

## Evaluation of Parent's Knowledge About Fever

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Authors NEH, NM, BSBD and LK contributed to the drafting, literature search, proof reading and finalization of the write up of this case report. All the authors have read and agreed to the final manuscript.*

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## ABSTRACT

**Introduction:** Fever in children is the most frequent reason for pediatric consultation. **Aims of the Study:** To assess parent's knowledge and behavior regarding fever in children before the consultation. **Methodology:** This survey was carried out among 614 who agreed to answer a pre-established questionnaire, having consulted in the pediatric medical emergency department of the children's hospital in rabat. **Results:** Fever was defined in 64.2% of parents as a temperature above the threshold of 38 ° C. It was measured in 37.9% of cases by the axillary method, the drugs most used were paracetamol and ibuprofen, with the use of paracetamol first in 73.9%, the administration of the drug was based of the weight in 58.7%. Angina was considered the most likely cause of fever (72.7% of cases). **Conclusion:** The results of our survey show the need to improve parent's knowledge of fever as well as its management at home.

*Keywords: Fever; knowledge; parents.*

## 1. INTRODUCTION

Fever is a common symptom in children. It can be indicative of a serious illness but its origin is most often benign [1], the initial management of which is the responsibility of the parents. The interest is to bring the parents to a level of knowledge allowing them to manage the fever of their children, and to know the appropriate moment to consult the doctor. The other benefit is to reduce parental anxiety [2-3], considered as an important determining factor in their action. The main objective of this study is to evaluate the level of knowledge of parents concerning acute fever in children and infants.

## 2. MATERIALS AND METHODS

This is a descriptive prospective study conducted in pediatric medical emergencies from 15 March 2019 to 15 March 2020.

**\*Selection and inclusion criteria:** Data collection were included parents who agreed to answer a pre-established questionnaire in the pediatric medical emergency department of the children's hospital in Rabat, over a period of one year.

Sociodemographic and epidemiological informations (age, profession and socioeconomic level of the parents), informations concerning the fever and its management (the fever threshold, the temperature measurement methods, the physical measurements undertaken by the parents and drug treatments used), knowledge of the causes and severity of fever, and the main sources of information about fever.

Data were collected on Excel software and statistics by Spss version 12 software. The quantitative variables were expressed as means and standard deviations in the case of a Gaussian distribution and in median and quartiles in the case of a non-Gaussian distribution. The qualitative variables were expressed in effectives and percentages.

## 3. RESULTS

614 parents accepted to answer the pre-established questionnaire

**1-Epidemiological characteristics of the children and parents interviewed:** The average age of the children in our study was 3 years old, with a

predominance of male (53.4%). The socioeconomic level was low in 72.8% of the parents questioned.

The analysis of educational level showed that 16.9% of fathers were illiterate against 30.9% who had primary education and 43.8% with secondary level, 8.4% with university level.

Regarding the educational level of mothers, 25.7% were illiterate, Against 29.8% who had a primary education level and 43.6% with a secondary level, 8% with a university level. (Table 1).

**2- Knowledge of fever threshold and methods of measuring body temperature:** The fever was considered in 44.5% of parents to be a temperature of 38°, while 24.9% gave figures below 38 °C. A category of 10.9% does not know a precise threshold to define fever .

The most widely used method for measuring temperature in children was the axillary one (37.9%), followed by the rectal way (30.3%).

The electronic thermometer has been used from 66% of parents , 31.4% used the manual method by touching the forehead.

The most percentage of parents (79.4%) have used one drug to treat fever, paracetamol was the most used in 73.9%.

A percentage of 58.7% of parents gave the antipyretic treatment according to weight, and 15.3% according to age. (Table 2).

**3- Physical antipyretics and Traditional pharmacopoeia:** Physical methods are used by 83.6% of parents, Undressing the child (61%), abundant drinks (56.7%) with a lukewarm bath (43.3%) and moistened compresses on the large vascular axes (46.9%) are widely used to lower the temperature feverish children.

