

**Parent's attitude, knowledge and Belief of Child's Fever managements in Al-Qassim  
- Saudi Arabia**

**Abstract:**

**Background:** Parent's misconception of fever result in increased anxiety and antipyretics are commonly used in this situation, so any lack of parent's knowledge regarding strategies of using them raises the possibility of drug-related problems.

**Objective:** This study evaluated the parents' knowledge, attitude and beliefs in dealing with the children's fever.

**Methods:** An ethically approved cross-sectional study was conducted in Qassim region -Saudi Arabia.

**Results:** A total of 490 parents were participated in this study, 83.7% of them were mothers. Half of parents use the armpit site for measuring temperature. The majority of parents considered the temperature  $\leq 37$  °C as normal and more than half of them considered  $\geq 38$  °C as fever temperature. Convulsion was believed to be a complication of fever in 71% of parents and there was a significant association between the number of children and the practice of giving antipyretics. A wrong practice of assessing fever was using hand touch, and this study revealed that this behavioral was presented in a nearly third of parents. Acetaminophen was the commonly used antipyretics beside ice packs as a common non pharmacological therapy. The study also showed the majority of parents didn't know the importance of weight in considering antipyretic.

**Conclusion:** In over of all, parents participated in this study have inadequate knowledge about fever, its assessment and decision of giving a medication. However, past experiences and the number of sibling highly influence their practice and knowledge. Therefore, there is a need of effort to maximize parents' information and awareness about fever.

**Keywords:** Children, Fever, Parents, Saudi Arabia

32 **Introduction**

33 Fever is one of the most common causes of visiting the doctor [1] and it is up to 20% of children  
34 in pediatric emergency presented with fever [2]. Since 1980, it has been perceived that parents in Europe  
35 and North America have different and unrealistic fears about fever. Parents' misconceptions and anxiety  
36 'fever phobia' was first examined and reported by Schmitt in 1980 [3].

37 A study was conducted in the United States (USA), showed that 57% of parents were very  
38 worried about the harmful effect of fever on their children [4]. Phobia of fever has been shown to affect  
39 the parents' decisions regarding seeking medical care [5]. Although parents perceive fear from fever,  
40 they have poor knowledge of fever and its consequences [6]. In 2000, a study was performed in Saudi  
41 Arabia reported that, more than two third of parents have a poor understanding of fever, high fever,  
42 untreated fever with maximum temperature, and threshold temperature which justifies the use of  
43 antipyretic medications [7].

44 Parents have different beliefs about the reliable method in assessing the body temperature of  
45 their children. In Kuwait two third of mothers use a touch practice and general look of child as fever  
46 determination [8]. While, measuring the temperature by thermometer considered as the most accurate  
47 way to identify fever and decreases human variability and errors. The body is considered to be feverish  
48 when the rectal temperature records more than 38 (Celsius) °C, oral temperature exceeds 37.8 °C, and  
49 auxiliary temperature above 37.4 °C [9].

50 The standard methods of fever control consist of antipyretic drug therapy and external physical  
51 cooling, including cooling blankets, ice packs, tepid water sponge baths [10]. The use of antipyretics by  
52 the parents' is a favored strategy to manage fever in children <sup>11</sup>. However, current World Health  
53 Organization (WHO) guidelines on the management of fever recommends that children with a body  
54 temperature of more than 38.5°C with a mild to moderate rise, should not be routinely suppressed by  
55 antipyretics <sup>12</sup>. The extensive use of antipyretic could lead to an increase accidental overdosing [13].

56 As the Saudi parents' attitude and knowledge towards childhood fever were minimally  
57 addressed, so, this study targeted the parent's beliefs and knowledge about fever and its management in  
58 children at age under 12 years in the Qassim region in Saudi Arabia with an aim to enable health  
59 professionals to focus on the ideal way of educating parents regarding fever management.

60 **Methods:**

61 **Study design and area:**

62 An observational, survey-based, cross-sectional study was conducted with a convenience sample  
63 of Saudi parents in the Qassim region from March 2018 to April 2018. The study followed the  
64 regulations of the national Ethical committee and it was approved by Qassim University ethical  
65 committee. The data were collected from three major cities in the Qassim region; Buraydah, Onaizah  
66 and Alrass. The survey was distributed in both male and female elementary schools as they include  
67 heterogenic type of population. The study included all parents of children aged from 1-12 years with  
68 exclusion of healthcare professionals in order to reduce the bias. A signed consent covering all the  
69 important points regarding the research was obtained before the survey. The survey was divided into  
70 demographic characteristics section which included questions related to age, gender, children's number,  
71 marital status, employment and the availability of health care insurance.

