever?*** | | |
| The first day | 176 | 53.5 |
| The second day | 121 | 36.8 |
| The third day and after | 32 | 9.7 |
| **Where do you get help or information when your child has a fever?*** | | |
| Internet | 71 | 21.6 |
| Newspaper/magazine | 1 | 0.3 |
| Neighbors | 25 | 7.6 |
| Nurses/healthcare professionals | 46 | 14.0 |
| Doctor | 127 | 38.6 |
| Other | 59 | 17.9 |

*Mothers with their first child who is under five years of age have not experienced fever before.

**Table 4:** Comparison of sociodemographic characteristics and Parental Fever Management Scale

| | PFMS-TR | | t | p* |
|---|---|---|---|---|
| | Mean±SD | (Min-Max) | | |
| **Maternal age** | | | | |
| ≥30 years | 35.3±3.0 | 26-40 | 0.766 | 0.444 |
| <30 years | 35.0±3.7 | 14-40 | | |
| **Age at marriage** | | | | |
| ≥21 years | 35.6±3.1 | 24-40 | 2.115 | **0.035** |
| <21 years | 34.7±3.6 | 14-40 | | |
| **Age of first birth** | | | | |
| ≥22 years | 35.5±3.2 | 24-40 | 1.939 | 0.053 |
| <22 years | 34.8±3.6 | 14-40 | | |
| **Employment status** | | | | |
| Employed | 35.5±3.5 | 26-40 | 0.936 | 0.350 |
| Unemployed | 35.1±3.3 | 14-40 | | |
| **Consanguinity with spouse** | | | | |
| Yes | 35.4±3.3 | 24-40 | 0.386 | 0.699 |
| No | 35.1±3.4 | 14-40 | | |
| **Presence of deceased children** | | | | |
| Yes | 34.2±4.2 | 26-39 | -0.990 | 0.323 |
| No | 35.2±3.3 | 14-40 | | |
| **Planned pregnancy** | | | | |
| Yes | 35.4±3.1 | 24-40 | 2.078 | **0.039** |
| No | 34.5±4.1 | 14-40 | | |
| **Caregiver** | | | | |
| Yes | 34.9±3.2 | 27-40 | -0.380 | 0.704 |
| No | 35.2±3.4 | 14-40 | | |
| **Education status** | | | | |
| ≤Middle school educated | 34.8±3.4 | 14-40 | -2.215 | **0.027** |
| ≥High school educated | 35.6±3.3 | 24-40 | | |
| **Marital status** | | | | |
| Married | 35.2±3.4 | 14-40 | -0.119 | 0.905 |
| Unmarried | 35.3±2.7 | 31-39 | | |
| **Longest place of residence** | | | | |
| Center | 35.3±3.0 | 27-40 | 2.227 | **0.027** |
| District and villages | 34.2±4.8 | 14-40 | | |
| **Number of births** | | | | |
| < 2 delivery | 35.1±3.1 | 24-40 | 0.014 | 0.628 |
| ≥2 delivery | 35.3±4.1 | 14-40 | | |
| **Family type** | | | | |
| Nuclear family | 35.1±3.4 | 14-40 | -0.339 | 0.735 |
| Extended/fragmented family | 35.3±3.2 | 24-40 | | |
| **Smoking status** | | | | |
| Current smoking | 35.0±3.3 | 27-40 | -0.292 | 0.770 |
| Not smoking | 35.2±3.4 | 14-40 | | |

PFMS-TR: Parental Fever Management Scale, SD: Standard deviatio,n *Used Student-t test