Traditional pharmacopoeia was used from 73.3%, mainly vinegar in 71.7% then rose water in 54% and anserine in 34.4%, lemon in 33.3% (Table 3).

**4- Causes, signs of severity and sources of information about fever:** The causes of fever according to parents are represented by angina (72.7%) otitis (50.6%), gastroenteritis (39.1%), pneumopathy (32.9%), nasopharyngitis (16.5%), meningitis (13.1%), and teething (3.5%).

**Table 1. Descriptive table of the epidemiological characteristics of children and their parents**

<b>Variables</b>	<b>Results</b>
Average age (years)*	-3 [1,1 ;6 ]
Sex**	
- Male	- 328 (53,4)
- Female	- 286 (46,6)
Socioeconomic Level**	
- Low	- 447 (72,8)
- Medium	- 165 (26,9)
- High	- 2 (0,3)
Father's profession**	
- Official function	- 97 (15,8)
- Liberal function	- 517 (84,2)
Father's age ***	- 40 [ 7,5 ]
Mother's profession**	
- Howsewife	- 557 (90,7)
- Official function	- 25 (4,1)
- Liberal function	- 32 (5,2)
Mother's age***	- 32 [7]
Origin**	
- Rural environment	- 180 (29,4)
- Urban environment	- 432 (70,5)
City**	
- Rabat	-139 (22,6)
- Salé	-228 (37,1)
- Témara	-88 (14,3)
- Other	-159 (25,9)
Parents marital status**	
- Married	- 592 (96,4)
- Divorced	- 19 (3,1)
- Single	- 3 (0,5)
Father's education level **	
- Illiterate	-103 (16,9)
- Primary	-188 (30,9)
- Secondary	-266 (43,8)
- University	-51 (8,4)
Mother's education level **	
- Illiterate	-158 [25,7]
- Primary	-183 [29,8]
- Secondary	-236 [38,4]
- University	-37 [6]

\*: Median (quartiles)

\*\*: Effectif (percentage)

\*\*\*: Average (standard deviation)

**Table 2. Descriptive table of parameters of parents' knowledge about fever**

<b>Variables</b>	<b>Results</b>
Temperature value (degree Celsius): *	
- 37° :	- 92 (15)
-37,5° :	- 61 (9,9)
-38° :	- 273 (44,5)
-38,5° :	- 29 (4,7)
-39° :	- 68 (11,1)
-39,5° :	- 4 (0,7)
->40 :	- 20 (3,2)
-Do not know :	- 67 (10,9)
Temperature measurement method: *	
- Electronic thermometer:	- 405 (66)
- Mercury thermometer:	- 16 (2,6)
- By placing the hand on the forehead:	- 193 (31,4)
Temperature evaluation method: *	
- Rectal	- 186 (30,3)
- Axillary	- 233 (37,9)
- Buccal	- 1 (0,2)
- ear	- 0 (0)
- Rectal and axillary approach	- 5 (0,8)
- Evaluation with touch	- 189 (30,8)
Medical treatment :*	
-Paracetamol	- 453 (73,9)
-Ibuprofen	- 35 (5,7)
- Aspirin	- 6 (1)
- Antibiotic	- 0 (0)
- Others	- 0 (0)
- Paracetamol + Ibuprofen	- 114 (18,6)
- Paracetamol + Antibiotic	- 2 (0,3)
- Ibuprofen + Antibiotic	- 1 (0,2)
- Paracetamol + Aspirin	- 1 (0,2)
- Ibuprofen + Aspirin	- 1 (0,2)
If very high fever: * Antipyretic:	
-Monotherapy	- 487 (79,4)
-Dual therapy	- 21 (3,4)
- 2 drugs alternately	- 105 (17,1)
Number of total doses of drugs per 24 hours: *	
- Less than 3 doses	- 57 (9,3)
- Between 3 and 4 doses	- 437 (71,4)
- more than 4 doses	- 118 (19,3)
Treatment administration according to: *	
- Age	- 94 (15,3)
- Weight	- 360 (58,7)
- Age + Weight	- 131 (21,4)
- Any method	- 28 (4,6)

