

# Knowledge and management of fever among Moroccan parents

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## المعارف وتدابير الحمى لدى الآباء في المغرب

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الخلاصة: كثيراً ما يكون لدى الآباء أفكار خاطئة عن الحمى التي تصيب الأطفال، كما أن المعلومات المتاحة عن التدبير العلاجي المنزلي للطفل المصاب بالحمى قليلة في المغرب. وقد استهدفت هذه الدراسة معرفة مُدركات ومعارف وممارسات الأسر حول الحمى التي تصيب الأطفال، فأجرى الباحثون مقابلات مع 264 من آباء الأطفال الذين أصيبوا بالحمى في أعمار تراوحت بين 0-16 عاماً، وذلك في قسم طوارئ الأطفال في الرباط في عام 2011. واتضح للباحثين أن 3.5٪ فقط من الآباء يعرفون التعريف الصحيح لدرجة الحرارة أثناء الحمى، وأن 54.4٪ منهم يتعرفون على إصابة الطفل بالحمى باستخدام مقياس الحرارة، وأن الموضع المفضل لقياس درجة الحرارة هو الشرج، وأن معظم الآباء (96.8٪ منهم) يعتبرون الحمى حالة خطيرة قد تقود إلى تأثيرات جانبية مثل تحزب الدماغ (28.9٪)، والاختلاجات (18.8٪)، والشلل (19.5٪)، وضيق النفس (14.8٪)، والسبات (14.8٪). وقد تم استخدام الباراسيتامول في 85.9٪ من الحالات، والمعالجات التقليدية في 45.1٪ من الحالات. وقد ترابطت المعرفة المتعلقة بالتعريف الصحيح للحمى بمقدار يُعتد به إحصائياً مع مهنة الآباء، ومستواهم التعليمي ومع تلقّيهم معلومات مسبقة ومشورات من المهنيين الصحيين.

ABSTRACT Parents often have misperceptions about childhood fever, and little information is available about the home management of feverish children in Morocco. In this study of the perceptions, knowledge and practices of families regarding children's fever, the parents of 264 febrile children aged 0–16 years were interviewed in a paediatric emergency department in Rabat in 2011. Only 3.5% of parents knew the correct temperature definition for fever, 54.4% determined their children's fever using a thermometer, and the preferred site was rectal. Most of them (96.8%) considered that fever was a very serious condition, which could lead to side-effects such as brain damage (28.9%), seizures (18.8%) paralysis (19.5%), dyspnoea (14.8%) and coma (14.8%). Paracetamol was used by 85.9% and traditional treatments by 45.1%. Knowledge about the correct definition of fever, was significantly associated with parents' profession, educational level and receipt of previous information and advice from health professionals.

## Épisode fébrile chez l'enfant : connaissances des parents marocains et prise en charge par ces derniers

RÉSUMÉ Les parents ont souvent des perceptions erronées concernant la fièvre chez l'enfant, et les informations sur la prise en charge des enfants fébriles à domicile sont rares au Maroc. Dans la présente étude sur les perceptions, les connaissances et les pratiques des familles au sujet de la fièvre chez l'enfant, les parents de 264 enfants fébriles âgés de 0 à 16 ans ont été interrogés au sein d'un service d'urgence pédiatrique de la ville de Rabat en 2011. Seuls 3,5 % des parents connaissaient la température exacte définissant un état fébrile et 54,4 % déterminaient la fièvre de leur enfant à l'aide d'un thermomètre, de préférence par voie rectale. La plupart d'entre eux (96,8 %) considéraient que la fièvre était une affection très grave qui pouvait conduire à des effets secondaires tels que des lésions cérébrales (28,9 %), des convulsions (18,8 %), une paralysie (19,5 %), une dyspnée (14,8 %) et un coma (14,8 %). Le paracétamol a été utilisé par 85,9 % des parents et les traitements traditionnels par 45,1 %. La connaissance de la définition exacte de la fièvre était significativement associée à la profession des parents, à leur niveau d'études et à la prise de conseils et d'informations préalable auprès des professionnels de santé.