**Table 5:** Comparison of demographic characteristics and Rational Drug Use Scale (RDUS)

| | RDUS≥36.5 (sufficient knowledge) | | RDUS<36.5 (insufficient knowledge) | | Total | | $\chi^2$ | p |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | | |
| **Maternal age** | | | | | | | | |
| ≥30 years | 106 | 58.2 | 76 | 41.8 | 182 | 100.0 | 2.331 | 0.127 |
| <30 years | 80 | 50.0 | 80 | 50.0 | 160 | 100.0 | | |
| **Age at marriage** | | | | | | | | |
| ≥21 years | 110 | 61.5 | 69 | 38.5 | 179 | 100.0 | 7.560 | **0.006** |
| <21 years | 76 | 46.6 | 87 | 53.4 | 163 | 100.0 | | |
| **Age of first birth** | | | | | | | | |
| ≥22 years | 118 | 60.5 | 77 | 39.5 | 195 | 100.0 | 6.865 | **0.009** |
| <22 years | 68 | 46.3 | 79 | 53.7 | 147 | 100.0 | | |
| **Employment status** | | | | | | | | |
| Employed | 49 | 81.7 | 11 | 18.3 | 60 | 100.0 | 21.830 | **<0.001** |
| Unemployed | 137 | 48.6 | 145 | 51.4 | 282 | 100.0 | | |
| **Consanguinity with spouse** | | | | | | | | |
| Yes | 13 | 37.1 | 22 | 62.9 | 35 | 100.0 | 3.931 | **0.047** |
| No | 173 | 56.4 | 134 | 43.6 | 307 | 100.0 | | |
| **Presence of deceased children** | | | | | | | | |
| Yes | 4 | 36.4 | 7 | 63.6 | 11 | 100.0 | 0.832 | 0.223 |
| No | 182 | 55.0 | 149 | 45.0 | 331 | 100.0 | | |
| **Caregiver** | | | | | | | | |
| Yes | 18 | 78.3 | 5 | 21.7 | 23 | 100.0 | 4.681 | **0.030** |
| No | 168 | 52.7 | 151 | 47.3 | 319 | 100.0 | | |
| **Education status** | | | | | | | | |
| ≤Middle school | 65 | 38.5 | 104 | 61.5 | 169 | 100.0 | 34.151 | **<0.001** |
| ≥High school | 121 | 69.9 | 52 | 30.1 | 173 | 100.0 | | |
| **Longest living place** | | | | | | | | |
| Center | 168 | 57.9 | 122 | 42.1 | 290 | 100.0 | 8.745 | **0.003** |
| District and villages | 18 | 34.6 | 34 | 65.4 | 52 | 100.0 | | |
| **Number of births** | | | | | | | | |
| < 2 delivery | 124 | 52.1 | 114 | 47.9 | 238 | 100.0 | 1.647 | 0.199 |
| ≥2 delivery | 62 | 59.6 | 42 | 40.4 | 104 | 100.0 | | |
| **Family type** | | | | | | | | |
| Nuclear family | 158 | 58.1 | 114 | 41.9 | 272 | 100.0 | 7.343 | **0.007** |
| Extended/fragmented family | 28 | 40.0 | 42 | 60.0 | 70 | 100.0 | | |
| **Economic situation** | | | | | | | | |
| Economic income less than expenses | 40 | 40.4 | 59 | 59.6 | 99 | 100.0 | 10.998 | **0.004** |
| Economic income equivalent to expenses | 111 | 60.3 | 73 | 39.7 | 184 | 100.0 | | |
| Economic income over expenses | 35 | 59.3 | 24 | 40.7 | 59 | 100.0 | | |
| **Presence of thermometer at home** | | | | | | | | |
| Yes | 170 | 55.6 | 136 | 44.4 | 306 | 100.0 | 1.186 | 0.276 |
| No | 16 | 44.4 | 20 | 55.6 | 36 | 100.0 | | |
| **Reading prospectus** | | | | | | | | |
| Yes | 172 | 95.0 | 9 | 5.0 | 181 | 100.0 | 14.719 | **<0.001** |
| No | 124 | 81.0 | 29 | 19.0 | 153 | 100.0 | | |

RDUS: Rational Drug Use Scale

**Table 6:** Correlation of some parameters with PFMS and RDUS

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| **1. Maternal age** | r | 1 | | | | | |
| | p | | | | | | |
| **2. Age at marriage** | r | 0.191** | 1 | | | | |
| | p | **0.000** | | | | | |
| **3. Age of first birth** | r | 0.232** | 0.922** | 1 | | | |
| | p | **0.000** | **0.000** | | | | |
| **4. Number of births** | r | 0.643** | -0.385** | -0.405** | 1 | | |
| | p | **0.000** | **0.000** | **0.000** | | | |
| **5. PFMS total score** | r | 0.086 | 0.155** | 0.165** | -0.059 | 1 | |
| | p | 0.119 | **0.005** | **0.003** | 0.290 | | |
| **6. RDUS total score** | r | -0.044 | 0.167** | 0.124* | -0.097 | 0.138* | 1 |
| | p | 0.418 | **0.002** | **0.022** | 0.073 | **0.012** | |