\*: Effectif (percentage)

**Table 3. Descriptive table of the main physical and Traditional pharmacopoeia used in fever of children**

Variables	Results
Physical methods :*	
- Yes:	- 513 (83,6)
- No :	- 101 (16,4)
- Lukewarm bath:	- 221 (43,3)
- Abundant drinks:	- 289 (56,7)
- Ventilate the room:	- 63 (12,4)
- Undress the child:	- 311 (61)
- Compresses moistened on large axes:	- 239 (46,9)
- Valium:	- 6 (1,2)
- Others	- 0 (0)
Traditional pharmacopoeia:*	
- Yes :	- 450 (73,3)
- No :	- 164 (26,7)
- Anserine	- 154 (34,4)
- Oil of cade	- 23 (5,1)
- Vinegare	- 321 (71,7)
- Rose water	- 242 ( 54 )
- Lemon	- 149 ( 33,3 )
- Olive Oil	- 31 ( 6,9 )
- Onion	- 48 ( 10,7 )
- Mint	- 12 ( 2,7 )
- Others	- 0 ( 0 )
Time between fever and consultation: *	
Median time after onset of fever: 24 hours	
- Before 24h:	- 330 (54,1)
- After 24 hours	- 282 (46)
Parent's attitude : *	
- Spontaneous treatment	- 459 (74,8)
- Use of the pharmacist	- 68 (11,1)
- Referral to the doctor	- 87 (14,2)

\*: Median (quartiles)

The signs of severity associated with fever recognized by parents are convulsions (64.7%), persistent fever for several days (62.5%), breathing difficulties (55.7%), headaches associated with vomiting (49.8%), constant diarrhea and vomiting (46.3%), rash (37.5%), acute dehydration (27.9%), drowsiness (26.9%), unusual pallor (26, 7%), anorexia (24.8%), high fever in infants less than 3 months (24.1%), excessive sweating (17.8%), difficulty falling asleep (17.8%), unusual excitement (7,2%)

Parents report having been informed about fever by family and friends in 58.5% , the pharmacist (44.1%), the general practitioner (41.9%), pediatrician (39.2%), the Internet (9.5%), television (2%), school and teachers (1%), magazines (0.3%), and no source of information at (1.3%). (Table 4).

#### 4. DISCUSSION

Physiologically, fever is considered a natural and beneficial response of the body to fight infection [4]

Our study showed that 44.1% of the parents questioned considered the fever to be a temperature greater than or equal to 38 °C and 24.9% of the parents gave a value lower than 38 °C, compared to the study by Stagnara [5] which showed that 59% of 202 parents surveyed defined fever as a temperature of 38 °C or above.

In the study by Bong et al., Only 39.5% and 51% of participants knew the correct temperature to define fever and high fever respectively [6]

Poor understanding of fever would subsequently lead to more frequent use of antipyretics [7] [8]. The poor knowledge of what temperature is considered fever may be a worldwide phenomenon.

However, the low threshold for administration of fever-reducing drugs is not unique to parents in Morocco, as other studies in the United States, Israel, Australia and Italy where the proportion of parents giving drugs antipyretics before the temperature reached 38 °C ranged from 2% to more than half [9].