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## Introduction

Fever is one of the most common presenting complaints in paediatrics and general practice and is the cause of nearly 70% of all paediatric visits (1). A number of studies have investigated parents' knowledge, perceptions, theories and practices of childhood fever (2–5). Parents frequently perceive fever as a disease rather than as a symptom or sign of illness (2), as defined by Schmitt in 1980 who introduced the term "fever phobia" to describe parents' fearful view of fever (3). Insufficient knowledge of parents concerning the cause of fever, and misconceptions about its effects on their children's health frequently lead to excessive fear and anxiety (4). A frequent finding is that parents are not correctly informed about temperature, defining fever as a medical term (6–8).

Impicciatore et al. studying mothers' perceptions and attitudes towards fever and its treatment found that most mothers did not know how to manage fever (9). Two studies in Greece reached to the same conclusions; Anagnostakis et al. found that parents had incorrect perceptions about fever and worried about temperatures that were considered normal (10), while Mathioudakis et al. found that only 1.4% of parents correctly evaluated and treated fever and 64.6% used the wrong dosages of antipyretics (11). Studies further show that educational level, socioeconomic status and cultural background are the main determinants of knowledge and judgement of childhood fever (12,13). A higher socioeconomic status and educational level contributed to a more scientifically oriented knowledge of fever.

Little information is available about the home management of feverish children in Morocco; in particular, no studies have been published on parents' knowledge, perceptions and attitudes regarding fever in their children. The aim of our study was to reveal the

perceptions, knowledge and practices of families regarding childhood fever and to discuss the differences between our population and other populations.

## Methods

### Study sample

This study participants were a convenience sample of parents of children aged 0–16 years attending the paediatric emergency department during 4 months from July to October 2011. Only the parents were asked to participate in the study. All of the parents who we approached agreed to be in the study and none were excluded.

### Data collection

On arrival at the department, the parents of the child were asked to answer to a questionnaire while waiting for examination of the child. The parents were informed about the study, reassured about the confidentiality of data and their right to refuse participation without any consequences for the treatment of their children and requested to verbally consent to participation.

The parents were interviewed using face-to-face interviews in Moroccan Arabic. The interviews, which were conducted in a separate room of the department in order to guarantee privacy, lasted approximately 20 minutes. One physician read questions to the participant from a questionnaire and the parents were given no assistance with answering the questions. The participants were asked open-ended yes/no and multiple-choice questions about sociodemographic data and their knowledge (4 items), beliefs (4 items) and practices (11 items) concerning fever. Parents were also asked if they had received advice or general information in the past from physicians, pharmacists, nurses or parents regarding the management of fever. A temperature of 38 °C or above was considered to indicate fever (14).

### Data analysis

Statistical analyses were performed using SPSS, version 13.0. Data were presented as percentages and means and standard deviation (SD). Statistical significance was determined by the Pearson test. A value of  $P < 0.05$  was considered significant. All variables were coded as dummy variables. In univariate analysis, a logistic regression model was used to search for factors that influenced parents' knowledge about the definition of fever temperature and their practices regarding fever and to calculate their odds ratios (OR) and 95% confidence intervals (CI). Variables with  $P < 0.25$  were entered into the multivariate analysis

## Results

The total number of parents interviewed was 264. The mean age of parents was 31.6 (SD 8.5) years and most of them (81.0%) were mothers. The sociodemographic characteristics of parents are summarized in Table 1. A majority resided in urban areas (88.6%).

Only 3.5% of the parents knew the correct temperature definition for fever. Just over half the parents (54.4%) determined their children's fever using a thermometer, while 44.4% stated that fever could be determined by touching the child's forehead. Of the parents, 58.9% could read the thermometer. The preferred route of measuring temperature was rectal (Table 2). In our study, 96.8% of parents considered that fever was a very serious condition, which could lead to side-effects such as brain damage (28.9%), seizures (18.8%), paralysis (19.5%), breathing difficulty (14.8%) and coma (14.8%) (Table 2).

