



# Knowledge, Attitudes and Practices of Mothers Concerning Fever among Children under Five Years of Age in the Mabulu 2 Quarter in Kinshasa

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## Abstract

**Purpose:** This exploratory study aims to improve the knowledge, attitudes and practices of mothers in the face of fever in children under five years old. **Material and Methods:** A cross-sectional study carried out from 1 to 30 November 2022 among 36 mothers with children under five years old in the Mabulu 2 quarter, using a questionnaire is analyzed using the jamovi 2.3.28 software. Descriptive analyses, Fisher's exact test and Spearman's correlation ( $\alpha = 0.05$ ) were used. **Results:** Knowledge: 94.4% of mothers consider fever to be an illness. 66.7% believe that the best temperature sampling site is the armpit, which the first step to take is to administer medication and know that we can use a wet wrap and paracetamol. Attitudes: 55.6% go to the pharmacy; 69.4% prefer to combine the antipyretic and the antibiotic; 75% maintain that an overdose makes it possible to obtain a rapid drug effect and 97.2% are for a dose adapted to the child's weight. Practices: 69.4% of mothers evaluate the fever by touch; 52.8% evaluate the effects of the intervention at more than 2 hours; 80.6% use the teaspoon for the dose and 66.7% use antibiotics without a doctor's prescription. Attitudes were associated with level of education ( $p = 0.003$ ) and compliance with the vaccination schedule ( $p = 0.035$ ). The practices depended on the age of the mothers ( $p = 0.014$ ). A positive correlation was found between knowledge, attitudes and practices ( $p < 0.01$ ). **Conclusion:** It is useful to educate mothers in the Mabulu 2 neighborhood on fever in order to improve their knowledge, attitudes and practices when it occurs in toddlers.

## Subject Areas

Public Health

## Keywords

Knowledge, Attitude, Practice, Fever, Mothers, Children under Five

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### 1. Introduction

Fever is a major public health problem in the field of pediatrics. It is considered a frequent symptom in children and is the cause of nearly 65% to 70% of pediatric consultations. On its own, it can cause rare serious complications in children, such as febrile seizures. Its appearance in children under the age of five causes discomfort in parents and is the cause of their distress and anxiety. These combined aspects lead to parental concerns [1].

Fever phobia among parents, among others, has been documented in several studies, including in Canada, Italy, France, Ireland, Jordan, Nigeria, and Morocco [2].

The reported results of these studies revealed several aspects including insufficient parental knowledge of fever, leading to wrong approach to fever, such as inappropriate use of antipyretic drugs and antibiotics, inappropriate use of physical methods to lowering and measuring fever, misperception of fever as a disease rather than a symptom or sign of disease, misconceptions about its effects on the health of their children. The variations found among these studies are believed to be due to cultural, economic, geographic, demographic and educational differences in populations among countries. In these situations, parents would benefit from educational programs for appropriate fever management [3].

Fever is an abnormally high body temperature exceeding 38°C. According to WHO (2012), the average prevalence of fever was 34.5% in Africa and close to 40% in the Democratic Republic of Congo.

In Kinshasa, very few studies have been conducted on this topic and made available to the public. Observations are made in various pediatric departments of health facilities in the city. Every week, there are at least 3 cases of consultations after an attempt to take care of fever at home by the mothers of children from zero to five years old.

Touched by this reality, we considered this work on this health problem in order to determine the level of knowledge, and to appreciate the attitudes and practices of these mothers in the face of fever. This is to say that the purpose of this study is to improve the knowledge, attitudes and practices of mothers in the face of fever in children under 5 years of age.

Kroeger's theory was developed in 1983 as a model aiming to encompass all the determinants, close or not, of therapeutic practices. It classifies the determinants into three major categories: individual characteristics, characteristics of the disease and characteristics of the healthcare system. Individual characteristics, acting as predisposing factors, include socio-demographic, economic and socio-psychological factors.