72 The second section of the survey included questions regarding parents' knowledge and beliefs  
73 about fever. The third section included the parents' attitude and practices regarding fever.  
74 The sample size was 490 and it was calculated using G\*Power software program (version 3.1.9) Three  
75 level of effect size was taken into consideration according to Cohen in 1988. The medium level was  
76 used as it is mostly used in literature.

77 The questionnaire was validated using test-retest reliability, 10 participants were randomly  
78 selected and asked to fill the questionnaire two times two weeks apart. The test-retest data was analyzed  
79 on each item using correlation coefficients for each item to ensure that questionnaire is reliable.

## 80 **Statistical Analysis**

81 Descriptive statistics (Frequencies, Percentages, Mean, and Standard deviation), chi-square test  
82 to compare frequencies, Fisher exact test in cases of frequencies that equal to five or less were used in  
83 the analysis of these results. Moreover, unpaired t-test to compare the means for the continuous  
84 variables such as age was also used. The statistical analysis was performed at a significance level of  
85 0.05 using SAS University Edition (SAS Institute Inc., Carey, North Carolina).

## 86 **Results**

### 87 **Demographic characteristics of the study population:**

88 A total of 490 parents was completed the questionnaire, 83.7% of them were mothers. The mean age of  
89 participants was 38.6 ( $\pm$  6.8) years. All most all of them (98.2%) were married and only 1.2% were  
90 divorced and 0.6% were widowed. The majority of parents (71.8%) were employed and nearly two  
91 thirds (64.7%) of them have a university degree. Interestingly ~50% of the population had three to five  
92 children. (Table. 1)

93 **Table (1) Demographic characteristics of the study population (n = 490)**

Characteristics	Frequency	Percentage
<b>Gender</b>		
Male	80	16.3%
Female	410	83.7%
<b>Marital status</b>		
Married	481	98.2%
Divorced	6	1.2%
Widowed	3	0.6%
<b>Education level</b>		
Elementary school	34	6.9%
Less than high school	25	5.1%
High school	94	19.2%
College and university degree	317	64.7%
Graduate degree( master, PhD)	20	4.1%
<b>Insurance</b>		
Yes	100	20.4 %
No	390	79.6%
<b>Number of children</b>		
≤2	139	28.3%
3 to 5	249	50.8%
≥6	102	20.8%

94

95 **Parents' beliefs about fever and its management:**

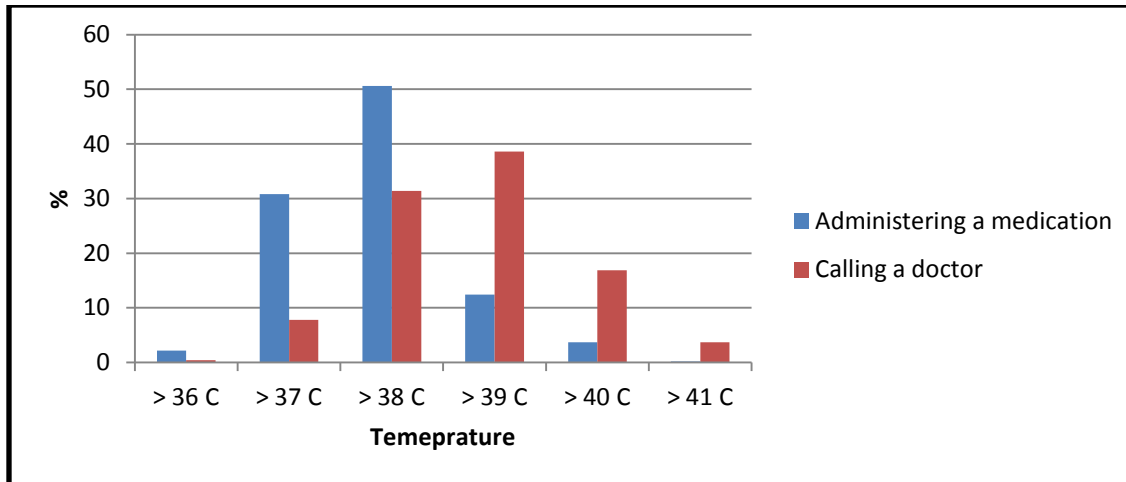
96 In this study, nearly half of parents considered the armpit as the most common place to measure  
 97 temperature followed by ear and mouth. About 43% of parents considered 37°C as the normal body  
 98 temperature and 36.5°C was considered in 20.4% of parents. While only 11.6% of parents chosen 37.5  
 99 °C as the normal temperature. Besides that, 45% of parents considered a fever in their children when  
 100 their temperature measured 38°C and 38.0% of parents considered 37°C as fever. The study also showed  
 101 that, most of the parents (71%) thought that fever may cause Seizure / convulsion and 10% of  
 102 respondents reported that the fever might cause brain damage if not  
 103 controlled and dehydration was selected as complication in 4.9% of parents. (Table. 2)  
 104 In Figure.1, most parents gave their children treatment for fever when the temperature was more than  
 105 38°C and 38.6% of them would call the doctors when child fever reached 39°C followed by 31.4% at  
 106 38°C.