When fever persisted, 85.7% of parents consulted the general practitioner (39.9%) or paediatrician (45.8%). Of all the parents, 72.0% had received no information about fever and 47.3%

**Table 1** Parents' demographic characteristics and receipt of information/advice about childhood fever in relation to correct knowledge about the definition of fever temperature

Variable	Total (n = 264)		Correct knowledge about definition of fever (n = 58)	
	No.	%	No.	%
<i>Mean (SD) age (years)</i>	31.6 (8.5)		33.6 (8.1)	
<i>Mean (SD) no. of children</i>	2.1 (1.4)		1.9 (1.2)	
<b>Socioeconomic level</b>				
Low	57	21.6	4	6.9
Middle	192	72.7	44	75.9
High	15	5.7	10	17.2
<b>Educational level</b>				
Illiterate	92	35.0	9	15.8
Primary school	58	22.1	6	10.5
High school	59	22.4	17	29.8
University	54	20.5	25	43.9
<b>Profession</b>				
Not working	159	60.9	28	50.0
Retired	1	0.4	0	0.0
Private sector	54	20.7	8	14.3
Public sector	47	18.0	20	35.7
<b>Place of residence</b>				
Urban	234	88.6	58	100.0
Rural	30	11.4	0	0.0
<b>Received general information about fever</b>				
Yes	191	72.6	22	38.6
No	72	27.4	35	61.4
<b>Received advice about fever</b>				
Yes	139	52.7	13	22.4
No	125	47.3	45	77.6

SD = standard deviation.

had received advice on management of a feverish state for their children. The source of information was mainly from a paediatrician (23.5%), general practitioner (21.2%) or the experience of grandparents (16.3%). The parents' interventions for their children's fever are shown in Table 3. Paracetamol was used by 85.9% of parents and traditional treatments by 45.1%.

Table 1 shows the demographic characteristics and receipt of information/advice of those with correct knowledge about the definition of fever temperature, while Table 4 shows the univariate and multivariate analysis of the data. Variables which did not

significantly affect knowledge about their definition of fever were age ( $P = 0.059$ ), sex ( $P = 0.241$ ), place of residence (urban/rural) ( $P = 0.998$ ) and number of children in the family ( $P = 0.415$ ). Higher socioeconomic level was associated with better knowledge about the definition of fever in the univariate ( $P < 0.001$ ) but not in the multivariate analysis ( $P = 0.453$ ). In multivariate analysis, parents' educational level ( $P < 0.001$ ), profession ( $P = 0.016$ ), and previous information ( $P = 0.007$ ) and advice about fever ( $P = 0.007$ ) were significantly associated with knowledge regarding the definition of fever (Table 4).

## Discussion

The present study is an analysis of Moroccan parents' perceptions, knowledge and interventions about fever. Half of the parents in this study were high-school graduates. Most of the parents were assumed to be socioeconomically relatively advantaged because our emergency department is located in the capital city.

The use of a thermometer is the only way to determine whether a child is febrile. All other methods including tactile and visual assessment are inaccurate (6); for example, it has been shown that touching the forehead detected only

**Table 2 Parents' knowledge, practices and beliefs about childhood fever**

Characteristic	No.	% (n = 264)
<b>Definition of fever temperature (°C)</b>		
38-< 38.5	9	3.5
< 38 or > 38.5	162	61.3
Don't know	93	35.2
<b>Way of measuring child's temperature</b>		
Thermometer	143	54.4
Touching the forehead	117	44.5
Chills	5	0.8
If the child drinks a lot	1	0.4
<b>Has a thermometer at home</b>		
Yes	161	61.2
No	102	38.8
<b>Type of thermometer used to take child's temperature</b>		
Rectum	126	73.7
Armpit	43	25.1
Ear	2	1.2
<b>Can read the thermometer</b>		
Yes	142	58.9
No	99	41.1
<b>Believe fever has a purpose</b>		
Yes	8	3.1
No	246	96.9
<b>Believe fever is dangerous</b>		
Yes	153	59.5
No	104	40.5
<b>Dangers specified</b>		
Neurological	43	28.9
Seizures	28	18.8
Paralysis	29	19.5
Breathing difficulty	22	14.8
Coma	22	14.8
Death	4	2.7
Blindness	1	0.7

74% of all febrile children (15). In the our study, 54.4% of the parents used a thermometer to detect their children's fever, but nearly half of them detected fever by touching the children's forehead, which is frequently considered by parents to be the most accurate way of measuring an infant's temperature (16).