## 2. Material and Method

### 2.1. Population and Sampling

The target population is made up of all mothers with children under the age of five in their households and residing in the Mabulu II quarter in the Commune of Selembao. Thus, we resorted to snowball sampling. This method enabled us to reach 36 mothers who met the following inclusion criteria:

- Being a mother of a child under the age of five;
- Have lived in the Mabulu 2 quarter in the Commune of Selembao for at least two years;
- have a child under five who has had a recent episode of fever;
- Being able to speak French or Lingala;
- Accept freely and in an informed manner to participate in the study.

### 2.2. Method

To collect the data, we chose the prospective survey method. The questionnaire is used in the field as a technique for collecting data from the mothers concerned. This technique allowed us to obtain information faithfully relating to the phenomenon under study. The questionnaire used was designed based on the model used in similar studies mentioned in the introduction. Its reliability and validation were tested with 5 mothers in a neighborhood with the same living conditions as the study environment. This allowed adaptation by considering the difficulties encountered during the trial period.

### 2.3. Study Variables

The dependent variable measured in this study is the “management of fever by mothers with children under five”. The independent variables are made up, in addition to the profile of the mothers (age, level of education, access to the media, number of children, profession, monthly income, compliance with the vaccination schedule, etc.), various factors related to the care fever: Knowledge: temperature in case of fever, best temperature sampling site, treatment of fever and others. Attitudes: preferred treatment, dose calculation, route of administration, harmful effects of fever and other measures. Beliefs: mixture of treatments, and other means (prayer, ritual, etc.). For knowledge, attitudes and practices (care), scores were calculated from the various indicators and these scores were divided into sufficient knowledge, good attitudes and good practices for a score of 75% or more and the opposite modalities for a score lower than this value.

Formation of the indicator system took into account a certain number of elements which are the definition of fever, the best site for taking the temperature, knowledge of what to do in the first place in case of fever, the known antipyretics, the physical means to be used then the complications of fever (for knowledge). Related to the attitudes, we have the posture adopted, the preference of treatment, increase in the dose to increase the effects of medicine, use of antibiotics against fever and adaptation of the dose to the weight of the child, concern-

ing the practice, the temperature measuring instrument, the treatment evaluation timing, the dosing instrument, the route of administration and then the use of prescription products.

#### **2.4. Course of the Study**

After the usual formalities, the survey is conducted as follows: We first identified a mother with a child under five who presented with a fever the week of the survey. From her, we entered into contact with the other mothers through her (snowball sampling) and we used the pre-established and pre-tested survey questionnaire.

#### **2.5. Data Processing**

The data collected at the end of this survey are essentially analyzed using statistical tools. These data are checked, codified and entered using the Jamovi version 2.3.21 software. The descriptive analysis made it possible to describe and summarize the characteristics in a few numbers (frequencies, averages and percentages). Statistical inference made it possible to deduce the characteristics of the population from the sample, as well as to highlight the type of relationship existing between the dependent variable and the independent variables. This relationship is verified by Fisher's exact test at the 95% confidence level.

#### **2.6. Ethical Considerations**

In order to properly achieve the objective pursued, the first thing was to seek free and informed consent from the respondents and second to explain to them the importance and/or the merits of the research carried out. Anonymity and confidentiality were strictly observed.

### **3. Results**

#### **3.1. Sociodemographic Data**

It emerges from **Table 1** that the average age of the mothers is  $28.4 \pm 5.4$  years with a majority in the 25- to 29-year bracket (55.56%); 47.2% of mothers have secondary education; 52.8% have access to the media every day; 91.7% have less than three children; 41.7% are women engaged in small informal trade; 80.6% declare having a monthly income of less than 10,000 CFD; 50.0% use mosquito net; 55.6% claim to have respected the schedule the vaccination schedule.

#### **3.2. Knowledge, Attitudes and Practices**

From their knowledge of fever, the majority of mothers consider fever as an illness (94.4) which starts from  $37.6^{\circ}$  (58.3%). They believe that the best temperature sampling site is in the armpits (61.1%) and that the first action to take is the administration of medication (66.7%). The mothers know that we can use a wet wrap (66.7%), paracetamol as an antipyretic (63.9%) and 33.3% know that fever can lead to delirium (**Table 2(a)**).