107 Table 3 summarized the results of the bivariate analysis of giving a medication. Significantly more  
 108 parents who have < 6 children had reported giving medication when a temperature read  $\leq 37^{\circ}\text{C}$  than  $\geq$   
 109  $38^{\circ}\text{C}$  ( $P = 0.011$ ).

110 **Table (2) Beliefs about fever as reported by parents (n=490)**

Variable	Frequency	Percentage	
<b>Beliefs about the best place where temperature is measured</b>	The mouth	55	11.2%
	The armpit (axilla)	241	49.2%
	The rectum (bottom)	3	0.6%
	The ear	169	34.5%
	I do not know	22	4.5%
<b>Beliefs about the normal body temperature</b>	$35^{\circ}\text{C}$	21	4.3%
	$35.5^{\circ}\text{C}$	14	2.9%
	$36^{\circ}\text{C}$	77	15.7%
	$36.5^{\circ}\text{C}$	100	20.4%
	$37^{\circ}\text{C}$	210	42.9%
	$37.5^{\circ}\text{C}$	57	11.6%
	$38^{\circ}\text{C}$	6	1.3%
	38.5	1	0.2%
	$39^{\circ}\text{C}$	0	0
	$39.5^{\circ}\text{C}$	1	0.2%
	$\geq 40^{\circ}\text{C}$	0	0
I don't know	1	0.2%	
<b>Beliefs about the fever temperature</b>	$36^{\circ}\text{C}$	19	3.9%
	$37^{\circ}\text{C}$	186	38.0%
	$38^{\circ}\text{C}$	222	45.3%
	$39^{\circ}\text{C}$	39	8.0%
	$40^{\circ}\text{C}$	21	4.3%
	$41^{\circ}\text{C}$	3	0.6%
<b>Beliefs about the complications of fever</b>	Seizure	348	71.0%
	Brain damage	50	10.2%
	Death	8	1.6 %
	Dehydration	24	4.9 %
	Coma	22	4.5 %
	Nothing will happen	10	2.0 %
	I don't know	28	5.7%

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114 **Figure (1) Parents' response to fever; when to administer medication and when to call for doctor**  
 115 **(n = 490)**

116

117 **Table (3) Association between number of children and practice of parent's for giving fever**  
 118 **lowering drug. (n = 490)**

		Number of children				P-value
		< 6		≥ 6		
		f	%	f	%	
Giving medication when a temperature	≤ 37	139	35.8%	23	22.5%	0.011*
	≥ 38	249	64.2%	79	77.5%	

119

120 **Parents' methods in managing Fever:**

121 In this study, approximately a third of parents (31.8%) used to use their hands in assessing their  
 122 children's temperature while, 28.6% of them used electronic thermometer and 26.5 % used a tympanic  
 123 thermometer. 38.4% of the parents check the temperature each 15 to 30 minutes. The most commonly  
 124 used drug was acetaminophen in 96.9% and about 14.7% of the parents, they used antibiotics in addition  
 125 to acetaminophen (with/without medical advice). Regarding to the non-pharmacological therapy, the ice  
 126 pack was the most commonly used by parents (62.7%) followed by tepid sponging in (23.3%). 62.4% of  
 127 the parents were given the medications orally, whereas 36.9% of the parents given by rectal route. In  
 128 addition, 78.4% of the participants used a specific measuring spoon or syringe of the drug for giving the  
 129 medication. (Table 4)