**Table 4. Descriptive table of the main causes, signs of severity and sources of information about fever**

Variables	Results
Causes of fever: *	
- Angina:	- 437 (72,7)
- Otitis:	- 304 (50,6)
- Gastroenteritis:	- 235 (39,1)
- Nasopharyngitis:	- 99 (16,5)
- Meningitis:	- 79 (13,1)
- Pneumopathy:	- 198 (32,9)
- Teething:	- 21 (3,5)
Signs of severity (according to parents): *	
- Convulsions	- 397 (64,7)
- Persistence of fever	- 384 (62,5)
- Headache + vomiting	- 306 (49,8)
- High fever in infants less than 3 months	- 148 (24,1)
- Constant vomiting + diarrhea	- 284 (46,3)
- Breathing difficulties	- 342 (55,7)
- drowsiness	- 165 (26,9)
- Skin rash	- 230 (37,5)
- Unusual pallor	- 164 (26,7)
- Excessive sweating	- 109 (17,8)
- Difficulty falling asleep	- 101 (16,4)
- Unusual excitement	- 44 (7,2)
- Anorexia	- 152 (24,8)
- Acute dehydration	- 171 (27,9)
Information source :*	
- General practitioner	- 257 (41,9)
- Pediatrician	- 210 (34,2)
- Pharmacist	- 271 (44,1)
- School and teachers	- 6 (1)
- Family and friends	- 359 (58,5)
-Internet	- 56 (9,5)
- Television	- 12 (2)
- Magazines	- 2 (0,3)
-Any	- 8 (1,3)

\*: Effectif (percentage)

Parents with less education are more likely to believe that a fever is dangerous [10], in our study 91% of fathers had an educational level below secondary school, and 94% of mothers, 25% of whom were illiterate.

The electronic rectal thermometer remains the reference method to measure temperature [11-12], whereas in our study the axillary method was predominant by 37.9% compared to the rectal one (30.3%).

In Crocetti's study, 76% of parents reported using a thermometer to check their child's temperature, and the preferred method was axillary (68%) [13], compared to 24% of respondents to Schwartz's study et al [14] who reported that 65% of Latino parents rely on touch or visual observation to determine their child's fever, in our study 37.9% of parents used the axillary method and 30.3% used the rectal one.

Paracetamol is now the reference treatment among the antipyretic specialties available [15]. In our study, paracetamol (73.9%) was the most used. In the Bourros survey [16] paracetamol was used in 71.7% of cases, ibuprofen in 2.8% of cases, and acetylsalicylic acid in 25.5% of cases. While paracetamol-based specialties remain dominant, NSAIDs are gradually gaining ground. However, although it has been shown that the onset of action of ibuprofen is slightly less than that of paracetamol, its effectiveness remains equivalent to that of paracetamol but exposes a risk of much more frequent side effects [12, 17-25].

J. Stagnara's investigation [5] also provides some answers on the behavior of parents before calling on a medical resource. Most parents cool the child by bathing (63% Lyon vs. 75% Toulouse) while undressing and hydration are less systematic, compared with our study where 61% of parents undress their children and 56,7% rehydrate them.

Most parents (94%) use the drugs more than once before calling a doctor.

In Crocetti's study, parents said changes in weather and cold air (17%), pain (3%), teething (3%), illness (2%), immunization (1%) can cause fever. (11%) of parents said they did not know the probable cause of fever in their children [13], however in our study parents considered angina (72,7%) otitis (50,6%) and pneumopathy (32,9%) the main causes of fever. Fever phobia

causes both health care providers and parents to overtreat fevers. This places children at risk of medication toxicity, needless repeat temperature readings, and parental panic. [26]

Efforts to improve health education about fever should be considered for the general public, as the ability to correctly identify fever would prevent appropriate management. [6]

Teaching parents what to do when their child had a fever can help improve parental knowledge and satisfaction and reduce inappropriate care visits [27]

Important educational points should include the definition of fever, the role of fever in childhood illnesses, what to assess during febrile episodes and when a medical visit is needed [26] [28].

## 5. CONCLUSION

Our study reports the results of the responses of 614 parents questioned on the knowledge and management of acute fever in children. Numerous shortcomings in the management of fever in children by parents were found.

It is important to inform parents by emphasizing three fundamental ideas that fever is a natural and beneficial defense mechanism, to give preference to paracetamol as monotherapy in 4 doses per day and adapting the dose to the weight, and to know the signs associated with fever which may lead to a medical consultation should be better understood by parents.

## DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

## CONSENT

Informed verbal consent was taken from the parents of all children.

## ETHICAL APPROVAL

The Ethics Committee has been informed that the study is about the evaluation of parent's knowledge about fever.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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