**Table 1.** Socio-demographic characteristics of participants.

Sociodemographic characteristics	Number (n = 36)	%	Mean ± SD
Mother's age	20 - 24	6	16.7
	25 - 29	20	55.6
	30 - 34	5	13.9
	35 and over	5	13.9
Study level	Without level	10	27.8
	Primary	9	25.0
	Secondary	17	47.2
Access to media	Never	5	13.9
	Sometimes	12	33.3
	Every day	19	52.8
Number of children	<3	33	91.7
	3 and more	3	8.3
Occupation	Vegetable grower	3	8.3
	Small informal trade	15	41.7
	Household	2	5.6
	Employee	11	30.6
	Other	5	13.9
Monthly income	≥10,000 CFD	7	19.4
	<10,000 CFD	29	80.6
Mosquito net use	No	18	50.0
	Yes	18	50.0
Compliance with the vaccination schedule	No	16	44.4
	Yes	20	55.6

**Table 2.** Knowledge, attitude and practice of mothers about fever in children under five.

(a) Knowledge of mothers about fever	Frequency (n = 36)	%	
Fever = sickness	No	2	5.6
	Yes	34	94.4
Definition of fever	37.6°C - 78°C	21	58.3
	38°C and above	5	13.9
	Do not know	10	27.8
Best pick up site	Armpit	22	61.1
	Blocked	6	16.7
	Rectum	8	22.2
First move	Administer the drug	24	66.7
	Health center	7	19.4
	Church	5	13.9

## Continued

<b>Physical means</b>	Undressing	12	33.3
	Wet wrap	24	66.7
<b>Antipyretic</b>	Ibuprofen	13	36.1
	Paracetamol	23	63.9
<b>Complications of fever</b>	Convulsion	10	27.8
	Death	6	16.7
	Delirium	12	33.3
	Dehydration	8	22.2
<b>(b) Attitude of mothers to fever</b>			
<b>Posture adopted</b>	Wait at home	8	22.2
	Go to the hospital	8	22.2
	Go to Pharmacy	20	55.6
<b>Preference for treatments</b>	Association	25	69.4
	Paracetamol	11	30.6
<b>Overdose for quick effect</b>	No	27	75.0
	Yes	9	25.0
<b>ATB use against fever</b>	No	19	52.8
	Yes	17	47.2
<b>Dosage adapted to weight</b>	No	1	2.8
	Yes	35	97.2
<b>(c) Practices of mothers in the face of fever</b>			
<b>Fever assessment tool</b>	Thermometer	11	30.6
	To touch	25	69.4
<b>Evaluation treatment</b>	More than 2 hours	19	52.8
	In an hour	17	47.2
<b>Instrument for calculating the dose</b>	Spoon	29	80.6
	Dosimeter	7	19.4
<b>Route of drug administration</b>	Oral	27	75.0
	Rectal	9	25.0
<b>ATB use without medical prescription</b>	No	12	33.3
	Yes	24	66.7

Of mothers' attitudes towards fever in children under five, 55.6% go to the pharmacy, 69.4% prefer to combine the antipyretic and the antibiotic, 75% maintain that an overdose makes it possible to obtain a quick effect of medication, 52.8% do not find the use of an antibiotic in case of fever and 97.2% are for a dose adapted to the weight of the child (**Table 2(b)**).

In their practices, more than half of the mothers assess the fever by touch (69.4%), they assess the effects of the intervention more than 2 hours later (52.8%),

use the teaspoon as a measuring instrument for calculating the dose (80.6%), give the medicine orally (75%) and use antibiotics without a doctor's prescription (66.7%) (Table 2(c)).

### 3.3. Correlates of Knowledge, Attitudes and Practices of Mothers Regarding Fever in Children under Five

The results in Table 3 show that mothers' attitudes towards fever in children under five years old were associated with level of education ( $p = 0.003$ ) and compliance with the vaccination schedule ( $p = 0.035$ ). As for the practices, they depended on the age of the mothers ( $p = 0.014$ ).