*: Correlation is important at the 0.05 level, **: Correlation is important at the 0.01 level, RDUS: Rational Drug Use Scale, PFMS: Parental Fever Management Scale
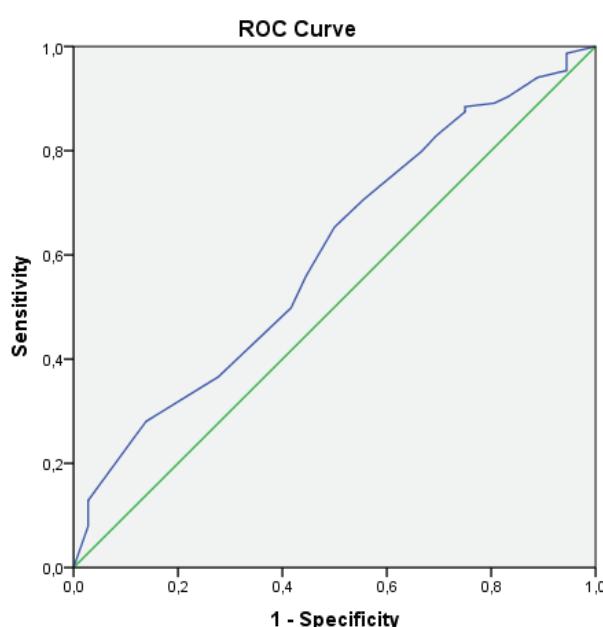


**Figure 1:** ROC Curve of rational drug use scale

## DISCUSSION

An increasing body temperature of their children is one of the most important situations that make parents anxious. In this presented study, fever management and RDU were investigated in the parents of children between 0 and 5 years of age who were most affected by this condition. In a study evaluating 132,654 patients in Ankara, 22.3% of the complaints made by patients who applied to the pediatric emergency services were found to be fever (15). As fever rises in their children, anxiety, fear and helplessness increase in parents (10). The ignorance of parents about when and how to intervene with their febrile child, leads to the child being exposed to unnecessary practices, and the use of antibiotics and unnecessary or incorrect doses of antipyretics.

In the presented study, the average age at marriage was 21.44±3.5 years and the mean age at first birth was 23.1±3.8 years. In 2020, the average age at first marriage was 25.1 years for women, and the average age at first birth for mothers was 26.5 years in Turkiye. Age at first marriage and age at first birth were also consistent with TUIK data (19). This research; the fact that such a study has not been done before in the city center where the study was conducted, was valuable in terms of the fact that the study was conducted in primary care and emphases the importance of fever management and rational drug use in our country.

It has been observed that today, more mothers live in the city center, within a nuclear family structure. While this does not make a difference in the management of attitudes and behaviors towards fever, it makes a difference with regards to RDU. The increase in the rational use of drugs is pleasing. The rates of mothers who know the normal body temperature in the literature were reported as between 34.3% and 67% (9, 20). In this study, 80% of the mothers knew the normal body temperature. It was observed that those who knew the normal body temperature administered the drugs rationally. It was gratifying that the majority of mothers knew the normal body temperature.

It was found that more than 80% of the participants were worried if or when the temperature of their child was

≥38°C. Col-Araz and Poirier et al. reported similar results (9, 10). As seen in the reported study, it was clear that the increase in body temperature caused anxiety in the mothers.

While the vast majority of the participants had a thermometer in their homes, it was interesting to note that only 12% of them used it to understand if their children had a fever. In a similar study in the literature, the rate of having a thermometer at home was determined as 26% (9). Although mothers were careful to have a thermometer in their homes, they preferred to check the body temperature of the child by touching them, as a learned behavior. In their study investigating the usability of touch as a screening method of fever, Charturvedi et al. reported that fever detection via touch was not a reliable method, it was deceptive, and it would be healthier to use a reliable thermometer for detection (21). It was believed that the use of the fever measurement method with palpation, which causes mothers to perceive that the body temperature is higher, can reduce the use of unnecessary drugs to reduce fever.

In this presented study, 50% of the mothers measured fever under the arm (axillary) and 44% measured from the forehead. In addition to the increase in the variety of thermometers, as well as the increase in urbanization and education, axillary fever measurement, as well as forehead and ear measurement, made temperature taking easy and feasible for the mothers.

Frequent fever in children increases the experience that mothers have with fever management. In this research, it was found that one-third of the children got a fever 1–2 times a year and one-third got a fever 3–4 times a year. Turker et al. reported that the rate of children fired 1-3 times a year was 19.6%, 36.9% and 20.6%, respectively (22). As seen in the literature and in the current study, fever is a common complaint and can become a cause of fear for families with young children and result in incorrect practices. Frequent fever in children worries the mothers and significantly increases the frequency of fever control.

In the research of Hiller et al., 65% of the participants defined fever as useless and 55% defined it as harmful (23). In the literature, as in the current study, it is known that the majority of parents think that fever is harmful to the child and that the most feared situation is the fever convulsions (9, 24).