130 **Table (4) Parent’s methods in managing childhood fever (n = 490)**

Variables	f	%	
<b>Methods to measure the temperature</b>	Hand	156	31.8 %
	Electronic thermometer	140	28.6 %
	Mercury-in-glass thermometer	41	8.4 %
	Tympanic (Ear) thermometer	130	26.5 %
	Skin infrared thermometer	8	1.6%
	Plastic strip placed on forehead	4	0.8 %
	I do not check my child’s temperature	10	2.0%
	I do not know	1	0.2%
<b>Frequency of measuring the temperature, every:</b>	Less than 15 minutes	81	16.5%
	From 15 to 30 minutes	188	38.4 %
	From 30 minutes to 1 hour	115	23.5 %
	From 1 to 2 hours	79	16.1 %
	More than 2 hours	27	5.5 %
<b>Drug administered for fever</b>	Acetaminophen	475	96.9 %
	Ibuprofen	48	9.8%
	Aspirin	0	0 %
	Antibiotics	72	14.7%
<b>Remedies used in addition to drugs</b>	Cold sponging	25	5.1%
	Ice pack	307	62.8%
	Tepid sponging	114	23.3%
	I use drugs only	25	5.1%
	Other	18	3.7%
<b>Site of medication administration</b>	Orally	306	62.4%
	Rectally	181	36.9%
	Injection	3	0.6%
<b>Instrument used to administer the Medication</b>	Regular tablespoon or teaspoon	37	7.6%
	Specific measuring spoon or syringe of the drug	384	78.4%
	Measuring spoon or syringe of other drug	69	14.1%

131

132 **Parents’ practices in managing Fever:**

133 Two thirds of parents followed the previous advice from the pediatrician in selecting the right  
 134 fever lowering drug and 46% of parents followed the same thing in calculating the dose. Approximately  
 135 half of parents (47.3%) considered the age of the child when giving fever lowering drugs then followed  
 136 by the severity of fever (29.4%) and only a 19% had considered the dosing of antipyretic based on the  
 137 weight. (Table 5)

138 **Table (4) Parent’s practices in managing childhood fever (n = 490)**

Variables	Frequency	%	
<b>The right fever lowering drug would be decided by</b>	Previous advice from the pediatrician	328	66.9%
	Consulting the pharmacist	12	2.4%
	Consulting other persons	5	1.0%
	Information gathered by media	77	15.7%

	I decide by myself what I think is right	15	3.1%
	I call my pediatrician	41	8.4%
	Other	12	2.4%
<b>The right dose of fever-lowering drug would be decided by</b>	Previous advice from the pediatrician	225	46%
	Reading the package leaflet	135	28%
	Consulting the pharmacist	64	13%
	Consulting other persons	3	0.6%
	Information gathered by media	0	0%
	I decide by myself what I think is right	18	3.7%
	I call my pediatrician	39	8%
	Other	6	1.2%
<b>To give a fever lowering drug, you Consider</b>	Age	232	47.3%
	Sex	2	.4%
	Weight	93	19.0%
	Height	2	0.4%
	Severity of fever	144	29.4%
	Severity of illness	17	3.5%

139

140 **The parents' practice of obtaining and using antibiotics:**

141 In illustrating the reasons of giving antibiotics to febrile child, 62% of parents depend on  
 142 physicians or a medical prescription, while, 28% reported that they used it whenever they suspected  
 143 infection. Only 9.6% of the parents insisted on prescribing antibiotics to their children, even if it was not  
 144 considered necessary by the doctor. Only 10% believed that antibiotic should be prescribed to all  
 145 children who developed fever.

146 **Table (5) The parents' practice in obtaining and using antibiotics.(n = 490)**

Variables		frequency	%
<b>Reason of giving an antibiotic drug for child</b>	He/she has a fever	38	7.8%
	You suspect an infection	138	28.2%
	The physician said to give him/her or through a medical prescription	304	62.0%
	A friend suggestion	3	.6%
	A relative suggestion	2	.4%
	Found information on the Internet, TV, or papers about its benefits	5	1.0%
	In all the cases above	38	7.8%
<b>Insisting in prescribing antibiotics to child even if the doctor didn't consider it necessary</b>	Yes	47	9.6%
	No	443	90.4%
<b>All children who develop fever the antibiotics should be</b>	Yes	49	10.0%
	No	441	90.0%



**Discussion**

This study evaluated the parents' knowledge, beliefs and practice regarding childhood fever in Qassim region. A total of 490 parents were participated in this study with a response rate of 96 %, which was beyond the usual expected response rate as the reported average response rate for paper-based surveys is 56% with a range between 32.6% to 75% [14]. Most of the participants were mothers (83.7%). The majority of parents were educated with college and university degree which reflect the development in higher education in Saudi Arabia.

In this study the parents' beliefs about fever showed that half of them (49.2%) considered the armpit as the favorite site for measuring body temperature and 34.5% of them considered the ear while, 11.2 % of parents have considered the mouth. These results were largely affected by the marketed devices used in measuring body temperature and the easy usage and access to the site. However, in another study, 50% of participants use the mouth [15]. Many of parents considered 37 °C and 36.5°C as normal temperature. These findings were similar to another study conducted in Taiwan, which showed that 67% of participants considered  $\leq 37^{\circ}\text{C}$  as normal body temperature [16]. Although 45.3% of parents defined fever at 38°C, 38% of them believed that 37°C is the temperature of a fever. This reflected the lower level knowledge to define fever. Most of the parents had a concern from seizure/convulsion as a harmful consequence of fever, others had concern from brain damage and dehydration.