**Table 3.** Correlates of knowledge, attitudes and practices of mothers regarding fever in children under five.

Profile of mothers		Knowledge			Attitudes			Practice		
		Insufficient (n = 30)	Sufficient (n = 6)	p-value	Good (n = 8)	Bad (n = 28)	p-value	Good (n = 4)	Bad (n = 32)	p-value
<b>Age</b>	20 - 24	5	1	0.912	2	4	0.062	2	4	<b>0.014*</b>
	25 - 29	16	4		2	18		0	20	
	30 - 34	5	0		1	4		0	5	
	35 and over	4	1		3	2		2	3	
<b>Educational level</b>	Without level	9	1	0.620	0	10	<b>0.003**</b>	0	10	0.165
	Primary	8	1		0	9		0	9	
	Secondary	13	4		8	9		4	13	
<b>Access to media</b>	Never	5	0	0.836	0	5	0.732	0	5	1.000
	Sometimes	10	2		3	9		1	11	
	Every day	15	4		5	14		3	16	
<b>Number of children</b>	<3	28	5	0.431	6	27	0.118	3	30	0.305
	3 and more	2	1		2	1		1	2	
<b>Occupation</b>	Farmer	3	0	0.654	0	3	0.888	0	3	0.425
	Other	4	1		1	4		1	4	
	Trader	13	2		5	10		3	12	
	Household employee	1	1		0	2		0	2	
<b>Monthly income</b>	At least 10,000 FC	6	1	1.000	3	4	0.167	1	6	1.000
	Less than 10,000 FC	24	5		5	24		3	26	
<b>Mosquito net use</b>	No	17	1	0.177	3	15	0.691	1	17	0.603
	Yes	13	5		5	13		3	15	
<b>Recent illness</b>	Diarrhea	15	3	0.434	4	14	1.000	2	16	1.000
	Respiratory infection	1	1		0	2		0	2	
	Malaria	14	2		4	12		2	14	
<b>Schedule compliance</b>	No	14	2	0.672	1	15	<b>0.035*</b>	1	15	0.613
	Yes	16	4		7	13		3	17	

\*significant difference at the 0.05 level; \*\*significant difference at the 0.01 level.

### 3.4. Relationship between Level of Knowledge, Attitude and Practice Score of Mothers

Figure 1 presents the density of variables and Spearman's statistics. It is therefore a matter of correlation between these three variables. The regression line shows the direction of the relationship while the density gives an idea of the concentration of the data. The middle line is practice and knowledge, above it attitude and knowledge, then to the right practice and attitude. The first curve above indicates the distribution relating to knowledge, in the middle the attitudes and at the bottom on the x-axis the practice. It shows a positive correlation between the knowledge, attitudes and practices of mothers with  $r'$  of 0.397 and 0.413 ( $p < 0.01$ ). It also reveals a relationship between knowledge and attitudes of mothers ( $r' = 0.390$ ;  $p < 0.01$ ).