In various studies, it has been reported that the first application of mothers for febrile children was to apply warm water, remove their clothes, and use antipyretic drugs (6, 9). In the study presented, removing the clothes, warm water application/having a shower, or giving a fever-reducing drug/suppository were among the most preferred antipyretic methods. In children, incorrect or ineffective applications during high fever can cause serious complications. The positive effect of rapidly increasing urbanization rates was not seen here. It is of concern that not combining traditional practices with appropriate modern medical knowledge in Turkiye can be dangerous.

In the study of Turker et al., a significant portion of the mothers reported that they applied to health centers within the first day after their child had a fever (22). It was obvious that the families took them to the health center immediately, and the importance of the primary health center was emphasized once again, as it was the closest health institution in terms of transportation and time.

When the mothers were asked who/where they got medical help when their child had a fever, it was significant that more than half went to doctors or nurses/ healthcare professionals, with a considerable amount who searched on the internet, and a few reported that they received help from newspapers/magazines or neighbors. In the study of Chang et al., 80% of the parents stated that they received medical help from doctors and nurses, 50% from books/newspapers/magazines, and 37% from television and radio (20). It was clear that mothers need health education in this regard in order to monitor the developing fever in a healthy way and get the right treatment from the right place. It was obvious that media sources, such as the internet and television, are used by mothers as a guide. For this reason, it must be only updated by healthcare professionals, and there is a need for internet software and TV programs, which are more scientific and closed to interpretation.

As in a similar study in the literature, 1 of 3 people kept the drugs and/or discharged in relation to the increasing drugs after the end of treatment. People continue to keep medicines with the logic that they may be needed in the future. While half of the participants kept the drugs in the refrigerator, one-third preferred a cool and closed cabinet. Karatas et al. also obtained similar results to their study (25). It was remarkable that individuals stored the drugs incorrectly, such as storing every medicine in the refrigerator or storing the remaining drugs at home for many years and using expired drugs. It is our belief that the doctor, nurse, or pharmacist in contact with the patient should warn the patient about the correct storage conditions.

Similar to the current study, Hew et al. found high scores on the PFMS and showed that the care burden of the parents was very high in the monitoring of febrile children (26). In different countries similar to Turkiye, it was found that parents were very afraid of fever and frequently checked their children during fever follow-up and treatment (27-29). In a population-based study conducted by

Hew et al. in Malaysia, high PFMS total scores were obtained in parents. While mothers were fighting fire; they generally aimed to administer antipyretics (81.4%), to monitor temperature (86.0%), and to comply with medical advice (69.8%) (29). However, in Australia, parents were found to be delayed in taking their children to the doctor in the case of fever (28). In contrast, in the current study, mothers worried when their children had a fever, spent most of their time with their children, and made efforts to lower the fever. There is a serious responsibility of pediatricians, family physicians, and family health personnel who frequently encounter febrile children, to inform parents in order to alleviate the care burden of parents and increase their knowledge.

Ozatik et al., in their study, conducted a questionnaire before and after education with 300 university students, and observed a significant improvement in the RDUS knowledge levels with education (30). In the studies of Bertille and Anokye, it was found that as the education level of the mothers increased, the compliance of the mothers with the positive suggestions was higher when their children had a fever (6, 31). The positive impact of education on knowledge is known, providing accurate information on fever management and rational use of drugs through public spotlight, public education, or media to raise public awareness will significantly reduce the mistakes that mothers make when administering drugs to their febrile children.

### Limitations

The lack of questions, such as whether the expiration dates of the drugs stored at home were checked, which drug was given as an antipyretic, dose intervals, and how they adjusted the dose were among the limitations of this study.

One of the most important limitations of our study suggests that the questionnaire and its lack of open-ended questions, led to the participants being hesitant with the researcher and hiding some information during the face-to-face interviews.

### CONCLUSION

It was found that 64% of the children under the age of five had fever at least four times a year. It was seen that the majority of mothers checked their febrile children with intervals of 15 minutes and generally preferred to go to a FHC on the first day. Fever is a common symptom in children and causes anxiety and stress in families. Parents turn to health centers or medicines without wasting time. Family physicians should inform the mother of the febrile child about how they should approach the situation, and the family will be comforted and health care institutions will reduce unnecessary applications.

In addition, with the Ministry of Health, larger masses should be targeted using posters, public spots, or media. According to the family medicine system implemented in Turkiye, FHCs are the centers that citizens can reach the easiest. The financial losses paid due to incorrect drug use will be prevented and it will be possible to contribute to the economy and health by carefully diagnosing the patients, determining the rational treatment options, writing an appropriate prescription, and informing the patient sufficiently.

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