The findings of this study were similar to the study of Jalil HA, Jumah NA, Al-Baghli AA, which reported that most of parents considered seizures as side effect of fever [8]. In study conducted by Zyoud et al., showed a high percentage of parents had concern of brain damage (38.1%) as complication of fever while in this study only 10.2% reported this [15]. An excessive scare from fever and the bad consequence of it , may lead to increase the monitoring frequency of administration of medication [3]. As recommended in guideline antipyretic should be given when the fever temperature is  $>38^{\circ}\text{C}$ . However, in this study the parents used to give the antipyretic when fever temperature is 38 °C and less. This properly may indicate overuse of antipyretic medication for childhood fever. A significantly parents who have  $\geq 6$  children used to give their child medication when the temperature is  $\geq 38^{\circ}\text{C}$ , this may be explained by more experience for determining the fever temperature from previous incidences and less concern regarding complication. A previous study reported that when a child grow up parents would have experience with resultant less fever concern [17].

179 Although nearly a third of parents they use their hands in assessing their children's' temperature,  
180 which is not a recommended method as it has a wrong assessment of fever with subjective variation.  
181 About (28.6%) of parents use electronic thermometer and up to 26.5 % of parents use tympanic  
182 thermometer. The electronic assessment is the most accurate and easiest method to measure the  
183 temperature at home. More than third of parents (38.4%) check the child's temperature from 15 to 30  
184 minutes. As reported by Crocetti. et al., about half of parents measure their child's temperature every  
185 one hour and less, which reflect the increased levels of parent's careful and worriness [18]. The most  
186 commonly antipyretic is acetaminophen, which was represented in 96.9%.

187 This finding aligns with other study findings, but in contrast to what they reported that a high  
188 percent of parents alternated to other antipyretic, in this study actually a high percent of parents not  
189 alternated to other antipyretics [19]. In addition to medication the ice pack was the most commonly used  
190 non pharmacological therapy (62.7%) followed by tepid sponging (23.3 %) a similar finding was  
191 reported in Badawy NAK, Alhajraf AF and Alsamdan MF study.<sup>19</sup> As stated in another study, the  
192 bathing is not effective and cause shivering which may increase the temperature as a result of the  
193 decrease a temperature by sponging [8].

194 The oral route was the most commonly used routes for administering the medication (62.4%),  
195 followed by the rectal route (36.9%). This finding was similar to a previous study which found that  
196 about half of participants use oral route [15] The rectal route may be the most convenient rout of  
197 management of babies. Significantly fathers have a practice of giving a medication by mouth more than  
198 mothers, this may be related to the fact that fathers take care of children at large age than mothers who  
199 take care for younger children. The majority of parents (78.4%) uses specific measuring spoon or  
200 syringe of the drug for giving the medication.

201 Large percentages of parents decide the right drug (66.9%) and calculate the dose (46%) based  
202 on previous advice from a pediatrician. Approximately half of parents (47.3%) consider the age of the  
203 child when giving antipyretic drugs then followed by the severity of fever (29.4%) and only a 19%  
204 considering the weight, which indicated a lack of awareness regarding the importance of considering the  
205 weight when giving fever lower drugs. The interesting finding is that parents have a good awareness  
206 about using antibiotics. Among 14.7% of antibiotics used 62.0% of parents used them based on physician  
207 prescription.

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209

210 **Limitation:**

211 Although cross-section study is a convenient method, but it lacks proof of causality because it  
212 was collected in one period of time. Second, the study was performed using a convenience sample  
213 technique. This method is known as non-probability sampling technique. However, we used this method  
214 because we have no control over schools to participate. Third, we conducted this study using a  
215 questionnaire in a written ancient Arabic language. Thus, some uneducated parents may face some  
216 reading difficulties. Therefore, this might affect their participation or understanding of the questioner.  
217 Lastly, this result will be generalized only to a similar population.

218 **Conclusion:**

219 In over of all, the most participated parents were mothers and this reflects their major  
220 responsibility of care for children. parents have inadequate knowledge about fever, its assessment and  
221 decision of giving a medication. Despite their high education level, " fever phobia" is widespread among  
222 parents. However, the number of sibling and past experiences highly influence their practice. So, a need  
223 of effort to maximize parents' information and awareness of fever is crucial especially for new parents.  
224

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