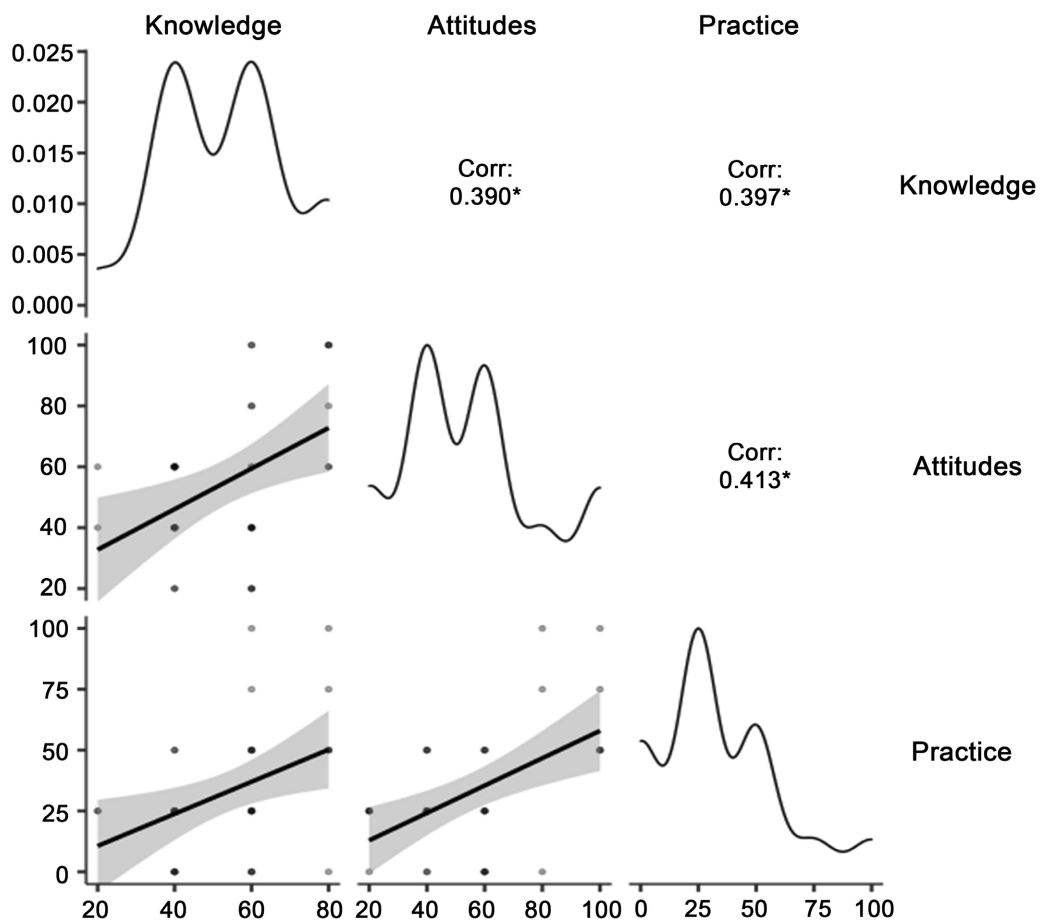


Figure 1. Correlation matrix.

## 4. Discussion

### 4.1. Socio-Demographic Characteristics of Mothers

The average age of the mothers who took part in this study was  $28.4 \pm 5.4$  years with a majority, *i.e.* 55.6%, in the 25 to 29 age group. Most of them, 47.2%, had secondary education, 52.8% had access to the media every day, 91.7% had less



than three children, 41.7% were women practicing small informal trade, 80.6% estimated their monthly income to be less than 10,000 Congolese francs (CFD), 50.0% used mosquito net, and 55.6% had respected the vaccination schedule.

Participants in the study by Shalam M. *et al.*, (2020) conducted at King Saud Hospital in Saudi Arabia had the mean age of 37.7 (SD = 10) years. More than 20% of parents had a university education. The majority (75%) had secondary education [4]. The data relating to age are therefore superior to ours, while the predominance in terms of level of education is identical in the two studies.

In Africa, the study by Eman H. *et al.*, (2022) on the “assessment of Egyptian mothers’ knowledge and home management practices of fever among preschool children in the city of Zagazig governorate of Sharkia” showed that 72.4% had more than 3 children [5]. This is contrary to our results.

#### 4.2. Mothers’ Knowledge of Fever in Children under Five

From their knowledge of fever, our study shows that the majority of mothers consider fever as an illness (94.4) which starts from 37.6° (58.3%). They believe that the best temperature sampling site is in the armpits (61.1%) and that the first action to take is the administration of medication (66.7%). The mothers know that we can use a wet wrap (66.7%), paracetamol as an antipyretic (63.9%) and 33.3% know that fever can lead to delirium.

Our results partially differ from those of Kelly *et al.*, (2016) on parental knowledge, attitudes and beliefs about fever in Ireland carried out on the sample of 1104 parents who showed that 63.1% had identified temperatures at which they define fever that were below or above the accepted definition of temperature (38°C) [6]. They go in the same direction as those of Hervouet who showed that only 56.4% of parents knew the temperature defining the fever (38°C) and 55.9% declared to have read the dedicated page of the health record [7]. They are also similar to those found by Sarah H. *et al.*, (2021) according to which, in the event of fever, more than half or 55% of parents administered paracetamol to children under 5 years old [8].

