

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 ≤ 37 °C as normal and more than half of them considered ≥ 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: Over 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 [11]. 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 [12]. 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 **Materials and Method:**

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 data were collected from
64 three major cities in the Qassim region; Buraydah, Onaizah and Alrass. The survey was distributed in
65 both male and female elementary schools as they include heterogenic type of population. The study
66 included all parents of children aged from 1-12 years with exclusion of healthcare professionals in order
67 to reduce the bias. A signed consent covering all the important points regarding the research was
68 obtained before the survey. The survey was divided into demographic characteristics section which
69 included questions related to age, gender, children's number, marital status, employment and the
70 availability of health care insurance.

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

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

79 **Statistical Analysis**

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

85 **Results**

86 **Demographic characteristics of the study population:**

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

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

Characteristics	Frequency	Percentage (%)
Gender		
Male	80	16.3
Female	410	83.7
Marital status		
Married	481	98.2
Divorced	6	1.2
Widowed	3	0.6
Education level		
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
Insurance		
Yes	100	20.4
No	390	79.6
Number of children		
≤2	139	28.3
3 to 5	249	50.8
≥6	102	20.8

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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 controlled and dehydration was
 103 selected as complication in 4.9% of parents. (Table. 2)

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

Variable	Frequency	Percentage (%)
Beliefs about the best place where	The mouth	11.2
	The armpit (axilla)	49.2

temperature is measured	The rectum (bottom)	3	0.6
	The ear	169	34.5
	I do not know	22	4.5
Beliefs about the normal body temperature	35°C	21	4.3
	35.5°C	14	2.9
	36°C	77	15.7
	36.5°C	100	20.4
	37°C	210	42.9
	37.5°C	57	11.6
	38°C	6	1.3
	38.5	1	0.2
	39°C	0	0
	39.5°C	1	0.2
	≥40°C	0	0
	I don't know	1	0.2
Beliefs about the fever temperature	36°C	19	3.9
	37°C	186	38
	38°C	222	45.3
	39°C	39	8.0
	40°C	21	4.3
	41°C	3	0.6
Beliefs about the complications of fever	Seizure	348	71
	Brain damage	50	10.2
	Death	8	1.6
	Dehydration	24	4.9
	Coma	22	4.5
	Nothing will happen	10	2
	I don't know	28	5.7

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106 **Parents' practices in managing Fever:**

107 In this study, approximately a third of parents (31.8%) used to use their hands in assessing their
108 children's temperature while, 28.6% of them used electronic thermometer and 26.5 % used a tympanic
109 thermometer. 38.4% of the parents check the temperature each 15 to 30 minutes. Approximately half of
110 parents (47.3%) considered the age of the child when giving fever lowering drugs then followed by the
111 severity of fever (29.4%) and only a 19% had considered the dosing of antipyretic based on the weight.
112 Two thirds of parents followed the previous advice from the pediatrician in selecting the right fever
113 lowering drug while, 15.7% of parents did that based on the information gathered from the media. The
114 most commonly used drug was acetaminophen in 96.9% and about 14.7% of the parents, they used
115 antibiotics in addition to acetaminophen (with/without medical advice). In calculating the dose of the
116 drug nearly half of patients (46%) followed the previous advice from the pediatrician while, 28% read

117 the package leaflet and only 13% used to consult the pharmacists. Concerning the route of medication
 118 administration, in 62.4% of the parents the medications were given orally, whereas in 36.9% they were
 119 given by rectal route. In addition, 78.4% of the participants used a specific measuring spoon or syringe
 120 of the drug for giving the medication. Regarding to the non-pharmacological therapy, the ice pack was
 121 the most commonly used by parents (62.7%) followed by tepid sponging in 23.3%. (Table 3) This study
 122 also revealed that most of the parents gave their children treatment for fever when the temperature was
 123 more than 38°C and 38.6% of them would call the doctors when child fever reached 39°C followed by
 124 31.4% at 38°C. In addition, the results of the bivariate analysis of giving a medication showed
 125 statistically significant difference that more parents who have < 6 children had reported giving
 126 medication when a temperature read $\leq 37^\circ\text{C}$ than $\geq 38^\circ\text{C}$ ($P = 0.011$).

127 **Table (3) Parent's practices in managing childhood fever (n = 490)**

Variables		f	%
Methods to measure the temperature	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
	I do not know	1	0.2
Frequency of measuring the temperature, every:	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
To give a fever lowering drug, you Consider	Age	232	47.3
	Sex	2	0.4
	Weight	93	19
	Height	2	0.4
	Severity of fever	144	29.4
	Severity of illness	17	3.5
The right fever lowering drug would be decided by	Previous advice from the pediatrician	328	66.9
	Consulting the pharmacist	12	2.4
	Consulting other persons	5	1
	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
Drug	Acetaminophen	475	96.9
	Ibuprofen	48	9.8

administered for fever	Aspirin	0	0
	Antibiotics	72	14.7
The right dose of fever-lowering drug would be decided by	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
Route of medication administration	Orally	306	62.4
	Rectally	181	36.9
	Injection	3	0.6
Instrument used to administer the Medication	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
Remedies used in addition to drugs	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

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

130 In illustrating the reasons of giving antibiotics to febrile child, 62% of parents depend on
 131 physicians or a medical prescription, while, 28% reported that they used it whenever they suspected
 132 infection. Only 9.6% of the parents insisted on prescribing antibiotics to their children, even if it was not
 133 considered necessary by the doctor. Only 10% believed that antibiotic should be prescribed to all
 134 children who developed fever. (Table 4)

135 **Table (4) The parents' practice in obtaining and using antibiotics.(n = 490)**

Variables		Frequency	%
Reason of giving an antibiotic drug for child	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	0.6
	A relative suggestion	2	0.4
	Found information on the Internet, TV, or papers about its benefits	5	1
	In all the cases above	38	7.8

Insisting in prescribing antibiotics to child even if the doctor didn't consider it necessary	Yes	47	9.636
	No	443	90.364
All children who develop fever the antibiotics should be prescribed to them	Yes	49	10.40
	No	441	90.40

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145 Discussion

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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.

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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.

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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

171 parents who have ≥ 6 children used to give their child medication when the temperature is $\geq 38^{\circ}\text{C}$, this
172 may be explained by more experience for determining the fever temperature from previous incidences
173 and less concern regarding complication. A previous study reported that when a child grow up parents
174 would have experience with resultant less fever concern [17].

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

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

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

197 Large percentages of parents decide the right drug (66.9%) and calculate the dose (46%) based
198 on previous advice from a pediatrician. Approximately half of parents (47.3%) consider the age of the
199 child when giving antipyretic drugs then followed by the severity of fever (29.4%) and only a 19%
200 considering the weight, which indicated a lack of awareness regarding the importance of considering the
201 weight when giving fever lower drugs. The interesting finding is that parents have a good awareness

202 about using antibiotics. Among 14.7% of antibiotics used 62.0% of parents used them based on physician
203 prescription.

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205 **Limitation:**

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

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214 **Conclusion:**

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

220 **Ethical Disclaimer:**

221 The study followed the regulations of the national Ethical committee and it was approved by Qassim
222 University ethical committee.

223 **Consent :**

224 As per international standard, parents of the children's informed written consent has been collected and
225 preserved by the author(s).

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