Axillary temperatures are adequate for clinical screening or fever (15). In our study, three-quarters of parents preferred the rectal route for temperature

measurement and only one-quarter preferred to take axillary temperature. This was different to the findings of other studies in the literature (17, 18). In our hospital, we do not have strict policies on paediatric temperature measurement. Rectal or axillary measurement is the preferred route in children younger than 5 years old. Parents may think that measuring the rectal temperature is more appropriate for fever.

In the present study, 96.5% of the parents stated the incorrect temperature or did not know the correct temperature for fever. This was similar to the findings of previous reports in culturally diverse populations in different countries (6, 7, 17, 19). The parents with higher educational level demonstrated a significantly higher rate of accuracy in their knowledge of fever definition in our study ( $P = 0.001$ ), in accordance with the findings of previous studies conducted among different populations (20–22).

In our study the majority of parents used paracetamol as an antipyretic in treating children's fever, corroborating the findings of studies in other populations (6, 7, 17). Aspirin and ibuprofen were not preferred in our study sample. In our hospital, we frequently inform parents about the risks of aspirin use in febrile children (such as Reye syndrome and gastrointestinal bleeding). These could be the reasons why the parents in the present study preferred paracetamol as an antipyretic. In our Moroccan traditions, iced water is not used as a method of lowering the temperature, while other methods are practised such as towels soaked in cold water.

Nearly 60% of the parents in our study believed that fever could have dangerous effects on children, even death. Of all the parents, 28.9% listed brain damage as the most common harmful effect of fever, 18.8% seizures, 19.5% paralysis and 14.8% coma. In the literature, it was reported that many of these beliefs are also shared by paediatric health care providers (12) and fever phobia was the message that they conveyed to parents (21).

Parental educational status showed a significant effect on the parents' interventions and knowledge about fever, a finding which corroborates other studies from different populations (6, 17, 20, 23, 24). In our study, parents who had received advice from their doctor and therefore had more information than those who had not had advice, knew better how to manage their febrile children.

**Table 3 Therapeutic interventions used by parents to treat childhood fever**

Variable	No.	% (n = 264)
<b>Physical measures</b>		
Bath	80	46.8
Undressing	36	21.1
Drinks	27	15.8
Wet towels	28	16.4
<b>Antipyretics</b>		
Paracetamol	213	85.9
Aspirin	22	8.9
Ibuprofen	13	5.2
<b>Route of administration of antipyretics</b>		
Rectal	154	64.2
Oral	86	35.8
<b>Traditional treatments</b>		
Rosewater	65	45.1
Vinegar	23	16.0
Lemon	11	7.6
Anserine <sup>a</sup>	45	31.3

<sup>a</sup>*Chenopodium ambrosioides (wormseed).*

**Table 4 Regression analysis of factors influencing parents' correct knowledge about the definition of fever temperature**

Variable	Univariate analysis			Multivariate analysis		
	OR	(95% CI)	P-value	OR	(95% CI)	P-value
Age	1.03	(1.00-1.07)	0.059	n/a	-	-
Sex	0.67	(0.34-1.32)	0.241	1.01	(0.96-1.06)	0.803
Educational level	2.19	(1.60-2.84)	< 0.001	2.36	(1.45-3.85)	0.001
Profession	1.37	(1.09-1.73)	0.007	0.60	(0.40-0.91)	0.016
Socioeconomic level	5.16	(2.41-11.1)	< 0.001	1.47	(0.54-4.02)	0.453
Place of residence	0.00	0.00	0.998	n/a	-	-
Received general information	7.27	(3.83-13.8)	< 0.001	3.23	(1.39-7.55)	0.007
Received advice	5.45	(2.77-10.7)	< 0.001	3.24	(1.38-7.60)	0.007
No. of children	0.90	(0.73-1.14)	0.415	n/a	-	-

OR = odds ratio; CI = confidence interval; n/a = not applicable.

One limitation of the present study was that data were collected from parents presenting to one emergency

department. Therefore the findings might not be generalizable to the Moroccan population. Multi-centre trials

may show differences in trends and provide useful comparisons.

**Competing interests:** None declared.

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