In addition, the work of Mohamed N. *et al.*, (2021) on the evaluation of the beliefs and behaviors of Saudi parents with regard to the management of childhood fever in Saudi Arabia showed that the majority of parents (79.7%) reported that most serious side effects of fever were seizures, followed by brain damage (39.3%), coma (29.9%), dehydration (29.7%) and death (25%) [8]. In the present study, these complications were also reported but with low proportions (delirium 33.3%; convulsions 27.8%; dehydration 22.2% and death 16.3%).

Mohamed, quoted above, adds that the majority of parents (78.4%) also used the cold sponge to treat fever. Results are slightly higher than ours showing a frequency of 66% in favor of this physical method of lowering fever.

#### 4.3. Attitudes of Mothers towards Fever in Children under Five Years Old

Our results reveal that of mothers’ attitudes towards fever in children under five

years old, 55.6% go to the pharmacy, 69.4% prefer to combine the antipyretic and the antibiotic, 75% maintain that the overdose makes it possible to obtain a rapid drug effect, 52.8% do not find the use of an antibiotic in the event of a fever and 97.2% are for a dose adapted to the weight of the child.

The study by Kelly *et al.*, (2016) had also shown that almost two out of three parents (64.6%) alternate between two fever medications to manage a child's fever [6].

In their study, Mohamed N. *et al.*, (2021) found that some parents (11.7%) believed that antibiotics should be prescribed to all children who develop fever, and 7.9% would insist on prescribing certain antibiotics to their feverish children [9].

#### 4.4. Mothers' Practices in Case of Fever in Children under Five

This study shows that in their practices, more than half of mothers assess fever by touch (69.4%), they assess the effects of the intervention more than 2 hours later (52.8%), use the spoon as a measuring instrument for dose calculation (80.6%), give the medicine by mouth (75%) and use antibiotics without a doctor's prescription (66.7%).

From the use of antibiotics, our results differ from those found by Shalam M. *et al.*, (2020) at King Saud Hospital in Saudi Arabia where only 15.7% of mothers claim to have used antibiotics to treat high fever without a prescription [4].

Discussion of the correlates of knowledge, attitudes and practices of mothers regarding fever in children under five

Our results show that mothers' attitudes towards fever in children under five years old were associated with level of education ( $p = 0.003$ ) and compliance with the vaccination schedule ( $p = 0.035$ ). As for the practices, they depended on the age of the mothers ( $p = 0.014$ ).

These results corroborate those obtained in recently published studies on this subject. Furthermore, the relationship between compliance with the vaccination schedule and the attitude of mothers towards fever in toddlers would indicate that the advice received by the latter during preschool consultations allows them to adopt a more responsible behavior vis-à-vis regarding this problem. In this case, they corroborate those found by Eman H. *et al.*, (2022) in their study on the "evaluation of Egyptian mothers' knowledge and household management practices of fever in preschool children of the city of Zagazig governorate of Sharkia" [5].

#### 4.5. Relationship between the Level of Knowledge, the Score of Attitudes and Practices of Mothers in the Face of Fever in Children under Five Years Old

This study shows a positive correlation between the knowledge, attitudes and practices of mothers with  $r'$  of 0.397 and 0.413 ( $p < 0.01$ ). This confirms the hypothesis that there are positive and significant relationships between knowledge, attitudes and practices in the face of fever and certain socio-demographic and

socio-economic characteristics.

## 5. Conclusions

This study, which aims to determine the level of knowledge, assess the attitudes and practices of these mothers in the face of fever in children under five, shows that mothers living in the Mabulu 2 quarter do not have sufficient knowledge of the fever. They have a litigious attitude and their practices in the face of children's fever are bad.

It is, therefore, useful to make them aware of fever in order to improve their knowledge, attitudes and practices when it occurs. Multiplying educational messages in favor of this phenomenon must be on the agenda of any worker wishing to contribute to improving the health of children under five who face this symptom on a daily basis.

Multicenter studies are also desired to draw important conclusions and adopt more appropriate strategies.

## Author Contributions

All the authors participated in the realization of the study. They have read and accepted the published version of the manuscript.

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## Conflicts of Interest

The authors declare that they have no conflict of interest.

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